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**Editorial**

*"Childhood SLE: Are We Addressing It Appropriately?"*



Bangladesh Institute of Child Health



Dhaka Shishu (Children) Hospital

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## EDITORIAL

# Childhood SLE: Are We Addressing It Appropriately?

Md. Jahangir Alam

Systemic lupus erythematosus (SLE) is a chronic multisystem autoimmune connective tissue disorder that manifests with a broad spectrum of clinical phenotypes. Approximately 20 % of SLE patients are diagnosed in childhood. The average age of onset of pediatric SLE is between 12 and 14 years and rarely before the age of 5 years. Childhood SLE is associated with greater lifetime morbidity and mortality than adult-onset SLE. SLE is thought to result from a combination of hormonal and environmental factors in a genetically predisposed individual. Systemic lupus erythematosus in children and adolescents (pSLE) may have a great variability in disease presentation and course. Any organ system can be involved in SLE, so the potential clinical manifestations are protean. They frequently present with systemic, constitutional symptoms such as fever, diffuse hair loss, fatigue, weight loss and diffuse generalized inflammation in addition to specific organ involvement. The manifestations of pSLE includes constitutional (Fever, malaise, weight loss), cutaneous (Butterfly rash, discoid lupus, periungual erythema, photosensitivity, alopecia, mucosal ulcerations), musculoskeletal (Polyarthralgia and arthritis, tenosynovitis, myopathy, aseptic necrosis), vascular (Raynaud's phenomenon, livido reticularis, thrombosis, erythromelalgia), Cardiac (Pericarditis and effusion, myocarditis), pulmonary (Pleuritis, basilar pneumonitis, atelactasis, hemorrhage.), gastrointestinal (Peritonitis, oesophageal dysfunction, colitis), hepatomegaly, splenomegaly, lymphadenopathy, neurologic (Organic brain syndrome, seizures, psychosis, chorea, cerebrovascular accident, polyneuritis and peripheral neuropathy, cranial nerve palsies, pseudo tumour cerebri.), ocular (Exudates, papilledema, retinopathy) and renal (Glomerulonephritis, nephrotic syndrome, uremia, hypertension).

Laboratory test serves as a diagnostic aid and to monitor disease activity. A complete blood count is needed to evaluate potential cytopenias. A comprehensive metabolic panel may reveal transaminitis, hypoalbuminemia, or an elevated creatinine level. Because most patients present with constitutional symptoms and inflammation, an elevated erythrocyte sedimentation rate is very common. Despite active inflammation, C-reactive protein levels can remain normal in pSLE; however, often these levels are elevated during active infection. A urinalysis should be performed to screen for proteinuria, hematuria, and other components of active urinary sediment. In SLE, there is production of myriad autoantibodies that recognize nuclear antigens, as well as many other cellular and tissue components. The ANA is found in 99% of patients with SLE, but also may be positive in other rheumatic diseases, such as mixed connective tissue disease and dermatomyositis. The ANA also may be positive in up to one-third of the healthy population and in family members of patients with SLE. It is helpful that a negative ANA makes the diagnosis of SLE extremely unlikely. ANA is not useful to monitor disease activity. A positive ANA therefore should be interpreted along with the clinical symptoms and having a definite diagnosis in mind. There is no level of ANA that is diagnostic for SLE, but higher levels, such as a titer of 1:1280 would be suspicious for SLE. The anti-dsDNA on the other hand is very specific for SLE and may be found in >75% of patients with pSLE.

The anti-dsDNA level usually is checked at the time of diagnosis and throughout the disease course to monitor disease activity. A high value in conjunction with other disease activity measures is suggestive of active SLE. The anti-Smith antibody and anti-ribonucleoprotein antibody often are ordered

together as an anti-extractable nuclear antigen panel. The anti-Smith antibody is highly specific for SLE and may be found in up to 50% of patients. This antibody may remain elevated regardless of disease activity and therefore is not useful in monitoring disease activity. The anti-ribonucleoprotein antibody may be found in patients who have classic SLE, but often indicates the patient's diagnosis is a mixed connective tissue disease (SLE with features of systemic sclerosis or dermatomyositis). Other antibodies can also be seen in SLE, such as SS-A (anti-Ro) and SS-B (anti-La). Complement levels, specifically C3 and C4, are monitored in SLE, and low or undetectable levels are expected in SLE during periods of active disease. The anti-dsDNA and complement levels are important disease markers and help to guide the dose of medication.

Physicians have commonly relied on the American College of Rheumatology (ACR) Criteria for the classification of SLE. These criteria were preliminarily developed in 1971, revised in 1982, and updated in 1997. A person can be classified as having SLE if at least four of the 11 criteria are present. In order to address limitations of the ACR criteria, the Systemic Lupus International Collaborating Clinics (SLICC) developed the SLICC Classification Criteria in 2012, which exhibited a higher sensitivity and lower specificity than the ACR criteria. The SLICC criteria include 11 clinical and six immunologic items. Classification criteria require four items with at least one clinical and one immunologic item, or biopsy-proven nephritis compatible with lupus in the presence of an ANA or anti-dsDNA. The SLICC criteria has been validated in children, showing better sensitivity and fewer misclassifications than the ACR criteria. Of note, these are no diagnostic criteria, and some patients need treatment despite not fitting classification criteria.

Management of pSLE is challenging. Proper addressing is very important for appropriate management of this diseases. General management and specific drug therapy both are important. This chronic disease have remissions and relapses and associated, with considerable morbidity and mortality. Treatment of SLE also itself is associated with morbidity, the effects of which may be short term or permanent. Barriers to treatment also present in this disease. Increasing knowledge of the pathogenesis of SLE and autoimmune processes will

help to target the new and innovative therapies.

Counseling the child and the family is the first and foremost important aspect of management.

Multidisciplinary approach is needed to provide best practices in the care of pSLE patients. Social and psychological problems, mood changes and depression, disease complications, or drug-related issues are common in teenagers with chronic diseases such as lupus, and require special attention by psychologists and social workers. Besides transition of care is an important time in a pSLE patient's life. The successful transition from pediatric to adult care for patients with chronic conditions is predicated on the ability of the individual to achieve self-efficacy and disease self-management skills as well as the ability of the medical system to provide patient-centered care.

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**SPECIAL ARTICLE**

# Approach to a Child with Joint Pain

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Joint pain is a common manifestation of rheumatologic diseases. It includes both benign and serious conditions. Joint pain may arise from structures within or adjacent to the joint or may be referred from distant sites. Sources of pain within the joint include the synovium, joint capsule, periosteum, ligaments and subchondral bone. Identification of the involved anatomic part of the joint is important as it guides the approach to diagnosis and therapy. Arthritis is manifested as a swollen joint and having at least 2 of the following conditions: limited range of motion, pain on movement, or warmth overlying the joint whereas arthralgia is pain without swelling.<sup>1</sup>

**Table I***Etiology of joint pain*

- Infection: arthritis (viral, septic, tubercular), osteomyelitis
- Trauma
- Acute rheumatic fever
- Rheumatological disorders: Juvenile idiopathic arthritis (JIA), Systemic lupus erythematosus (SLE), Dermatomyositis, Vasculitis, Kawasaki disease (KD), Henoch- Schonlein Purpura (HSP)
- Scurvy
- Blood diseases: Sickle cell anaemia, Hemophilia, Leukemia
- Reactive arthritis
- Malignancies
- Psychogenic

**Table II***Difference between inflammatory and non-inflammatory arthritis<sup>2</sup>*

	Inflammatory arthritis	Non-inflammtory/arthretis
Pain	Better with activity; Worst in morning	Worse with activity; improves with rest
Onset	Insidious	Sudden
Course	Fluctuant	Persistent
Early morning stiffness	>30min	15-30min
Swelling	Yes	May be
Warmth	Yes	No
Limited movement	Yes	May be
Systemic complaints	Yes, e.g. fatigue, poor appetite	No

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### Clinical approach

Children can present with joint pain in a number of conditions. Every arthritis has a specific pattern of target tissue involvement and joint distribution e.g. Juvenile idiopathic arthritis: symmetrical synovitis, Osteoarthritis: symmetrical pattern of hyaline cartilage degradation, Seronegative spondyloarthropathy: asymmetric inflammation of enthesis and synovium.<sup>3,4</sup> A detailed history and complete physical examination can provide clues to the underlying condition in most cases.

**Age:** Age of presentation gives important diagnostic clue. Septic arthritis is seen at any age. It is common in neonatal age to adolescence. HSP, KD, RA negative polyarticular JIA patients are commonly seen in early childhood. Transient synovitis, JDM, PAN, psoriatic arthritis patients are common in childhood. ERA, SLE, SCFE, RA positive polyarticular JIA patients are seen in adolescent age group. After first decade TB arthritis patients become symptomatic.

**Sex:** Sex preponderance is seen in rheumatological diseases. JIA is common in both sexes. Other forms of JIA (OJIA, PJIA), SLE has female preponderance. But ERA, PAN, KD, IBD associated arthritis (spondylitic group) are seen more in male patients.<sup>5</sup>

**Joint Pain:** History regarding joint pain should focus to differentiate arthritis and arthralgia first. Joint pain should enquired about characteristics, site, number, onset, duration, and progression. It is important to record the onset, site, character, radiation, and aggravating and relieving factors of pain.

**Onset:** May be acute or chronic. Acute onset (<2 weeks) is seen in infections, rheumatic fever, neoplasia, HSP, connective tissue diseases and mechanical joint pains, trauma or a bleeding diathesis. Subacute onset (2-6weeks): reactive arthritis, SLE, Dermatomyositis, PAN, leukemia, sickle cell disease, hemarthrosis. Chronic arthritis (>6 weeks): JIA, Tubercular, psoriasis. Juvenile Idiopathic Arthritis (JIA) and chronic infections start insidiously, have a variable course with remissions and exacerbations.

**Character:** Pain caused by inflammation is often present at rest and tends to vary in an unpredictable fashion with time. It flares up and then it settles down. Non-inflammatory joint pain is more directly

related to use. It gets worse with the use of joint. Severe bone pain is often unremitting and persists through the night, disturbing the patient's sleep.

**Stiffness:** Inflammatory arthritis is associated with morning stiffness. It is sometimes difficult for patients to distinguish between pain and stiffness. It is needed to remind the patient that stiffness means difficulty in moving the joint. The duration of the morning stiffness is a rough guide to the activity of the inflammation.

**Pattern of joint involvement:** It is important to look for number of joints affected, whether the large or small joints are involved, and whether the pattern is symmetrical or asymmetrical.

- Monoarticular: Tubercular, septic, monoarticular JIA, trauma.
- Pauciarticular (or oligoarticular): systemic disease. Migratory in rheumatic fever
- Polyarticular: Poly JIA, SLE.
- Small joints: JIA, Sickle cell disease (hand-foot syndrome), psoriatic arthritis, tubercular dactylitis.
- Large joints: most of the conditions.
- Axial: The spine is predominantly affected. Spondyloarthritides, such as ERA, psoriatic arthritis, are more likely to be asymmetrical and may be associated with inflammatory symptoms, such as early morning stiffness, involving the spine.

### History

#### History of Preceding Events

- Sore throat or Scarlet fever: Rheumatic fever.
- GI Symptoms: Reactive arthritis, GI infections like Salmonella or IBD.
- Urethritis: Reiter's disease.
- Viral infections: Rubella, mumps, chickenpox, IM, Hepatitis B Monoarticular synovitis.
- RTI
- Transient synovitis: Self-limiting, characterized by sudden onset pain in hips, thighs and knees.
- Pyoderma: Septic arthritis.
- Recent immunization: Rubella.
- Trauma: Septic arthritis, hemarthrosis, effusion, strained ligaments, sprained muscles, dislocation or fractures.

**Drug History**

- Penicillins, immunoglobulins.

**Antitoxins Relevant history****History of trauma, infection****Family History**

- IBD, psoriaticarthritis, uveitis, ankylosing spondylitis.<sup>6</sup>

**Involvement of other systems**

- Skin, eye, lung or kidney symptoms, malaise, weight loss, fevers, night sweats.

**Physical examination**

A brief screening examination, which takes 1-2 minutes, has been advised for use in routine clinical assessment. It involves inspecting carefully for joint swelling and abnormal posture. How the patient moves about in the room before and during the examination as well as during various maneuvers. Limb length, Pain, joint line tenderness and limitation of range of motion on both active and passive movement characterize articular disorders. Point tenderness are features of non-articular disorders.<sup>7</sup> Joints to be examined for whether it is arthralgia or arthritis.

**Look**

- Balance, posture, and gait pattern.
- Skin rashes, café-au-lait spots, hairy patches, dimples, cysts, tuft of hair, or evidence of spinal midline defects.
- General body habitus, including signs of cachexia, pallor, and nutritional deficiencies.
- Obvious spinal asymmetry, axial or appendicular deformities, trunk decompensation, and evidence of muscle spasm or contractures.
- The forward bending test is valuable in assessing asymmetry and movement of the spine.
- Any discrepancies in limb length
- Muscle atrophy.
- Range of motion of all joints, their stability, and any evidence of hyperlaxity.

**Feel and Move**

- Local temperature
- Tenderness
- Assessment for a swelling or mass and range of movement

- Spasticity
- Contracture
- Bone or joint deformity
- Evaluation of anatomic axis of limb
- Limb length, Pain, joint line tenderness and limitation of range of motion on both active and passive movement
- Single joint is affected or multiple.
- Large joint affected in lower extremities, i.e. knee, ankle: oligoarticular JIA.
- Small joints of upper and lower extremities: polyarticular JIA.
- Spindle shaped fingers: JIA.
- Diffuse swelling of entire dorsum of hand and foot: Sick cell disease.
- In TB hip joint: Limb will be flexed, abducted and medially rotated.
- Pseudoparalysis: inability to move joint due to severe pain: Septic arthritis, scurvy.

**Examination of spine**

- Kyphosis or scoliosis seen in TB spine.

**Examination of muscles**

- Wasting above or below the joint seen in idiopathic arthritis or chronic joint involvement (Disuse atrophy)
- Tenderness of muscles: Dermatomyositis

**Systemic Examination****Skin rash**

- Acute Rheumatic Fever: Erythema marginatum.
- SOJIA: Faint evanescent macular rash (salmon colored) is classic for SOJIA. These are linear or circular and are most commonly distributed over the trunk and proximal extremities, non-pruritic and migratory with lesions lasting for <1 hr.
- SLE: Typical butterfly shaped malar rash that spares nasolabial fold.
- HSP: Palpable purpuric rash over the extensor aspect of extremities.
- Juvenile Dermatomyositis: Heliotrope rash over upper eyelids.
- Leukemia: Purpuric and ecchymotic patches.
- Rheumatic fever: Subcutaneous nodules over extensor aspect of upper extremities and sub-occipital region.

**Eyes**

- Pallor and jaundice Iridocyclitis: JIA
- High fever with conjunctival injection: Kawasaki disease.

**Oral cavity**

- Spongy gums - Scurvy.
- Swollen tongue and lips - Kawasaki disease.
- Desquamation of fingers: Kawasaki disease.

**Organomegaly**

- Hepato-splenomegaly: collagen diseases, leukeamias, disseminated TB.
- Splenomegaly: Sickle cell disease.

**Focus of infection**

- Boils, abscesses, etc. could lead to septic arthritis

**CVS**

- Hypertension: SLE
- Pericardial rub/ Pericarditis: SOJIA, SLE
- Myocarditis: Rheumatic Fever and Kawasaki disease.

pGALS (pediatric GALS) is a modification of 'GALS' for use in school-aged children.

**The components of pGALS screen are as follows<sup>8</sup>**

**Screening questions:**

- a) Pain and stiffness in joints, muscles or back
- b) Difficulty in dressing oneself and
- c) Difficulty in going up and down stairs.

**Gait:**

- a) Observing the child walking
- b) Asking the child to walk on tip-toes and heels.

**Arms:**

- a) Moving hands in different directions
- b) Making a fist
- c) Touching fingertips with thumb
- d) Squeezing metatarso-phalangeal joints.

**Legs:**

- a) Bending and straightening knees
- b) Passive flexion and extension of hip
- c) Feel for knee effusion.

**Investigations**

No screening test is ideal for detecting rheumatic diseases; diagnosis depends on appropriate history and thorough physical examination. Sometimes, laboratory investigations may be useful in confirming or ruling out rheumatic disease after a clinical

diagnosis is suspected.<sup>9</sup>A number of radiographic findings are characteristic of specific rheumatic disorders. For instance, sacroiliitis is indicative of ankylosing spondylitis, erosions with periarticular osteopenia are typical of JIA, and "pencil-in-cup" deformities are a sign of psoriatic arthritis. However, these radiographic findings take months to develop; early in the process, radiographs may be normal or show only nonspecific changes. Ultrasound or MRI is advised for deep, inaccessible joints.

**CBC**

- In Sickle cell disease and leukemia Hb would be low.
- Septic arthritis - Leukocytosis with polymorphonuclear predominance
- SLE - Leukopenia with Lymphopenia.
- Reticulocyte count - Increased in Sickle cell disease.
- Thrombocytopenia - Leukemia, SLE
- Thrombocytosis - Idiopathic arthritis.
- HSP - Platelet count will be normal.
- Anaemia of chronic disease - Collagen vascular diseases, TB.<sup>10</sup>

**ESR and CRP**

- Increased in collagen diseases and acute rheumatic fever. Decreased in Sickle cell anemia.<sup>1,10</sup>

**Serology**

- RA Factor: in Polyarticular JIA.
- ANA seropositivity: increased risk of chronic uveitis in JIA.
- Anti dsDNA: highly specific of SLE.
- ASO Titer: rising titer in rheumatic fever indicates recent streptococcal infection.
- CRP: raised in acute rheumatic arthritis.<sup>11,12</sup>

**Throat swab culture**

- For isolation of beta hemolytic streptococci in rheumatic arthritis.

**Urine examination**

- For albumin and hematuria in cases of collagen disease.

**Synovial fluid aspiration**

- For microscopy and culture in septic arthritis.

**Synovial fluid analysis<sup>13</sup>**

USG and MRI

1. In septic and tubercular arthritis, hemarthrosis.<sup>14</sup>
2. Others:
  - Estimation of clotting factors: when there is hemarthrosis with prolonged clotting time.
  - Mantoux test: suspected case of TB.

**Table III**  
*Analysis of Synovial Fluid*

Categorization	White blood cell count	Polymorphonuclear neutrophilic leukocytes	Examples
Normal	0 to 200 per mm <sup>3</sup> (0 to 0.2 × 10 <sup>9</sup> per L)	< 25% (0.25)	—
Non-inflammatory	< 2,000 per mm <sup>3</sup> (2 × 10 <sup>9</sup> per L)	< 25% (0.25)	Osteoarthritis, internal derangement
Inflammatory	2,000 to 50,000 per mm <sup>3</sup> (2 to 50 × 10 <sup>9</sup> per L)	>75% (0.75)	JIA, psoriatic arthritis, <i>Neisseria gonorrhoeae</i> infection
Septic	> 50,000 per mm <sup>3</sup> (50 × 10 <sup>9</sup> per L); usually > 100,000 per mm <sup>3</sup> (100 × 10 <sup>9</sup> per L)	Usually > 90% (0.90)	Septic arthritis (primary concern); occasionally, gout, reactive arthritis, Lyme disease

### Conclusion

In rheumatology, a careful clinical history and examination provide the most useful information in assessing a patient. Patients presenting with joint pain, such assessment is invaluable in moving forward with a management plan. There will always be patients in whom there remains significant doubt. We should keep in mind to examine the whole patient, identify the target tissue and joint distribution, recognize synovitis, and interpret laboratory studies in the context on the clinical picture.

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ORIGINAL ARTICLE

# Predictors of Mortality of Neonates Referred to a Tertiary Care Hospital

Madhabi Baidya<sup>1</sup>, Mahfuza Shirin<sup>2</sup>, Liton Chandra Saha<sup>3</sup>

## Abstract

**Background:** Neonatal period, the period during first four weeks of life, carry one of the highest risks of death in the history of human life. Every year all over the world, 130 million babies are born and about 4 million babies among them die in the first four weeks.

**Objective:** The present study was done to find out predictors of mortality of neonates referred to a tertiary care hospital.

**Methods:** This cross sectional study was conducted in Dhaka Shishu (Children) Hospital from June 2013 to November 2013. Both term and preterm neonates who were referred within first seven days of life were included and those with gross congenital abnormalities and left against medical advice were excluded from the study. After enrollment data was collected using a structured questionnaire including birth details, clinical parameters of neonates on arrival at hospital, duration of hospital stay and outcome. For analysis of data SPSS 16.0 was used. The study variables were analyzed for their association with immediate outcome by applying chi-square test and t test. P value <0.05 was considered statistically significant. Relative risk (RR) was calculated. Multiple logistic regression analysis was done for their possible independent association.

**Results:** This study found that out of 332 neonates 181 were expired with 54.5% mortality rate. One eighty one neonates who were expired, considered as group I and one fifty one neonate were survived, considered as group II. The mortality was significantly high in male neonates [RR 0.80 (0.66-0.97)] and neonates those delivered at home [RR 1.34(1.10-1.64)] ( $p < 0.05$ ). Asphyxia, pre-term low birth weight, neonatal sepsis were the main causes of referral. It was found that respiratory distress [RR 1.33 (0.99-1.78)], hypothermia [RR 1.26(1.04-1.54)], prolonged capillary refilling time ( $\geq 3$  sec) [RR 1.47(1.22-1.77)], SPO<sub>2</sub> without O<sub>2</sub> ( $\leq 90\%$ ) [RR 0.50(0.39-0.65)] and hypoglycemia [RR 2.58(1.69-3.94)] at the time of admission ( $p < 0.05$ ) were significantly associated with mortality of referred neonates. Multiple regression analysis found that male neonates, hypoglycemia and poor oxygenation (SPO<sub>2</sub> without O<sub>2</sub>  $\leq 90\%$ ) were significant predictors of mortality.

**Conclusions:** This study found that male neonates, home delivery, hypoglycemia, hypothermia, respiratory distress, poor perfusion and poor oxygenation (SPO<sub>2</sub> without O<sub>2</sub>  $\leq 90\%$ ) were significant predictors of mortality of referred neonates.

**Key words:** Mortality, neonate, referral, tertiary hospital.

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## Introduction

Globally there has been a considerable decline in under five and infant mortality in the past two decades. Worldwide four million infant die in the first 28 days of life. Three quarters of neonatal death occur in the first week and more than one quarter occurs in the first 24 hours. There are highly feasible and cost-effective interventions that could avert up to 72% of neonatal deaths, but this can only be achieved if countries adopt locally relevant and focused interventions that are guided by evidence.<sup>1</sup> Data from 2014 BDHS shows that under 5 mortality in the five years preceding the survey is 46 per 1000 live births. Bangladesh has achieved its Millennium Development Goal (MDG) 4 target for under five mortality (48 per 1000 live birth by 2015) ahead of time. The infant mortality rate is 38 per 1000 live births. During infancy, the risk of dying in the first month of life (28 deaths per 1000 live births) is nearly three times greater than the subsequent 11 months (10 deaths per 1000 live births). It is also notable that deaths in the neonatal period account for 61 percent of all under 5 deaths.<sup>2</sup> Neonatal mortality and disease pattern is a sensitive indicator of availability, utilization and effectiveness of mother and child health services in the Community.<sup>3</sup> Birth asphyxia (23%), prematurity/low birth weight (45%), severe infection (20%), diarrhea 1%, and others (4%) were the major direct causes of death.<sup>4</sup> since causes of neonatal death vary by country with the availability and quality of health care, understanding neonatal mortality in relation to these factors is crucial. Many of these are easy to manage and significantly decrease in neonatal mortality can be anticipated with regionalization of perinatal care, where many sick newborn can be provided with better care and outcome if they are timely referred in stable condition.<sup>5</sup> The present study is undertaken to identify the predictors of mortality among the neonates referred in a tertiary hospital.

## Materials and Methods

This was a cross sectional study, conducted in Dhaka Shishu (Children) Hospital from June 2013 to November 2013. Both term and preterm neonates who referred within first seven days of life were included in this study. Neonates with gross congenital abnormalities and left against medical advice were excluded. The study was conducted by obtaining ethical clearance from Ethical Committee of Bangladesh Institute of Child Health, Dhaka Shishu

(Children) Hospital. Before data collection informed written consent was taken from respondents. Data was collected by purposive sampling method and the subjects were assessed in term of age, gender, weight on admission, birth details, socioeconomic status, condition of the neonates on arrival at hospital and causes of referral were recorded. Gestational age was calculated as total duration of pregnancy in weeks from the first date of the last menstrual period to birth of the baby and validity by doing New Ballard scoring. Weight was obtained by digital weight machine to the nearest 10 g. Initial investigations of subjects including blood glucose by heel prick after admission and oxygen saturation (SPO<sub>2</sub>) was done pulse oxymetry. One eighty one neonates who were expired, considered as group I and one fifty one neonate were survived, considered as group II. Data was collected using a structured questionnaire (research instrument) containing all the variables of interest. Statistical analysis was carried out by using the Statistical Package for Social Sciences version 16.0 for Windows (SPSS Inc., Chicago, Illinois, USA). The study variables were analyzed for their association with immediate outcome by applying chi square test and t test. P value less than 0.05 was considered significant. Relative risk (RR) was calculated. Variable that was found significant on chi-square test was further analyzed using logistic regression analysis for their possible independent association.

## Results

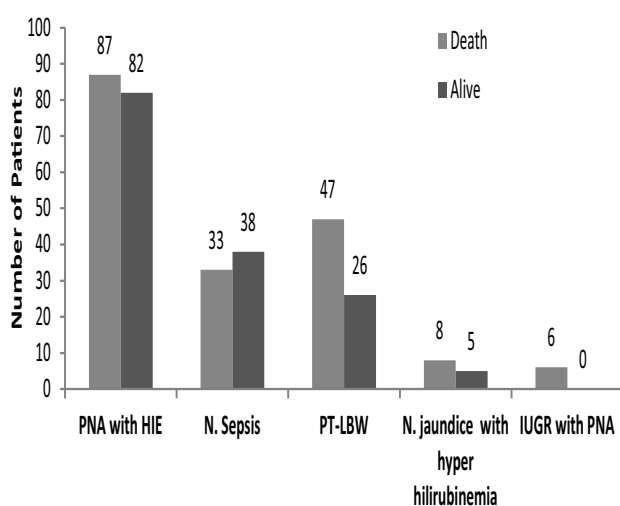
A total of 385 neonates were screened among them 53 neonates were excluded and finally data of 332 neonates were analyzed. Out of 332 neonates 181 neonates were expired with 54.5% mortality rate. One eighty one neonates who were expired, considered as group I and one fifty one neonate were survived, considered as group II.

The mortality was significantly high in male neonates [RR 0.80 (0.66-0.97)] and neonates those delivered at home [RR 1.34(1.10-1.64)] ( $p < 0.05$ ). The mean admission weight were  $2.2 \pm 0.6$  Kg and  $2.3 \pm 0.6$  Kg in group I and group II respectively, term neonates were more than preterm neonates, there was no significant difference in mortality in between them (Table I). Common indications for referral were perinatal asphyxia followed by neonatal sepsis, pre-term low birth weight respectively (Fig 1).

**Table I**  
General characteristics of referred neonates on arrival at hospital (n= 332)

General characteristics	Group I n (%)	Group II n (%)	RR	95% CI		P value
				Lower	Upper	
Gestation						
Term	119 (65.7%)	100(66.2%)	1.01	0.82	1.24	0.926*
Pre-term	62(34.3%)	51(33.8%)				
Gender						
Male	89 (49.2%)	56(37.1%)	0.80	0.66	0.97	0.027*
Female	92 (50.8%)	95(62.9%)				
Residence						
Urban	80 (44.2%)	73 (48.3%)	0.93	0.76	1.13	0.450*
Rural	101 (55.8%)	78 (51.7%)				
Place of delivery						
Home	100 (55.2%)	59 (39.1%)	1.34	1.10	1.64	0.003*
Hospital/clinic	81 (44.8%)	92 (60.9%)				
Socio economic status						
Poor /Below avg.	100 (55.3%)	73 (48.3%)	0.93	1.38	0.209*	
Average	81 (44.7%)	78 (51.7%)				
Admission weight						
< 1.5	30 (16.6%)	18 (11.9%)				
1.5-2.5	111 (61.3%)	93 (61.7%)				
> 2.5	40 (22.1%)	40 (26.4%)				
Mean ±SD	2.2±0.6	2.3±0.6				0.131#

RR= relative risk; CI = confidence interval; # = t test; \* =  $\chi^2$  test ;



**Fig 1** Causes of referral

It was observed that mortality was significantly high in neonates who had respiratory distress [RR 1.33 (0.99-1.78)], hypothermia [RR 1.26(1.04-1.54)], prolonged capillary refilling time ( $\geq 3$  sec) [RR 1.47(1.22-1.77)], SPO<sub>2</sub> without O<sub>2</sub> ( $\leq 90\%$ ) [RR 0.50(0.39-0.65)] and hypoglycemia [RR 2.58(1.69-3.94)] at the time of admission (p < 0.05) (Table II). To adjust for confounders, factors found to be significant on univariant analysis were extend into a logistic regression model. Independent predictors of mortality were male neonates, SPO<sub>2</sub>  $\leq 90\%$  without O<sub>2</sub> and hypoglycemia (Table III).

It was observed that more than three fourth (75.7%) of patients had hospital stay of >8 hours in group I and 139(92.1%) in group II. Mean was found 33.4±27.4 in group I and 122.6±65.6 in group II.

**Table II**  
*Clinical and biochemical variable at time of admission (n=332)*

Clinical and biochemical Variable	Group I (n=181)		Group II (n=151)		RR	95% CI	P* value
	n	%	n	%			
Respiratory distress	152	84.0%	113	74.8%	1.33	(0.99 - 1.78)	0.038
Cyanosis	92	50.8%	79	52.3%	0.97	(0.80 - 1.18)	0.786
Hypothermia	59	32.6%	33	21.9%	1.26	(1.04 - 1.54)	0.006
CRT $\geq$ 3 sec	81	44.8%	37	24.5%	1.47	(1.22 - 1.77)	0.001
SPO <sub>2</sub> $\leq$ 90% without O <sub>2</sub>	138	76.2%	67	44.4%	0.50	(0.39 - 0.55)	0.001
Hypoglycemia	164	90.6%	98	64.9%	2.58	(1.69 - 3.94)	0.001

\* =  $\chi^2$  test

**Table III**  
*Multivariable logistic regression analysis (n=332)*

Variable	Odds		95% CL	
	ratio	Sig	Lower	Upper
Gestation	1.606	0.182	0.801	3.219
	0.999	0.300	0.00	0.00
Sex	0.358	0.002	0.186	0.687
Residence	0.629	0.179	0.320	1.237
Home delivery	0.786	0.467	0.411	1.503
Socio economic status	0.673	0.201	0.367	1.234
Respiratory distress	1.574	0.253	0.723	3.427
Cyanosis	1.142	0.101	0.625	2.086
Hypothermia	1.141	0.710	0.569	2.291
CRT ( $\leq$ 3 sec)	0.555	0.101	0.274	1.123
SPO <sub>2</sub> without O <sub>2</sub> ( $\leq$ 90%)	3.339	0.001	1.594	6.993
Hypoglycemia	0.061	0.000	0.027	0.134

## Discussion

As most of the deaths in infancy take place within first 28 days, emphasis on neonatal care very much require in today's perspective. The present study provides insight into neonatal health in a tertiary care hospital.

Total 332 neonates were enrolled, among them 181 expired with 54.5% mortality rate. Narang et al<sup>6</sup> reported proportion of children who expired was 46.3%, which was nearer to this study findings. But study conducted by Buch et al<sup>5</sup> revealed overall mortality of referred neonates was 32.2% and Shegal et al<sup>7</sup> demonstrated that only 19.5% referred newborns were expired. Both of these findings were less than that of our findings.

In this present study, it was observed that male neonates and home delivery was significantly more in group I. Rakholia et al<sup>6</sup>, found that more male babies (63.25%), and 53.54% were out born which was similar to our findings. Narang et al<sup>7</sup> found only 24.3% neonates were born by home delivery, which was not like of this study. Buch et al<sup>5</sup> reported that weight less than 1500 gm, pre-maturity  $<$ 32 weeks were significant predictors of neonatal death but in our study gestational age and weight were similar in two groups, they were not significantly related to mortality. Probable cause of such different as we collected data by purposive sampling and data collection was done about 14 hour time in a day and

a group of neonates were out of reach of screening, probably this is one of the reason.

Prematurity, asphyxia and sepsis are the most common causes of neonatal mortality in developing countries.<sup>9</sup> Many of these are easy to manage and significant decrease in neonatal mortality can be anticipated with regionalization of perinatal care, where many sick newborn can be provided with better care and outcome if they are timely transported in stable condition. Individual morbidity and cause for mortality have not changed in developing countries though many of them can be managed properly. Birth asphyxia, Hyaline membrane disease (HMD), Sepsis and Meconium aspiration syndrome were most common morbidity among multiple co-morbidities. Incidence of sepsis and HMD among preterm and LBW babies are the major causes for immediate adverse outcome in developing countries of Asia and Africa.<sup>8-9</sup>

In this present study it was observed that neonates were referred due to Perinatal asphyxia, N. Sepsis, Pre term-Low birth weight, Neonatal jaundice with hyperbilirubinemia, and IUGR with perinatal asphyxia. Mortality was significantly ( $p=0.031$ ) high among the referred neonates with perinatal asphyxia, pre term-low birth weight and IUGR with PNA. These observations were similar to those of Rakholia et al.<sup>8</sup> Narang et al<sup>6</sup> and Kazemian et al.<sup>10</sup> In this present study it was observed that among the clinical and biochemical parameters on arrival at the hospital respiratory distress (RR: 0.267, [95% CI]: 0.29% to 3.61%), hypothermia (RR: 0.095, [95% CI]: 0.53% to 1.71%), CRT  $\geq 3$  sec, (RR:1.306, [95% CI]: 2.73% to 6.31%), SPO<sub>2</sub> without O<sub>2</sub> (RR: 0.059, [95% CI]: 0.17% to 0.20%), and hypoglycemia (RR: 2.129, [95% CI]: 0.59% to 9.28%), were found significantly related to mortality but clinically observed cyanosis was not significantly related to mortality of referred neonates. A better condition on arrival was reported by Narang et al<sup>6</sup>, where they showed that 53.0% of neonates had normal temperature, rest had temperature between 36.5-32°C and none of the neonates were severely hypothermic (<32°C). Only 29.6% of admitted neonates were hypoglycemic (<40 mg/dl) and hypoxemia (SpO<sub>2</sub>  $\leq 90\%$ ) was seen in 32.6% of neonates, but 69.3% neonates had prolonged capillary refill time (>3 sec) at admission.

This study found that the predictor of mortality of referred neonates to a tertiary care hospital were hypoglycemia (RR: 2.129, [95% CI]: 0.59% to 9.28%, Capillary refilling time (CRT)  $\geq 3$ sec (1.306 times with 95% CI 2.73% to 6.31%), respiratory distress (0.267 times with 95% CI 0.20% to 3.61%), hypothermia (0.095 times with 95% CI 0.53% to 1.71%) and oxygen saturation (SPO<sub>2</sub>) without O<sub>2</sub>  $\leq 90\%$  (0.059 times with 95% CI 0.17% to 0.20%).

Buch et al<sup>5</sup> reported that delayed capillary refilling time, respiratory distress were significant predictors of neonatal death. Narang et al<sup>6</sup> observed that the common factors determining the outcome were deranged physiological factors e.g., hypothermia, respiratory distress, prolonged capillary refilling time (CRT) and central cyanosis. Another study reported that the significant contributory factors to mortality were lower birth weight, pre maturity, hypothermia, hypoglycemia, poor perfusion. Hypoglycemia and prolonged capillary filling time had the highest odds for mortality. All of these studies reflect the findings of current study.

### Conclusion

This study found that the significant mortality contributory factors were male neonates, home delivery, hypothermia, hypoglycemia, respiratory distress, poor perfusion (CRT  $\geq 3$  sec) and poor oxygenation (SPO<sub>2</sub> without O<sub>2</sub>  $\leq 90\%$ ). However male neonates, hypoglycemia and poor oxygenation (SPO<sub>2</sub> without O<sub>2</sub>  $\leq 90\%$ ) were significantly associated with mortality in multivariate logistic regression analysis.

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## ORIGINAL ARTICLE

# Outcome of Preterm Neonates Presented with Respiratory Distress in a Tertiary Care Hospital of Bangladesh

Liton Chandra Saha<sup>1</sup>, Probir Kumar Sarkar<sup>2</sup>, Maksudur Rahman<sup>2</sup>, Madhaby Baidya<sup>3</sup>, MAK Azad Chowdhury<sup>4</sup>

### Abstract

**Background:** Respiratory distress is one of the most common causes of admission in Neonatal Intensive Care Unit (NICU) and Special Care Baby Unit (SCABU). It is a main cause of neonatal morbidity and mortality in developing countries. Early detection of its risk factors and early treatment of its etiologies are major challenges.

**Objective:** We aimed to determine the frequency, etiology and outcome of respiratory distress in neonates in NICU and Neonatal ward.

**Methods:** This descriptive cross-sectional study was conducted at the Neonatal Intensive Care Unit (NICU) and Special Care Baby Unit (SCABU) of Dhaka Shishu(Children) Hospital, Bangladesh from January 2016 to July 2016. The preterm (<37wks) neonates were screened first for respiratory distress and presence of one or more signs and symptoms. History, examination and investigations were carried out to find out various etiologies of respiratory distress.

**Results:** Of the 172 neonates in the study, 89(51.7%) were male and 83(48.3%) were female. The mean age of the neonates was 30.14( $\pm$ 16.657) hours, the mean gestational age was 30.80( $\pm$ 1.789) weeks and the mean weight was 1445( $\pm$ 265) gms. Respiratory rate >60/min was found in 135(78.48%) neonates. In terms of signs and symptoms, 103(59.9%) had grunting, 99(57.6%) had subcostal retractions and nasal flaring was in 103(59.9%). Etiologies observed were birth asphyxia, RDS, pneumonia with or without sepsis, TTN and MAS in 64(37.20%), 37(42.40%), 31(18%), 24(14%) and 11(6.4%) neonates respectively.

**Conclusion:** Respiratory distress in preterm neonate is a common emergency and causes high morbidity and mortality. Most of its risk factors and etiologies are preventable. Adequate follow-up of pregnancy and labor for timely intervention may improve the neonatal outcomes.

**Keywords:** Preterm, Neonates, Respiratory distress, outcome, etiology.

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## Introduction

Respiratory distress is one of the most common problems presented within the first few days of life.<sup>1,2</sup> Respiratory distress in the newborn may present as tachypnoea (more than 60 breaths per minute), cyanosis, grunting, inspiratory stridor, nasal flaring, poor feeding, apnoea and intercostal, subcostal or supracostal recessions.<sup>3</sup> The incidence of neonatal respiratory distress is ranging from 2.2% to 7.6% in developed countries and from 0.7% to 8.3% in India.<sup>4</sup> Neonates with respiratory distress are 2-4 times more likely to die than those without respiratory distress so its prevention and adequate management will decrease mortality.<sup>5</sup> Decreased gestational age predisposes to respiratory distress. Other risk factors include increasing number of Caesarean section, meconium-stained amniotic fluid, gestational diabetes, maternal chorioamnionitis, or prenatal ultrasonographic findings, such as oligohydramnios or structural lung abnormalities.<sup>6</sup> Fifteen percent of term infants and 29% of late pre-term infants admitted to the neonatal intensive care unit (NICU) develop significant respiratory morbidity; this is even higher for infants born before 34 weeks' gestation.<sup>7</sup> In newborn infants, it may have either pulmonary or extra-pulmonary causes.<sup>8</sup> The principles of care are the same, irrespective of the cause of the respiratory distress. So, it is important to recognize and manage it quickly, otherwise it may lead to respiratory failure and cardiopulmonary arrest. Respiratory distress being a symptom complex represents a heterogeneous group of illness with varying incidence, aetiology, clinical causes and outcome.<sup>9</sup> Early detection of its risk factors and anticipation of the management of its etiologies are imperative.<sup>10,11,12</sup> A remarkable decrease in the newborn respiratory distress specific mortality rate has occurred over the past six decades in high-income countries<sup>12-14</sup> due to several innovations in neonatology that are insufficient or non-existent in low-income countries.<sup>10,11,15</sup> However, there have been gradual improvements in health infrastructures and level of care in Bangladesh over time, yet to the best of our knowledge no well-designed and large-sample study has focused on respiratory distress in newborn in the recent years. We aimed to determine the etiologies and outcome of respiratory distress in newborn in NICU and Neonatal ward of Dhaka Shishu Hospital.

## Materials and Methods

This descriptive cross-sectional study was conducted at the Neonatal Intensive Care Unit and Neonatal ward of Dhaka Shishu (Children) Hospital,

Bangladesh, from January 2016 to July 2016 and comprised neonates selected through consecutive sampling. All neonates from birth to 7 days of life belonging to either gender and admitted to the NICU and Neonatal ward with gestational age <37 wks were included. Neonates developing respiratory distress postoperatively, syndromic neonates, neonates with congenital anomalies and newborns whose parents refused to be admitted to the study were excluded. All neonates referred in the NICU and Neonatal ward were seen and a written informed consent was taken from the parents concerned. Finally, neonates were screened for respiratory distress which was defined as presence of one or more of following clinical features: respiratory rate >60 breaths/minute, chest wall retraction, grunting, nasal flaring and cyanosis. Outcome was measured in terms of discharged i.e. fully recovered in terms of improvement in signs and symptoms, and the presence of all of the following: No sign of respiratory distress, oxygen (O<sub>2</sub>) saturation >95% in room air measured by pulse oximeter, and able to breast feed. History, examination and investigations were carried out to find out various etiologies of respiratory distress. The neonates were labeled as RDS if they developed respiratory distress within six hours and chest X-ray showed one or more of the following; poor expansion with air bronchogram, reticulo-granular pattern and ground glass opacity. Neonates develop respiratory distress immediately after birth and chest X-Ray showing one or more of following; hyperinflation, prominent perihilar marking and interlobar fissure oedema, were labelled as TTN. MAS was labeled when neonates had meconium staining of one or more of the following: Liquor, nails, umbilical cord and skin, with X-Ray chest showing emphysematous changes and bilateral patchy infiltrates with atelectasis.

Neonates having history of lethargy or poor feeding and complete blood count (CBC) showing total leukocyte count (TLC) either >30,000 or <5000 per  $\mu$ l were labeled as Sepsis. Pneumonia was labelled to those neonates who developed respiratory distress at any age during neonatal period with chest X-ray showing bilateral patchy opacities. Neonates having history of delayed cry, low Apgar score <3 for 5 minutes and ABGs showing acidosis with PH <7.0 were labelled as having birth asphyxia. Standard care with frequent monitoring was done and when required Bubble CPAP or ventilatory support was given to all neonates. Patients were discharged when they had no sign of respiratory distress, O<sub>2</sub> saturation >95% on room air and taking mother feed more than

4 times per day. The principal investigator examined selected cases of respiratory distress on a regular basis and out come in terms of either discharge or death were noted. Data entries were made into a specially designed proforma. Data was analysed through SPSS 15. Frequencies and percentages were calculated for all qualitative/categorical variables including gender, outcomes (Discharge or Death) and aetiologies (RDS, Pneumonia with sepsis, MAS, TTN, and Birth asphyxia). Mean values were computed for age, weight, age of onset of respiratory distress and gestational age.

## Results

Of the 615 patients screened, 172(27.97%) met the inclusion criteria. Of the 172 neonates in the study, 89(51.7%) were boys and 83(48.3%) were girls. The mean age of the neonates was 30.14( $\pm$ 16.657) hours, the mean gestational age was 30.80( $\pm$ 1.789) weeks and the mean weight was 1445( $\pm$ 265) gms. Regarding maternal history, with hypertension 15(8.7%), DM 13 (7.6), taking antinatal steroids 28(16.27) and fetal distress 70 (40.7%). 117 (68%) babies delivered in hospital and delivered by NVD 55y (38.4%) [Table-I].

Characteristics	No.	%
Sex		
Male	89	51.7
Female	83	48.3
Baby		
Age in hrs (Mean $\pm$ SD)	30.14( $\pm$ 16.657)	
Gestational age in Wks (Mean $\pm$ SD)	30.80( $\pm$ 1.789)	
Weight In gms (Mean $\pm$ SD)	1445( $\pm$ 265)	
Maternal history		
Hypertension	15	8.7
DM	13	7.6
PROM >18 hrs	45	26.2
Taking antinatal steroids	28	16.27
Fetal distress	70	40.7
Mode of delivery		
Caesarean section	106	61.6
Vaginal delivery	66	38.4
Place of delivery		
Hospital	117	68
Home	55	32

DM - Diabetes mellitus

PROM - Premature rupture of membranes

Respiratory rate >60/min was found in 165(95.93%) neonates, while 103(59.9%) had grunting, 99(57.6%) had subcostal retractions and nasal flaring was in 103(59.9%) (Table-II). Aetiologies observed were birth asphyxia, RDS, pneumonia with or without sepsis, TTN and MAS in 64(37.20%), 37(42.40%), 31(18%), 24(14%) and 11(6.4%) neonates respectively (Table-III).

Features	Number	%
Fast breathing (>60/min)	165	95.93
Chest indrawing	99	57.6
Grunting	103	59.9
Nasal flaring	103	59.9

Etiology	Number	%
Perinatal asphyxia	64	37.2
RDS	42	24.4
Pneumonia with sepsis	31	18
TTN	24	14
MAS	11	6.4

TTN: Transient tachypnoea of newborn.

MAS: Meconium aspiration syndrome.

RDS: Respiratory distress syndrome.

In total, 135(78.5%) neonates were discharged, while 37(21.50%) expired (Table- IV). The mean duration of oxygen need was 7.07 ( $\pm$ 2.935) days, mean duration to improve respiratory distress and hospital stay was 5.70 ( $\pm$ 2.997) and 10.73 ( $\pm$ 8.953) days respectively (Table- IV).

Features	(Mean $\pm$ SD)
Duration of O <sub>2</sub> Need (Days)	7.07 ( $\pm$ 2.935)
Duration to improve respiratory distress (Days)	5.70 ( $\pm$ 2.997)
Hospital say in Days	10.73 ( $\pm$ 8.953)
Need for mechanical ventilation (NO./%)	43 (25%)
Improved and discharged (NO./%)	135 (78.5%)
Died (NO./%)	37 (21.5%)

## Discussion

The importance of respiratory distress in neonates can be realized from the fact that the neonates with respiratory distress are 2-4 times more likely to die than those without respiratory distress.<sup>16</sup> Knowledge of the causes of respiratory distress is important for planning and provision of basic facilities for sick and low birth weight newborns.<sup>17</sup>

The spectrum of causes of respiratory distress in neonates includes several clinical conditions. In the present study, perinatal asphyxia (37.2%) was the most common cause of respiratory distress. Pneumonia with sepsis was the 3<sup>rd</sup> most common causes of respiratory distress in the neonates (18%). The frequency of neonatal sepsis and pneumonia was almost equal compared to earlier reports (18.7% and 25%).<sup>1,2,8</sup> The difference may have been due to the unhygienic settings and deliveries by untrained persons or transportation from hospitals with inadequate hygienic precautions. Earlier studies of neonates with respiratory distress<sup>1,2,8,18</sup> comprised neonates which were delivered in hospital by trained personnel and were provided with continuous care since birth. Especially while 40% of the global child deaths occur in the neonatal period, Low and middle income countries need effective and simple methods to improve hospital based neonatal care.<sup>19</sup> The knowledge of the causes of respiratory distress is important to plan facilities. The overall mortality rate in the present study was 21.5% which is lower than that reported from other centres.<sup>1,3</sup> RDS, TTN, and MAS were found to be 24.4%, 14%, 6.4% respectively while studies in developing countries show 18%, 16% and 12%. The difference is more likely to be due to proper facilities in hospitals.<sup>14,18,20</sup> The signs and symptoms of respiratory rate >60/min were found in 135 (78.48%) neonates, 103 (59.9%) had grunting, 99 (57.6%) had subcostal retractions and nasal flaring was found in 103 (59.9%). Results of earlier studies show 45.8% neonates had grunting, 88% had subcostal retractions, nasal flaring was found in 90% and cyanosis in 98.2%.<sup>21</sup> Patients in the current study were at significant risk for mortality 37 (21.5%), pulmonary morbidity, and adverse signs and symptoms, all of which occurred at rates similar to those reported for neonates being referred for higher levels of care.<sup>22</sup> Much of the mortality and morbidity was in neonates with low gestational age and low birth weight. In primary neonatal care, rapid breathing, poor feeding and difficult breathing are

useful symptoms suggestive of respiratory distress. Earlier studies on neonatal pneumonia have included neonates with only radiological findings and have not considered blood culture positivity in the diagnosis of neonatal pneumonia. One such study<sup>23</sup> reported neonatal pneumonia in 37.9% neonates with respiratory distress. Another study also had 35% neonates with respiratory distress, while in the current study it was found to be in 18%.

The limitation of the study is that not all the causes of respiratory distress were addressed like cardiac patients were referred to paediatric cardiology unit of this hospital. So we could not know the outcome as they were not included in the study. Likewise, neonates with surgical causes of respiratory distress were referred to the surgical unit so they were also not included in the study. Another limitation is that cultural practices were not taken into consideration.

## Conclusion

PNA, RDS, Pneumonia, and TTN are the major cause of respiratory distress in preterm neonates presented with respiratory distress. 25% of preterm neonates presented with respiratory distress require mechanical ventilation but as whole 78.5% preterm neonates presented with respiratory distress were improved and discharged with medical advice.

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## ORIGINAL ARTICLE

# Epidemiology and Seasonality of Influenza - A Study in an Urban Area of Bangladesh

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### Abstract

**Background:** Influenza annually infects 5% - 15% of the global population, resulting in an estimated 250,000 - 500,000 deaths per year. Bangladesh is a populous country with widespread outbreaks of BIRD-FLU in poultry and is potentially at risk of emergence of novel strains of H5N1 which may herald the onset of a new epidemic or even pandemic of influenza in human.

**Objective:** As a part of nationwide influenza surveillance study, we evaluated the epidemiology of influenza viral illness.

**Methods:** Patients attending the hospital OPD having fever with cough or sore throat (Influenza like illness - ILI) and those who are hospitalized with cough and difficult breathing (severe acute respiratory illness - SARI) are included as case in our study. Between June 2007 to June 2013 we collected specimen from 1283 case patients and tested for influenza virus in the microbiological laboratory of ICDDR,B, Dhaka.

**Results:** Between June 2007 to December 2013 we collected sample from 1283 patients. 185 cases were positive for influenza virus (14.4%) out of which majority (52%) were children (0-15 years). Influenza A & B viral illness was 63% and 37% respectively. Subtyping of influenza A virus showed that A/H1, and A/H3 were 13% and 35% respectively while H1N1 strain was the highest (52%). No case of A/H5 (H5N1-Bird-Flu) was detected in our study. Seasonality graph showed that influenza illness was clearly seasonal; majority of the cases were detected between April to September concurrent with rainy season with high relative humidity and elevated temperature.

**Conclusion:** Seasonal outbreak of influenza occurs in our country, particularly in rainy season. Toddlers and adolescents more frequently suffer from influenza.

**Key words:** Influenza virus, Epidemiology, Seasonality.

### Introduction

Human civilization witnessed numerous epidemics and pandemics in various ages. A lot of human lives are lost by the epidemic and pandemics caused by plague, small pox, cholera, malaria, yellow fever and influenza. By far influenza pandemic has caused the highest toll of life. Influenza annually infects 5%-15% of the global population, resulting in an

estimated 2,50,000 - 5,00,000 deaths per year.<sup>1,2</sup> The prevalence and burden of influenza are well described for the temperate countries,<sup>3</sup> but much less is known about the epidemiology and seasonality of influenza in tropical countries. Hospital surveillance in Kenya found 248 (38%) influenza positive out of 660 collected samples.<sup>4</sup> Surveillance data from Pune and Chennai in India suggested that 5%-12% of the influenza like

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illness (121 cases) were due to influenza, especially during the rainy season.<sup>5</sup> In a study conducted by ICDDR,B, Dhaka, it was reported that 14% of children with acute respiratory infections tested positive for influenza.<sup>6</sup> Bangladesh is a populous country with widespread outbreaks of Bird - Flu in poultry, and is potentially at risk of emergence of novel strains such as novel H1N1 and H5N1 infecting human.

Such incidence may herald the onset of a new epidemic or even pandemic of influenza which may be divesting to our country. For this reason, the institute of Epidemiology, Disease Control and Research (IEDCR) of the Government of Bangladesh, along with ICDDR,B, Dhaka, started a nationwide influenza surveillance study in collaboration with Centre for Disease Control and Prevention (CDC), Atlanta, United States. As a part of this study, we quantified the prevalence of influenza infections, among persons seeking care at Dhaka National Medical College, a tertiary level teaching hospital. We also identified circulating influenza virus strains, studied epidemiology, explored seasonality and characterized clinical manifestations of influenza.

### Materials and Methods

Patients attending the hospital OPD having fever with cough or sore throat (Influenza like illness - ILI) and those who are hospitalized with cough and difficult breathing (severe acute respiratory illness - SARI) are included as cases in our study. After obtaining ethical clearance of the hospital authority and written informed consent from the parents, a throat swab and a nasal swab specimen are collected from each study case and also demographic and clinical informations are recorded. Samples are transported to ICDDR, B where those are tested for presence of influenza virus by real time rT - PCR. Observational data are analyzed by statistical software SPSS.

### Results

Between June 2007 to 2013, specimen from 1283 case patients were collected. Among them 185 (14.4%) were positive for influenza (Table - I). Distribution of age of the influenza positive cases (Table - II) showed that majority of them are between 0-15 years of age (52%). Percentage positivity of study cases also shows that this age group was having high risk

of suffering from influenza fever among the ILI and SARI cases - 13.8% (Table - III). Both the strains of influenza A & B were detected during the surveillance (Table - IV). Among the influenza type A, subtyping revealed incidence of A/H1, A/H3 and pandemic H1N1 (novel A/H1). There was no incidence of influenza A/H5 (H5N1 - Bird-Flu) during the study period (Table - V). The influenza activity was clearly seasonal, majority cases were detected between April to September each year (Fig: 1). During the months of peak activity 30% - 70% of study patients were tested influenza positive whereas very few influenza infections occurred between October and March.

**Table I**  
*Distribution of Influenza positive cases*

	No.	Percentage
Sample collected	1283	
Influenza +ve	185	14.4%

**Table II**  
*Distribution of influenza positive cases by age group*

Age group	Influenza positive	Percentage
0 – 15 years	96	52
16 – 40 years	55	30
41 – 60 years	19	10
> 60 years	11	06
Total	185	14.4

**Table III**  
*Distribution of percentage positivity of influenza cases according to age group*

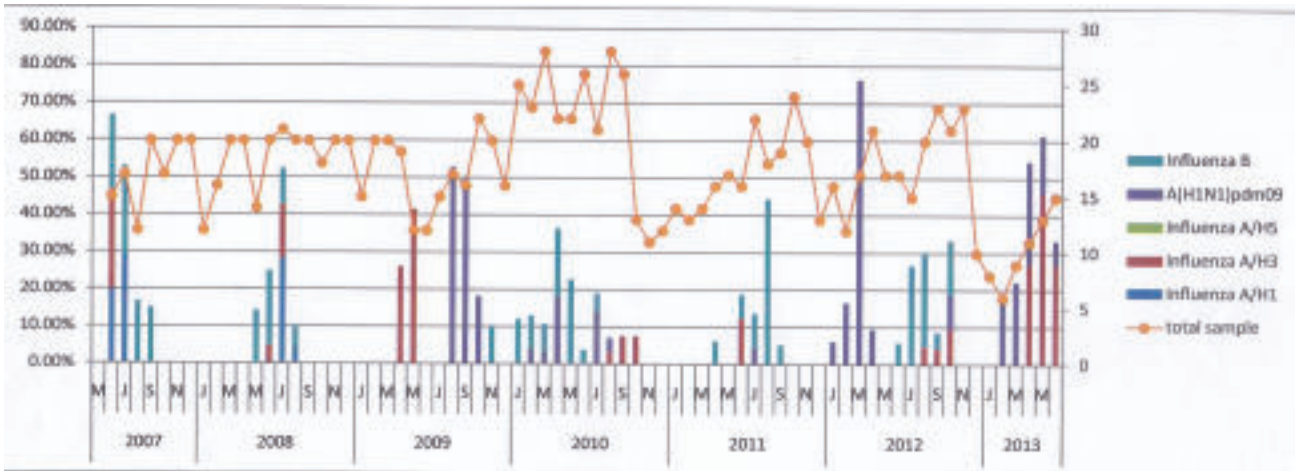
	Sample tested	Influenza positive	Percentage
0 – 15 years	697	96	13.8
16 – 40 years	424	55	13.0
41 – 60 years	119	19	16.0
> 60 years	43	11	9
Total	1283	185	14.4

**Table IV**  
*Distribution of influenza cases according to viral types*

Viral type	No.	Percentage
Influenza A	117	63%
Influenza B	68	37%
Total	185	100%

**Table V**  
*Distribution of influenza cases according to viral subtypes*

Viral subtype	No.	Percentage
Influenza A/H1	15	13%
Influenza A/H3	41	35%
Influenza A/H5	0	0%
Influenza H1N1	61	52%



**Fig 1** *Influenza seasonality in DNMCH*

## Discussion

Our study was conducted as a part of nationwide surveillance in 12 large hospitals across the country with a view to identify prevalence of influenza fever and detect the diversity of circulating strains of influenza virus in this part of world. This will add to our knowledge the role of influenza viral illness as part of morbidity and mortality of the population due to febrile illness and acute respiratory infection largely in children which is the principal cause of morbidity and mortality of children in our country. The study also aimed at recognizing the epidemiology and seasonality of influenza viral illness for better understanding of the disease as well as for proper action plan to control influenza epidemic, eg. timely implementing vaccination against influenza. Simultaneously we also performed surveillance of human infection of Bird-Flu in the study population, as part of nationwide preparedness against a possible future Bird-Flu epidemic in human. Our study revealed that influenza virus is prevalent in our country as a causative agent of febrile illness and acute respiratory infection. 14.4% of the cases were positive for influenza virus which is similar to a prior

study by ICCDR,B who found 14% influenza positive cases in under 5 children in Kamalapur, a low income urban neighborhood of Dhaka City.<sup>6</sup> We found that all age groups were affected with influenza but the proportion is greatest among toddlers and teenage (52%), nearly half of them were less than 5 years of age. As AR1 contribute to 21% death of children less than 5 years in Bangladesh<sup>7</sup> and influenza being a major etiological cause of ARI in its peak season, its prevention by non-pharmaceutical interventions or vaccination could contribute to mortality reduction in children under 5 year and achieving millennium development goal of reducing infant and children mortality (MDG-4).<sup>8</sup> Percentage positivity in our study showed high risk in toddlers and adolescents (13.8%) among the ILI and SARI cases. In this study it was found that both of the strains of influenza virus, type A and type B, which are circulating in the Asian countries, are present in Bangladesh<sup>2</sup>. Among the influenza type A, subtyping revealed incidence of A/H1, A/H3 and pandemic H1N1. No human infection by subtype H5N1 (Bird-Flu) was detected in our study cases. In a study conducted by ICCDR,B at Kamalapur in Dhaka City one human

case of infection with influenza AH5 (H5N1) was found during two years of surveillance in 2004 - 5.<sup>9</sup> In our study the influenza activity was clearly seasonal, the majority of cases were detected between April to September. The seasonality is consistent with the study by ICDDR,B where also the peak season was April to September.<sup>10</sup> Higher percentage positivity appears concurrent with rainy season with high relative humidity and elevated temperature. The seasonality in our study does not coincide with the seasonality of Bird-Flu among poultry in our country which occurs during October - March.<sup>11</sup> This reduces the opportunity of reassortment of avian strain with a human strain in Bangladesh (Antigenic Drift).<sup>12</sup> Probably due to this natural safety profile no human infection of Bird-Flu occurred inspite of several epidemic of Bird-Flu among poultry in our country during our study period. Thus surveillance of human infection of Bird-Flu was also done in our study.

This study provided only limited information as a small number of patients of a small area of the country was enrolled which is not representative of the whole country. Further study of longer duration would help better understanding of epidemiology of influenza.

### Conclusion

Seasonal outbreak of influenza occurs in our country, particularly in rainy season, which causes considerable morbidity and hospital visits. Toddlers and adolescents more frequently suffer from influenza.

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## ORIGINAL ARTICLE

# Diagnosis of Meningitis in Children Presenting with First Episode of Febrile Seizure

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### Abstract

**Background:** Febrile seizures are the most common cause of seizures in children less than five years of age presenting to the emergency department. The American Academy of Pediatrics (AAP) strongly recommends CSF analysis in the work up of every child under 18 months of age with a first episode of febrile seizure to rule out acute bacterial meningitis.

**Objective:** The objective of this study was to determine the frequency of meningitis in children who presented with first episode of fever with seizure and also the predictors of meningitis among them.

**Methods:** The records of children admitted to Dhaka Shishu (Children) Hospital between 1st December 2015 to 31st December 2016 were reviewed. All children between 6 months to 6 years of age having first episode of seizure, associated with fever were included in the study and subjected to retrospective analysis of data collected from the hospital records.

**Results:** This study included 95 children with febrile seizures, 70 children had simple febrile seizures (SFS) and 25 children presented as atypical febrile seizures (AFS). Lumbar puncture was performed in 38 children (13 with SFS and 25 with AFS). The CSF analysis was normal in all the children who presented as simple febrile seizures. There was 28% prevalence of meningitis in children with atypical febrile seizures who underwent lumbar puncture. The CSF yielded suggestive of bacterial meningitis was as high as 47% in children below 1 year in whom lumbar puncture was done.

**Conclusions:** Children presenting with first episode of atypical febrile seizures found to have high frequency of meningitis. Lack of meningeal signs does not exclude meningitis especially in young infants, and pretreatment with antibiotics can mask the signs of meningeal irritation.

**Keywords:** Meningitis; Febrile seizure.

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## Introduction

Febrile seizures (FS) are the most common cause of seizures in infants and toddlers presenting in the pediatric emergency department which is mostly benign. Two to five percent of children experience at least one or more episodes of febrile seizures.<sup>1</sup> Febrile seizures are classified into simple and complex febrile seizures. Simple febrile seizures (SFS) are defined as generalized seizures occurring only once in a 24-hour period and lasting less than 15 minutes. Whereas, complex/atypical febrile seizures (AFS) are described as focal seizures, lasting more than 15 minutes and occurring more than one time in 24 hours.<sup>2</sup> Simple febrile seizures are benign and self-limiting. They have better prognosis and carry very low risk for further epilepsy. Probability of acute bacterial meningitis presenting as fever with seizures varies from 0.6 % to 6.7 %.<sup>2</sup>

Seizures may be the sole presentation of bacterial meningitis in febrile infants.<sup>3</sup> Seizures are the first manifestation of meningitis in 16.7% of children and in one-third of these patients, whereas meningeal signs and symptoms may not be evident.<sup>4</sup> Therefore, it is mandatory to exclude underlying meningitis in children presenting with fever and seizure prior to making the diagnosis of FS.<sup>5</sup> The initial concern in these children is always to make a proper decision regarding to do an LP to exclude meningitis. Awareness of the prevalence of meningitis and its related factors in children presenting with FS to help physicians to make proper decisions in these situations is necessary.<sup>5</sup> There are several clinical studies worldwide reporting the prevalence of meningitis among children with FS.<sup>6-8</sup> Some of these studies suggest that in the absence of typical meningeal signs, then an LP should be considered in children with complex seizures, prior antibiotic therapy, age less than 12 months, or incomplete vaccination history.<sup>9</sup>

The American Academy of Pediatrics (AAP) strongly recommends lumbar puncture for CSF analysis in the work up of every child under 18 months of age with a first episode of febrile seizure since acute bacterial meningitis is difficult to be ruled out.<sup>3</sup> Many current studies have found that acute bacterial meningitis manifesting as simple febrile seizure is unlikely and that the above guidelines are not being strictly followed.<sup>6,10</sup> Studies revealed that about 50% children undergo Lumbar puncture with first episode of febrile seizure.<sup>11</sup> The objective of this study was to determine the frequency of meningitis in children who presented with first episode of fever with seizure and also the predictors of meningitis among them.

## Materials and Methods

This was a hospital based retrospective cross sectional study. All children admitted to Dhaka Shishu (Children) Hospital between 6 months to 6 years of age presenting with first episode of convulsions associated with fever of whom CSF analysis was done were included in this study. Children who had suffered a previous seizure, underlying chronic neurologic condition (hydrocephalus, brain tumor, neurocutaneous syndrome or cerebral palsy), congenital anomalies and biochemical abnormalities (hypoglycemia, hypocalcaemia and hyponatremia) were excluded from the study. Records of all children admitted with complaints of fever with seizures, in the age group of 6 months to 6 years from 1st December 2015 to 31st December 2016 were reviewed. The collected data included age, gender, seizure type, and history of previous episode of seizures, signs of meningeal irritation, postictal drowsiness, and pre-treatment with antibiotics, blood investigations, and CSF analysis including culture. Bacterial meningitis (BM) was defined as growth of a pathogen from CSF culture or CSF pleocytosis with growth of a pathogen from the blood culture. In cases with CSF pleocytosis and history of pretreatment with antibiotics, the cases were considered as bacterial meningitis. CSF pleocytosis with no growth of a pathogen from CSF or blood culture was considered as aseptic meningitis if the patient was not pre-treated with antibiotics before admission. Data was analyzed using SPSS version 17;  $p < 0.05$  was considered significant.

## Results

A total of 38 patients with first episode of fever with seizure were included in this study. CSF analysis was normal in 32 children (84.2%). Diagnosis of bacterial meningitis was made in 6 cases (15.8%). Among 6 diagnosed cases of meningitis, majority 5 (83.3%) were aged less than 2 years and none of them had signs of meningeal irritation (Table-I & II).

All the patients who were diagnosed to have meningitis presented as atypical febrile seizures. In children with normal CSF, 13(40.6%) were presented as simple febrile seizures and 19(59.4%) presented as complex febrile seizures. Only one (16.7%) among 6 cases of meningitis presented with signs of meningeal irritation, elevated CRP and leukocytosis present in 66.6% cases. All the patients who were diagnosed to have meningitis got pretreatment antibiotics (Table-III).

**Table I**  
*Age distribution of simple febrile seizures*

Age group	SFS (CSF revealed no meningitis)	SFS(CSF revealed meningitis)	Total no in respective age group
6 months to 1 year	2	0	2
1 year to 3 years	7	0	7
3 years to 6 years	4	0	4

**Table II**  
*Age distribution of complex febrile seizures*

Age group	SFS (CSF revealed no meningitis)	SFS (CSF revealed meningitis)	Total no in respective age group
6 months to 1 year	4	4(66.6%)	8
1 year to 3 years	7	1(16.6%)	8
3 years to 6 years	8	1(16.6%)	9

**Table III**  
*Predictors of meningitis among study population in which CSF analysis was done*

Variables	Meningitis n=6 (%)	No Meningitis n=32 (%)	P-value
Gender			
Male	4(66.6)	13(40.6)	0.534
Female	2(33.4)	19(59.4)	
Febrile seizure			
Simple	0	13(40.6)	0.051
Atypical	6(100)	19(59.4)	
Duration of seizure			
<15 min	3(50)	10(31.3)	0.635
>15 min	3(50)	22(68.7)	
Postictal drowsiness			
Present	5(83.3)	22(68.7)	0.642
Absent	1(16.7)	10(31.3)	
Meningeal signs			
Present	1(16.7)	1(3.1)	0.837
Absent	5(83.3)	31(96.9)	
White blood cell count			
Leukocytosis	4(66.6)	24(75)	0.315
Normal	2(33.4)	8(25)	
Sr. CRP			
Normal	2(33.4)	18(56.2)	0.487
Elevated	4(66.6)	14(43.8)	
Hb			
Normal	4(66.6)	20(62.5)	0.586
Anemia	2(33.4)	12(37.5)	
Pre-treatment with antibiotics			
Present	6(100)	12(37.5)	0.004
Absent	0	20(62.5)	

## Discussion

In this study, the prevalence of acute bacterial meningitis among children (6 months to 6 years) with a first episode of febrile convulsion that underwent lumbar puncture, was 15.8% which was relatively similar to results obtained by Owusu-Ofori et al<sup>12</sup> in Ghana who found high prevalence (10.2%) of meningitis in children who presented with febrile seizure. On the other hand few studies, done by Batra et al<sup>13</sup> in India and Kimia et al<sup>7</sup> in USA found very low prevalence of meningitis in children with febrile seizures i.e., 2.4% and 2.7% respectively. Seltzer et al<sup>8</sup> showed intermediate prevalence of 4.7%.

In this study not even a single case of meningitis presented as simple febrile seizure, whereas the prevalence of meningitis in children with atypical febrile seizures was 24% which is statistically significant finding (P value < 0.05). Kimia et al<sup>14</sup> found that 0.86% of children who presented as first episode of simple febrile seizure, compared with 4.8% of children who presented as complex febrile seizures had meningitis. Najaf-zadeh et al<sup>5</sup> reported that in children presenting with first episode of simple febrile seizure 0.2% had bacterial meningitis where as it was 0.6% in case of complex febrile seizures. In this study, the prevalence of meningitis was more in the age group less than 1 year. Many studies also reported similar results suggesting meningitis is more prevalent in children less than 1 year of age.<sup>2,12</sup>

In this study out of 6 children with bacterial meningitis only 1 child had signs of meningeal irritation. Whereas in studies done by Joshi et al<sup>2</sup> and Laditan et al<sup>16</sup> none of the children with bacterial meningitis had signs of meningeal irritation. This clearly suggests that meningeal signs are not reliable in the clinical diagnosis of meningitis in infants. In this study, we did not find any statistically significant correlation clinical or blood investigation variables that predict meningitis. Limitation of this study was small sample size.

### Conclusion

Children presenting with first episode of atypical febrile seizures found to have high frequency of meningitis rather than those presenting with simple febrile seizures. Lack of meningeal signs does not exclude meningitis especially in young infants, and pretreatment with antibiotics can mask the signs of meningeal irritation. Hence we suggest that CSF analysis should be done in all cases who present with first episode of complex febrile seizures and especially those treated with prior antibiotics.

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## ORIGINAL ARTICLE

# Frequency of Urinary Tract Infection among Protein Energy Malnutrition in under 5 Children

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### Abstract

**Introduction:** In childhood, UTI is often difficult to detect as symptoms and signs are not easily identified. Missed diagnosis is particularly frequent in malnourished children in whom the prevalence is high. In developing countries, therefore, UTI is likely to be present in at-risk hospitalized children. However, data on this subject is inconclusive. For these reasons, present study was undertaken of all cases of malnutrition with UTI, diagnosed in the Dhaka Shishu(Children) Hospital.

**Objective:** This study aimed to determine the frequency of urinary tract infection in under 5 children with protein energy malnutrition.

**Methods:** This was a comparative cross-sectional study, done in Dhaka Shishu Hospital (DSH) during January 2010 to October 2011. We include the patients with severe acute malnutrition admitted in DSH aged 6 months to 5 years as study group. These patients are either severely wasted or having bipedal oedema. Well-nourished patients matched for age and sex as comparative group. These patients are admitted with fever, diarrhea, vomiting etc and their anthropometric measurements was within normal limit. The sample size was 180, among them 110 were malnourished and 70 were nutritionally normal. All patients who have fulfilled the inclusion criteria were enrolled in the study. At enrollment detailed history was taken, thorough clinical examination performed and findings was recorded in a questionnaire. For all enrolled cases, complete blood count, urine routine and culture, renal function test,USG of KUB region and x-ray chest was performed. Urine sample were collected by supra pubic puncture.

**Results:** Among the study population urine culture positive UTI was found in 20 children. Among them 18 were in malnourished group and only 2 were in well nourished group. The rate of UTI in malnourished children were 16.36%. E.coli was the commonest cause of UTI, which is also reflected in our study. All the organisms were sensitive to imiphenem and all of them were resistant to ampicillin, amoxicillin, cephalixin, nalidixic acid and ciprofloxacin.

**Conclusion:** Frequency of urinary tract infection is higher in malnourished children in comparison to well nourished children. E.coli is the major organism and most of them are multi drug resistant.

**Keywords** Urinary tract, Infection, Protein Energy Malnutrition, Cross sectional study

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## Introduction

Urinary Tract Infection (UTI) is a common health problem in children. It is the second highest cause of morbidity in children after respiratory tract infections.<sup>1</sup> UTI is defined as growth of a significant number of organisms of a single species in the urine, in presence of symptoms. Significant bacteriuria is growth of a single species with a colony count of  $>10^5$ /ml in a mid-stream clean catch urine sample.<sup>2-4</sup> *E. coli* is the main causative organisms accounting for 75-90% cases but proteus, *Pseudomonas*, enterococcus & klebsiella species can also cause UTI.<sup>4</sup> There will be high index of suspicion for UTI in children with poor feeding, failure to thrive or in a child with Fever without focus, vomiting, diarrhoea, screaming, irritability, foul smelling urine, cloudy urine, hematuria, frequency, abdominal pain, enuresis, convulsion etc may also be the presentation of UTI.<sup>1</sup> The occurrence of infections depends on two factors: predisposing factors and host immunity factor. Predisposing factors of UTI in children include an obstructive defect of urinary tract, chronic constipation, and vesicoureteral reflux.<sup>5</sup> When host immunity is suppressed by any condition like malnutrition they are more prone to develop UTI.

Children with PEM have impaired immune function including depressed hypersensitivity response, low T lymphocytes, disturbance of lymphocyte response, decreased phagocytosis secondary to lack of complements and low secretion of immunoglobulin A (IgA).<sup>7</sup> In PEM patients both cell mediated and humoral immunity are diminished, so typical signs of infection – such as fever and increased WBC count are frequently absent.<sup>1,6</sup> In PEM patient, glomerular filtration is reduced, capacity of kidney to excrete excess acid or a water load is greatly reduced and urinary tract infection is common and any bacteria on urine microscopy or more than 10 leukocytes per high power field is significant.<sup>6</sup>

Malnutrition is a major health problem among Bangladeshi children.<sup>10</sup> About 90% of children of Bangladesh suffering from different grades of malnutrition.<sup>11</sup> Among the poor populations many of them are suffering from malnutrition. Malnutrition is directly or indirectly responsible for 66% of childhood death, accordingly malnutrition is the main cause of death of 250,000 children each year (over 600/day) under the age of 5 years.<sup>12</sup>

There is a complex three-way relationship between malnutrition, the immune system and infection, with malnutrition eliciting immune system dysfunctions which in turn promote increased vulnerability of the host to infection, and the latter intensifying the severity of malnutrition.<sup>7</sup> Therefore, early detection and prompt treatment of infection in children with PEM is very important. Two Indian studies found the prevalence of UTI among malnourished children was 15% and 8.3% respectively.<sup>1,8</sup> Two African studies found incidence of UTI in PEM patient was 26% and 43% respectively.<sup>14,15</sup> In most cases isolates were Gram negative enteric bacilli and sensitive to a combination of Ampicillin and Gentamicin.<sup>14</sup>

The incidence of UTI in malnourished children are varies from country to country, like in Africa it is very high in comparison to Asian countries, probably due to difference of culture and socio economic condition and severity of malnutrition. This study aimed to determine the relationship between protein energy malnutrition and urinary tract infection in children of Bangladesh and this will help our policy makers to take appropriate measures.

## Materials and methods

This was a comparative cross sectional study done in Dhaka Shishu Hospital, Sher-e-Bangla Nagar, Dhaka-1207, over 22 months from January 2010 - October 2011.

We included the patients with severe acute malnutrition admitted in DSH aged 6 months up to 5 years as study group, these patients was either severely wasted or having bipedal oedema. Anthropometrically normal child matched for age and sex taken as comparative group, who were admitted with other medical problems. We excluded the PEM patient with renal & other congenital anomaly in external genitalia and spine, patient receiving antibiotics in the last 3 days and patient having immunocompromised disease such as nephrotic syndrome, leukemia or HIV. Our sample size was 180, among them 110 were malnourished and 70 were nutritionally normal.

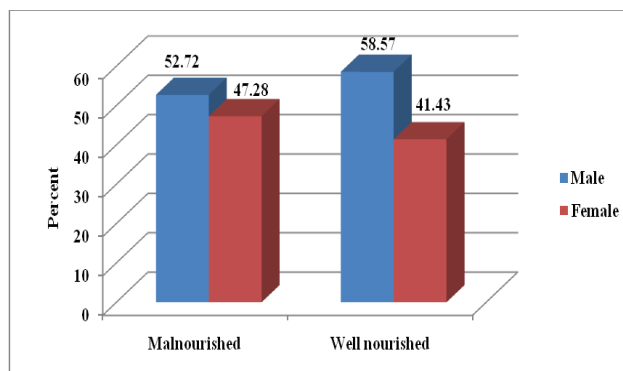
All patients who fulfilled the inclusion criteria was screened for eligibility and was enrolled in the study and parents provide informed written consent. At enrollment detailed history was taken, thorough clinical examination performed and findings was recorded on questionnaire. For all enrolled cases,

complete blood count, urine routine and culture, renal function tests, ultrasonography of KUB region and x-ray chest was performed. Urine sample was collected by supra pubic puncture, sterile dressing was placed at the site of puncture and urine send to laboratory by sterile container. The data was analyzed according to standard procedure. SPSS version 12.0 for Windows (SPSS Inc, Chicago, IL, USA) software was used for data entry and analysis. Results of the findings was verified by conducting standard tests for significance (p-value < 0.05), including un paired student T-test, odds ratio and Chi-square ( $\chi^2$ ) tests, as appropriate. Permission from ethical board of Dhaka Shishu Hospital was taken prior to starting the thesis work.

## Results

Among all 180 study population 76(42.22%) were within 6 to 12 months age group, 84 (46.67%) were within 12 to 24 months age and 20 (11.11%) were > 24 months of age.

Age	Malnourished children	Well nourished children	Total
6 -12 months	43(39%)	33(47.14%)	76(42.22%)
12-24 months	52(47.27%)	32(45.71%)	84(46.67%)
>24 months	15(13.63%)	5(7.14%)	20(11.11%)
Total	110(100%)	70(100%)	180(100%)



**Fig 1** Sex distribution among the study population (n=180)

This fig shows 52.72% cases was male in malnourished group and in well nourished group male was 58.57%

**Table II**  
*Characteristics of study population*

Patient characteristics	Malnourished	Well nourished	Total
Increase Frequency of micturition	Present 10	5	15 (8.33%)
	Absent 100	65	165 (91.67%)
Fever	Present 54	30	84 (46.67%)
	Absent 56	40	96(53.33%)
Diarrhoea	Present 72	54	126(70%)
	Absent 38	16	54(30%)
Oedema	Present 25	0	25(13.89%)
	Absent 85	70	155(86.11%)
Pulmonary infection (by CXR)	Present 43	20	63(35%)
	Absent 67	50	117(65%)

Among the study population, 8.33% have increase frequency of micturition, 84(46.67%) have fever, 126(70%) have diarrhea, 25(13.89%) have oedema and 63(35%) have pulmonary infection.

**Table III**  
*Pus cells in urine routine examination among study population*

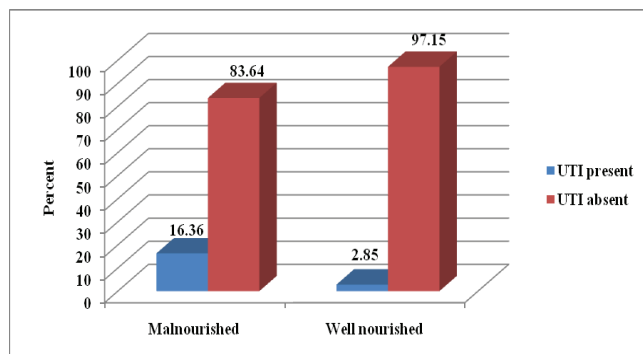
Nutritional status	Urine pus cell present	Urine pus cell absent	P value
Malnourished patient	16(14.54%)	94(85.45%)	.008
Well nourished patient	2(2.85%)	68(97.15%)	
Total	18(10%)	162(90%)	

Out of 180 study population 16(14.54%) had significant pyuria in malnourished group, compared to well nourished group.

**Table IV**  
*Results of urine culture among study population*

Nutritional status	Urine culture UTI(+)	Urine culture UTI(-)	Odds Ratio	Result
Malnourished	18(16.36%)	92(83.63%)	(18/2)/	6.65a
Well nourished	2(2.85%)	68(97.15%)	(92/68)	
Total	20(11.11%)	160(88.89%)		

UTI is about 7 times higher in malnourished children compared to well nourished children.



**Fig 2** Frequency of UTI among the study population (n=180)

Fig shows 16.36% of malnourished patients having urinary organism and only 2.85% of well nourished patients having urinary organism.

**Table V**

*Types of organisms growth in urine culture (n=20)*

Nutritional status	E. coli	Klebsiella	Total organisms
Malnourished	17	1	18(16.36%)
Well nourished	2	0	2(2.85%)

Frequency of UTI among malnourished children was 16.36%, but in well nourished children it was only 2.85%. E.coli being the commonest organism in majority cases.

**Table VI**

*Results of antimicrobial sensitivity pattern of organisms isolated in urine culture. (n=20)*

Name of drug	Organisms			
	Escherichia Coli (n=19)		Klebsiella (n=1)	
	Sensitive	Resistant	Sensitive	Resistant
Ampicillin/Amoxycillin	0	19 (100%)	0	1 (100%)
Cephalexin	0	19 (100%)	0	1 (100%)
Co-trimoxazole	10(52.63%)	9(47.37)	1(100%)	0
Gentamycin	11(57.9%)	8(42.1%)	0	1 (100%)
Nalidixic acid	0	19(100%)	0	1 (100%)
Nitrofurantoin	10(52.63%)	9(47.37)	0	1 (100%)
Ceftriaxone	11(57.9%)	8(42.1%)	0	1 (100%)
Ciprofloxacin	0	19(100%)	0	1 (100%)
Ceftazidime	11(57.9%)	8(42.1%)	0	1 (100%)
Netilmicin	12(63.16%)	7(36.84%)	0	1 (100%)
Amikacin	12(63.16%)	7(36.84%)	0	1 (100%)
Imipenem	19(100%)	0	1(100%)	0

Among 20 isolated urinary organism, all are resistant to ampicillin/amoxicillin, cephalixin, nalidixic acid and ciprofloxacin. All of them are sensitive to Imipenem.

## Discussion

Among the study population 12 months to 24 months age were more in number and in all age group male were more than female. Male to female ratio were 1.2:1. In both the group male were more than female and male preponderance in this group may be due to the possibility that the parents take more care of their male child and seek medical advice more frequently as compared to their female child. Similar male preponderance were also observed in the study of Ginsburg et al,<sup>16</sup> Dharnidharka et al,<sup>17</sup> Stanfield<sup>18</sup>, Chowdhury<sup>19</sup>, Alok<sup>20</sup> and Stull TL<sup>21</sup> et al..

In this study among the edematous malnourished children 40% having UTI. Edematous children having more urinary organisms as they are more prone to develop infection it may be due to their low immunity and the edema fluid can also acts as culture media for bacterial over growth. Among the study population 126 study population having diarrhea, 72 in malnourished group and 54 in well nourished group. Among the malnourished group 13.89% had UTI. Dharnidharka et al.<sup>17</sup> found 24% UTI in acute gastroenteritis, Srivath et al.<sup>22</sup> found 6% UTI in gastroenteritis. But they did not explained the reasons, why this significant association of UTI with acute gastroenteritis. Though significant number of UTI found in PEM with diarrhoea, we can not explain the reasons of this association, it may just be a co-existence or due to low immunity, low enzyme and changes in gastrointestinal epithelium and villi. Further study with large number of acute gastroenteritis with malnutrition is necessary to draw any conclusion.

In this study 46.67% of patients was presented with fever. Significant association of UTI with fever was observed by Gonzalez<sup>23</sup> and Crain et al.<sup>24</sup> (7.5% of UTI in their study), Hoberman et al.<sup>25</sup> (5.9% of UTI in their study). ARI was found in 39.1% of malnourished children, out of them 18.60% had UTI. Association of UTI with acute respiratory infection (ARI) was observed by Srivaths et al.<sup>22</sup> It may be due to co-existence or due to low immunity in malnourished patients.

Significant number of malnourished patient developed pyuria in this study. Pyuria (>10 pus cells/

HPF) was present in 10% cases. Several authors reported various findings so far as the pyuria and UTI are concerned. Chowdhury et al<sup>25</sup> found in 54% cases, Ginsburg et al<sup>16</sup> in 50% cases, Alok et al<sup>20</sup> in 34% cases. Dharnidharka et al<sup>17</sup> found pyuria in 100% cases of UTI.

In this study, 20 (11.11%) children had culture positive UTI. Among them, 18 (16.36%) were in the malnourished group and only 2 (2.85%) were in the well-nourished group. The frequency of UTI in malnourished children was 16.36% in this study. Our results are in general agreement with those of Arief et al.<sup>5</sup> and Bagga et al.<sup>1</sup> who found 16.4% and 15% incidence of UTI respectively in their study with PEM. Ibrahim et al<sup>26</sup> and Phillip et al<sup>27</sup> found incidence of UTI in PEM patients were 11.3% and 10.7% respectively. In an Indian study, it was found that the prevalence of UTI in malnourished children was 15% and 8.3% respectively.<sup>1,8</sup> In separate 2 African studies, it was found incidence of UTI in PEM patients was 26% and 43% respectively.<sup>14,15</sup> In Turkey, two studies found incidence of UTI in PEM were 30% and 39.2% respectively.<sup>28,29</sup>

In this study the frequency of UTI in healthy children was 2.85%, which was similar to previous findings.<sup>4</sup> E.coli was the commonest cause of UTI, which was also reflected in this study (95%). Similar results were observed by Ginsburg et al.<sup>16</sup> (E.coli in 88% of cases), Crain et al.<sup>24</sup> (E.coli in 94% of cases), Dharnidharka et al.<sup>17</sup> and Chowdhury et al<sup>19</sup> (E.coli were found in 100% cases).

Another study carried out by Phillip et al<sup>27</sup> found UTI in 10.7% patient with malnutrition. Two Turkish studies found much higher incidence of UTI in PEM (30% and 39.2% respectively).<sup>28,29</sup> Two Indonesian studies found incidence of UTI in PEM patients was 16.4% and 11.3% respectively.<sup>5,26</sup>

All the organisms were sensitive to imipenem and all of them were resistant to ampicillin, amoxicillin, cephalexin, nalidixic acid and ciprofloxacin. Klebsiella also sensitive to cotrimoxazole. Besides this, 63.16% of E.coli were sensitive to Netilmicin and Amikacin, 57.9% to Gentamycin, ceftriaxone and ceftazidime, 52.63% to Nitrofurantoin and cotrimoxazole. Similarly Chowdhury et al<sup>19</sup> found 100% isolates were resistant to Ampicillin. This study differs from the findings of Chowdhury et al. is that they found 100% E.coli were sensitive to cephalexin, Nalidixic acid and ciprofloxacin. Sharmin et al<sup>30</sup> found E.coli

are less sensitive to amoxicillin, cotrimoxazole, cephalexin and nalidixic acid ranges from 20-27%, but their sensitivity increases to ciprofloxacin-60%, gentamicin-60%, ceftriaxone-60%, ceftazidim-80% and imipenem to 100%. Sharmin et al<sup>30</sup> also found Klebsiella were 100% sensitive to imipenem and 70% to amikacin.

The reduced sensitivity pattern of organisms of this study to the above antibiotics due to facts that over past few years these organisms develop resistance to these drugs, because of their indiscriminate use in various diseases.

### Conclusion

Frequency of urinary tract infection is higher in malnourished children in comparison to well-nourished children. E.coli is the major organism causing urinary tract infection in these patients. Most of the cases, organisms are resistant to commonly used antibiotics.

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## ORIGINAL ARTICLE

# Parent Expectation and Satisfaction with Pediatric Care in High Dependency and Isolation Unit in a tertiary care Pediatric Hospital

Mohammed Reaz Mobarak<sup>1</sup>, Md. Rafiqul Islam<sup>2</sup>, AKM Tajuddin Bhuiyan<sup>3</sup>, Nabila Akand<sup>3</sup>, Ferdousi Begum<sup>5</sup>

### Abstract

**Background:** Parent satisfaction with hospitalized pediatric patients is important for management as it is closely related to compliance. The aim of this study is to determine the predicting factors including demographic data of the patients and their families and level of parent satisfaction for the services of physicians, nurses, healthcare personnel and facilities of hospital.

**Methods:** This study was conducted during January to June, 2017 by using a scaled questionnaire (face-to-face interview) four parts, one demographic factor of parents and patient and two parts with 8 questions grading 1 to 5 made by modification of MISS21 (Medical Interview Satisfaction Scale adapted for British general practice) and last part related to overall satisfaction. On a sample of 90 parents of children, age ranging from 1-144 months. The study-place was at the pediatric HDU & Isolation unit of Dhaka Shishu (Children) Hospital. Data were recorded in a preformed data sheet than into SPSS data sheet of a desktop computer and were analyzed by SPSS-22. Parental satisfaction was measured by mean and percentage in a grading scale and presented as table and graph.

**Results:** The mean parental satisfaction concerning friendliness of the receiving staff, consulting hour, infrastructure, waiting time, and phone-communication were 3.32, 3.85, 3.54, 3.58, and 2.96 respectively. The mean score of satisfaction regarding questions concerned with friendliness and helpfulness of medical staff, questions concerned with expertise, empathy and communication of the doctors, questions concerned with interaction of the doctors with the child were, 4.44, 4.58 and 4.26 respectively.

**Conclusion:** In our study, mean parental satisfaction concerning expertise, empathy and communication of the doctor was found 4.43. But the overall satisfaction was very satisfied 41.99%, satisfied 19.75%, averagely satisfied 30.47% which is lower than individual score of satisfaction. It infers that, parental satisfaction depends not only on medical-care alone, rather on overall satisfaction.

**Key words:** Parent satisfaction, High Dependency Unit (HDU), Medical Interview Satisfaction Scale (MISS).

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## Introduction

Every parent of a patient has an expectation when she or he interacts with her/his child's attending physician. The degree to which this expectation is met influences parents' perception of the quality of that experience and, thus, parent satisfaction is defined as the degree of an individual experience compared with her/his expectation.<sup>1</sup> There is a strong positive association between a parent's experience of consultation with her/his child's physician and actual health outcome.<sup>2-4</sup> There is a positive correlation between effective parent-physician interaction and patient's adherence to scheduled appointments as well as following physician's instruction correctly.<sup>5</sup> Improvement of patient-physician communication can result in better patient care and help patients adapt to illness and treatment.<sup>6</sup> In health care provision all over world, client satisfaction is gaining more and more importance.

Parents as well as patients and often fail to disclose their problems and anxieties when they are not satisfied with the doctor's attitude. The way a parent of a patient feels about her/his interaction with the physician affect future health seeking behaviour.<sup>7</sup> Reports from the USA suggest that over 90% of medical litigation is prompted by patients' perception that the doctor did not care for them.<sup>8,9</sup> The aim of this study, therefore is to assess the factors affecting satisfaction and level of parent satisfaction attending HDU & ISO unit of Dhaka Shishu(Children) hospital.

### Background of HDU and Isolation

Pediatric high dependency care (PHDC) is the provision of close observation, monitoring and treatment of children who are potentially physiologically unstable and demand management beyond the capacity of general pediatric care. PHDC is a Level-2 care between pediatric intensive care (PICU) which is a Level-3 care or above and pediatric observation care (POU) which is a Level-1 care. The HDU and Isolation unit was established in this hospital 4 years' back with a view to meet the demand of the patients who are not eligible for staying in the Intensive Care Unit (ICU) but occupying the beds of ICU. This effort of DSH is to cater the needs of patients stepped down from ICU as well as who were waiting to get a place in the ICU.

The aim of the study is to assess the factors affecting parent satisfaction, level of their satisfaction among parents of patients as well as patients admitted at the pediatric HDU of DSH.

## Materials and Methods

This research was conducted during January 2017 to June 2017 by using a face-to-face interview on 90 parents of children, age ranging from 1-180 months with a single structured questionnaire with four parts. Part I consisted of questions on demography such as parent's age, sex, education, number of family members, earning and living, patient's age and sex and disease concerned. Part II consisted of infrastructure and organization. Part III consisted expertise of medical staff (nurses and doctors), and Part IV included overall satisfaction of parents. The answers of Part II, III and IV were divided into five(5) scores like, very satisfied (5), satisfied (4), uncertain (3), unsatisfied (2), extremely unsatisfied (1). The study-place was at the 18-bedded pediatric HDU & Isolation ward of DSH, a 650 bedded tertiary care pediatric hospital in Bangladesh. Parents' answers for the Part I were taken at the beginning of admission, and rest of the parts were taken before discharge from the hospital independently. Data were input in the excel sheet in a desktop computer and analyzed by SPSS-22 version software and were presented in tabulated form as percentage.

## Results

A total of 90 parents responded to the survey. The parents included in the sample were 75 (83.33%) mothers and 15(16.66%) fathers and their age varied from 19 to 52 years (mean 24± 3.48), most of the parents were 21-30 years (73.33%) of age, education level of the parents were primary 31(34.4%), high school level, 26(28.9%), intermediate level 23(25.6%) and graduate to post graduate level, 10(11.1%). Most of the children's age were <60 months, 0-6 months 24(26.7%), and 7-60 months, 45(50%); male-female ratio of children 60:40. Most of the children admitted with an acute onset of illness, 68(75.55%), rest of them were admitted with chronic illness 15(16.66%) and 7(7.77%) were surgical cases. Among the admitted children 44(48.9%) were first-child of parents, and 11(12.2%) were third or fourth child. Among the admitted patients about 66(73.33%) took admission for the first time, rest of them were admitted for the second or more time.

**Table I**  
*Description of sample from filler of questionnaire*

	No.	%
Mother	75	83.33
Father	15	16.66
Age of parents		
Under 20 years	16	17.80
21-30 years	66	73.33
31-40 years	5	5.5
Over 40 years	3	3.4
Education of parents		
Graduation degree or Post graduation degree level	10	11.1
Intermediate college level	23	25.6
High school level	26	28.9
Primary School level	31	34.4
Age of the child		
0-6 month	24	26.7
7-60 month	45	50.0
61-120 month	18	20.0
120-180 month	3	3.33
Gender of child		
Male	54	60
Female	36	40
Description of sample		
Acute illness	68	75.55
Chronic illness	15	16.66
Children after operation or procedure	7	7.77
Which child is presented in the practice		
First child	44	48.9
Second child	35	38.9
Third or further child	11	12.2
Number of times the parents visited the pediatric practice		
First time	66	73.33
Second time	18	20
Several time	6	6.66
Insurance status of child		
Life insurance with govt. or private company	5	5.55
No life or health insurance	85	94.44

When the parents were asked about their satisfaction for infrastructure and organization, they replied in the following ways which has been elaborated through a scoring system.

The scores of the question concerning friendless of staff showed very satisfied 9(9.99%), uncertain 60(66.6%), unsatisfied 2(2.22%) and extremely unsatisfied 2(2.22). The mean score of satisfaction was 3.32.

The score for the question in regards to consulting hour were very satisfied 36(39.96%), satisfied 7(7.77%), uncertain 45(49.95%) and extremely unsatisfied 0%. The mean score of satisfaction was 3.85.

The scores of the question concerning infrastructure of the practice were very satisfied 9(9.99%), satisfied 36(39.96%), uncertain 41(45.51%) and extremely unsatisfied 1(1.1%). The mean score of satisfaction was 3.54.

The scores of the question concerned with waiting time were very satisfied 7(7.77%), satisfied 44(48.84%), uncertain 34(37.74%), unsatisfied 3(3.33%) and extremely unsatisfied 2(2.22%). The mean score of satisfaction was 3.56.

The scores in regards to the satisfaction concerning cell-phone availability of the nurses and doctors in practice beyond duty period found to be very satisfied 4(4.44%), satisfied 14(15.54%), uncertain 51(56.61%), unsatisfied 17(18.87%) and extremely unsatisfied 4(4.44%). The mean score of satisfaction was 2.96.

The scores of the question concerning about friendliness and helpfulness of medical staff were very satisfied 64(71.11%), satisfied 11(12.22%), uncertain 8(8.88%), unsatisfied 5(5.55%) and extremely unsatisfied 2(2.22%). The mean score of satisfaction was 4.44.

The scores of the question regarding the expertise, empathy and communication of the doctors were very satisfied 68(75.55%), satisfied 12(13.33%), uncertain 6(6.66%), unsatisfied 3(3.33%) and extremely unsatisfied 1(1.11%). The mean score of satisfaction was 4.58.

The scores of the question concerning the interaction of the doctors with the children were very satisfied 56(62.22%), satisfied 14(15.55%), uncertain 11(12.22%), unsatisfied 6(6.66%) and extremely unsatisfied 3(3.33%). The mean score of satisfaction was 4.26.

**Table II**  
*Result concerning infrastructure and organization*

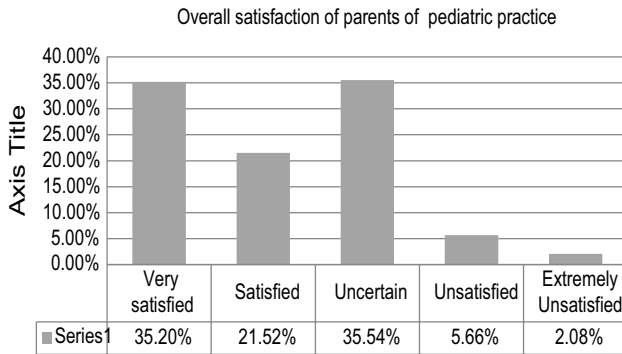
Level of satisfaction	Very Satisfied N (%)	Satisfied N (%)	Uncertain N (%)	Unsatisfied N (%)	Extremely Unsatisfied N (%)	Total Score	Mean score of Satisfaction
Score	5	4	3	2	1		
1. Friendliness of the staff at reception	9(9.99%)	17(18.87%)	60(66.6%)	2(2.22%)	2(2.22%)	299	3.32
2. Questions concerning the consulting hours	36(39.96%)	7(7.77%)	45(49.95%)	2(2.22%)	0(0%)	347	3.85
3. Question cornering infrastructure of the Hospital & HDU	9(9.99%)	36(39.96%)	41(45.51%)	3(3.33%)	1(1.1%)	319	3.54
4. Satisfaction with waiting time for starting treatment	7(7.77%)	44(48.84%)	34(37.74%)	3(3.33%)	2(2.22%)	323	3.58
	W. time 5 min.	W. time 10 min.	W. time 15 min	W. time 20 min.	W. time >20 min.		
5. Satisfaction with the telephonic availability of pediatric practice	4(4.44%)	14(15.54%)	51(56.61%)	17(18.87%)	4(4.44%)	267	2.96
6. Summation of total response and average percentage	65 (14.43%)	118 (25.59%)	231 (51.28%)	27 (5.99%)	9 (2.2%)	450 (99.99)%	3.43

**NB:** The mean score was calculated by dividing the total score of all (90) parents in each row by the number of parents: e.g Q-1 (Satisfaction with the telephonic availability of the pediatric practice),  $4 \times 5 + 14 \times 4 + 51 \times 3 + 17 \times 2 + 4 \times 1 = 267$  (total score);  $267 \div 90 = 2.96$ .

**Table III**  
*Results concerning expertise of medical staff and doctor Score of Satisfaction*

Level of satisfaction	Very Satisfied N (%)	Satisfied N (%)	Uncertain N (%)	Unsatisfied N(%)	Extremely Unsatisfied N(%)	Total Score	Mean score of Satisfaction
Score	5	4	3	2	1		
1. Friendliness and helpfulness of medical staff	64(71.04%)	11(12.21%)	8(8.88%)	5(5.55%)	2(2.22%)	400	4.44
2. Expertise , empathy and communication of the doctor	68(75.48%)	12(13.32%)	6(6.66%)	3(3.33%)	1(1.11%)	413	4.58
3. Interaction of the doctor with the child	56(62.16%)	14(15.54%)	11(12.21%)	6(6.66%)	3(3.33%)	384	4.26
Summation of total response and average percentage	188(69.56%)	37(13.69%)	25(9.25%)	14(5.18%)	6(2.22%)	1197	4.43

Overall satisfaction of parents of pediatric practice in this study we found very satisfied 35.20%, satisfied 21.52%, uncertain 35.54%, unsatisfied 5.66%, extremely unsatisfied 2.08%.



**Fig 1** Overall satisfaction of parents of pediatric practice

## Discussion

The impression of the parents depends on multiple factors. It begins with the first visit to the reception/ticket counter crossing the security, then pediatric OPD/emergency and finally IPD. The levels of satisfaction of the parents vary depending on the atmosphere and appearance of the waiting area, duration of the consultation as well as waiting-time. The co-operation of the security system is an important issue. In this study we could not include the evaluation of security system which is a pitfall of the study.

In our observation average waiting time was 15 minutes (SD±5 minutes). In this study parents who had to wait for 5 minutes were very satisfied (7.75%), those waited around 15 minutes were satisfied (48.1%) or averagely satisfied (37.4%), but those who waited for 20 minutes or more were unsatisfied (3.35%) or extremely unsatisfied (2.2%), mean score of satisfaction was 3.58. We also found parents who were satisfied with the waiting time were also satisfied with other services which are consistent with other studies.<sup>10</sup>

Regarding satisfaction on infrastructure, parents who came from district level or community level, or parents who were encountering hospitalization for the first time were very satisfied, possibly because they do not have any experience to compare with. The scores of the question concerning infrastructure were very satisfied 9(9.99%), satisfied 36(39.96%), and uncertain 41(45.51%). This is in agreement with the findings of the study conducted by EA Abioye Kuteyi et al at Nigeria, 2010.<sup>11</sup>

Apart from good professional care, parents of children visiting a pediatric set-up need to be satisfied in general, not only the doctors' ability to communicate

adequately, but listen carefully or spend sufficient time with the parents. Other factors e.g. decoration of the waiting area, adequate consultation-hours and a short waiting period are also important. Moreover, higher levels of satisfaction are related to the relationship between parents and the attending doctors. Our observation was that the highest rate of general satisfaction was achieved, with the time their doctors had given to the parents and their children. This also confirms the findings of other authors, Feddock et al. and Anderson et al. who found that time with the physicians was positively related to satisfaction.<sup>12, 13</sup> Feddock states that physicians can even mediate the negative effects of long waiting time by spending more time with their patients.<sup>14</sup> For the parents as well as for patients, it is very important that the doctor listens carefully, that they feel understood and furthermore, they understood the proposed therapy.<sup>15</sup> For the doctor on the other hand, a satisfied and compliant parent is very important, since there is a significant relation between patients, or, in our case parents' of the patients as the patients are mostly very young.<sup>16</sup> Then again, a good compliance is also essential for a successful treatment.<sup>6, 17</sup> we discovered that "very satisfied" patients are likely to visit the care-set-up again and all of would recommend them to others. Other authors also stated that satisfied patients would visit the care-facility again.<sup>18</sup> Furthermore; a satisfied patient will recommend the care-facility on an average of 4 to 5 people.

Three subscales of physician- patient interaction those were considered in this study, namely a) friendliness and helpfulness of medical staff b) expertise, empathy and communication of the doctors and C) interaction of the doctor with the child positively contributed to the parents' overall level of satisfaction (summation of total response and average percentage, mean score of satisfaction, 4.43).

The scores of the questions regarding consulting hour were very satisfied 36(39.96%), satisfied 7(7.77%), and uncertain 45(49.95%). The mean score of satisfaction was 3.85.

## Conclusion

The value of assessing parent's satisfaction is crucially important particularly in a high dependency pediatric set-up. High dependency means stepping down from the most critical level of care e.g. ICU when parents are hopeful. The parental expectation

and demand are extremely high. In our study, parental satisfaction concerning expertise, empathy and communication of the doctors was 75.48% (mean score of satisfaction=4.58). The overall satisfaction concerning infrastructure, waiting-time and telephonic availability, friendliness of staff, expertise of doctors and nurses were very satisfied, 35.20%, satisfied, 21.52%, and averagely satisfied, 35.54%. This type of study was conducted for the first time in a pediatric critical care set-up in Bangladesh. It infers that not only satisfaction of medical care, parental satisfaction depends on overall general satisfaction. A multi-centered study with a bigger number of subjects is needed to find the actual scenario.

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## ORIGINAL ARTICLE

# A Comparative Study between Divided and Loop Sigmoid Colostomy for the Management of Anorectal Malformation (ARM)

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### Abstract

**Introduction:** There are various surgical options for management of anorectal malformations. Colostomy is usually performed as a first stage in a new born with high and intermediate variety of anorectal malformations.

**Objectives:** The aim of the study was to compare the clinical outcomes between divided and loop sigmoid colostomy for the management of anorectal malformations.

**Methods:** A total of 70 neonates with anorectal malformation were included in the study after fulfillment of inclusion and exclusion criteria from January 2014 to December 2015. They were randomly assigned to the divided colostomy group (group I=35 neonates) and loop colostomy group (group II=35 neonates). The comparative parameters between two groups were the operation time, post-operative complications such as wound infection, skin excoriation, prolapse of colostomy, retraction of colostomy and parastomal hernia. All patients were followed up for 2 months post-operatively.

**Results:** The age range of the patients was 1 to 7 days where majority of the patients were male. The statistical difference between the two groups regarding operation time was highly significant (0.0001). After operation, 28.6% patients developed skin excoriation in group I where in group II, 31.4% patients developed skin excoriation. In group I, 5.7% patients developed wound infection but none of them developed prolapse, retraction of colostomy and parastomal hernia. On the other hand, in group II, no patient developed wound infection and parastomal hernia but 14.3% patients developed prolapse and 5.7% patients developed retraction of colostomy. The statistical difference between the two groups regarding prolapse of colostomy was border line significant ( $p=0.054$ ).

**Conclusion:** Loop sigmoid colostomies were found to be associated with a higher incidence of prolapse than divided sigmoid colostomies. Though operation time was significantly more in dividing colostomy than in loop colostomy but skin excoriation, wound infection, retraction of colostomy and parastomal hernia were same in both groups.

**Key Words:** Anorectal malformation, Colostomy, Divided sigmoid colostomy, Loop sigmoid colostomy

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## Introduction

Anorectal Malformation (ARM) is one of the common congenital anomalies in the world.<sup>1</sup> No specific cause of anorectal malformation has been described.<sup>2</sup> Incidence worldwide is 1 in 3000 to 5000 live births.<sup>2,3</sup> The condition is more common in certain geographic areas.<sup>2</sup> In addition, imperforate anus occurs in association with several syndromes. A slight male preponderance exists.<sup>2</sup> The most common defect in females is rectovestibular fistula, whereas the most common defect in males is rectourethral fistula. Cloacal malformations are more common than formerly thought.<sup>2</sup>

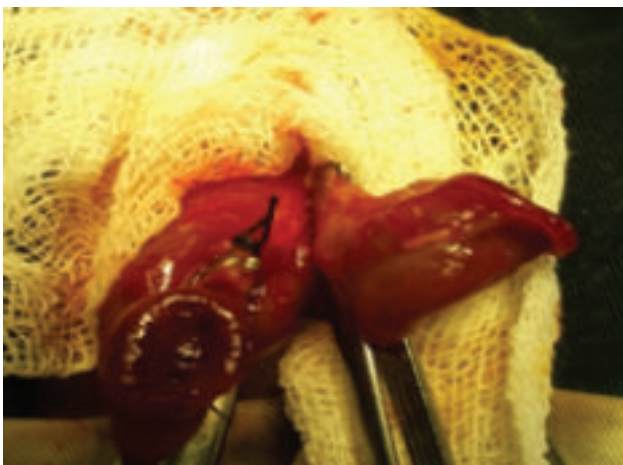
There have been many surgical techniques to repair anorectal malformations. These include endorectal dissection, anterior perineal approaches and many different types of anoplasties. Most pediatric surgeons now use the posterior sagittal approach with or without laparotomy or laparoscopy to repair these malformations.<sup>4</sup> Trans-fistula anorectoplasty also done for anorectovestibular fistula in female neonate.<sup>5,6</sup> Colostomy is usually performed as a first stage in a new born with high anomaly. A descending colostomy is a relatively trouble-free stoma. It also leaves the sigmoid colon entirely free for reconstruction.<sup>2</sup> A loop colostomy is defined when the bowel wall continuity is partially preserved.<sup>7</sup> A divided colostomy is defined when bowel continuity is completely disrupted regardless of the distance between the proximal and the distal ends of the stoma.<sup>7</sup>

A divided and separated proximal sigmoid colostomy is recommended by Pena.<sup>8-10</sup> Loop colostomies are used by many surgeons perhaps because they can be opened and closed quickly. Loop colostomies lead to urinary tract infections, distal fecal impaction, retraction and prolapse. Prolapse is a potentially dangerous condition.<sup>11</sup> Several special operative

techniques have been described to decrease prolapse, like skin bridge, subcutaneous tunnel for bowel exit, purse-string sutures at the fascial level and an anchoring U stitch. Skin excoriation, wound infection, stomal bleeding is almost same in both groups.<sup>12</sup> On this background, a randomized controlled trial was done to compare the outcome between divided and loop sigmoid colostomy in the management of anorectal malformation (ARM).

## Materials and Methods

This was a prospective study held in The Division of Pediatric Surgery, Dhaka Shishu (Children) Hospital, Dhaka from January 2014 to December 2015. Ethical permission was taken from the ethical committee. Informed consent was obtained after proper counseling with the guardian. Variety of ARM was diagnosed by an X-ray prone cross table lateral view with elevated buttock after 24 hours of birth for those patients where no fistulous tract was identified. Patients with ARM who required colostomy up to the age of 7 days were included in this study. Pouch colon syndrome, VACTERL association, intestinal perforation, septicemia and DIC, other gross congenital anomalies, parents/guardian refusal in participation were excluded. All the selected patients complete blood count, bleeding time, clotting time, blood group and Rh typing, serum creatinine, serum electrolytes, random blood sugar was done. USG of KUB region was done to see any renal anomaly, Plain X-ray of abdomen in erect posture and Echo cardiogram also done when required. After careful evaluation of the study cases with physical findings and imaging techniques the variety of ARM was assessed and a treatment plan was set up accordingly. They were randomly assigned to the divided colostomy group (group I=35 neonates) and loop colostomy group (group II=35 neonates).



**Fig 1** Divided colostomy (Group I)



**Fig 2** Loop colostomy (Group II)

All patients were kept nothing per oral for 1<sup>st</sup> post operative day (POD) with intravenous fluid supplementation (quarter to half strength normal saline with 10% dextrose according to requirement) and paracetamol suppository. Appearance, body temperature, abdominal distension, urination, condition of the stoma and condition of the wound was assessed. From 2<sup>nd</sup>, 3<sup>rd</sup> POD, breast milk along with IV fluid were infused according to the requirement. They were also advised to apply zinc oxide paste 40% around the stoma frequently and use stoma appliance. From 3<sup>rd</sup> -5<sup>th</sup> POD only breast milk were recommended. All the patients were discharged on 6<sup>th</sup> POD with the advices about care of the stoma, functional status of the stoma, condition of the stoma, condition of the wound, condition of the parastomal skin. All the patients were advised to attend in the operation theatre on 2<sup>nd</sup>, 4<sup>th</sup> and 8<sup>th</sup> week after operation. In each follow up clinical assessment was done regarding feeding history, color of stoma, wound infection, skin excoriation, prolapse or retraction of colostomy and parastomal hernia. After completion of data collection, to maintain consistency, the data were checked and edited manually and verified before tabulation. The statistical analysis was conducted using SPSS (statistical package for social science) version 20 statistical software. The findings of the study were presented by frequency, percentage in tables. Means and standard deviations for continuous variables and frequency distributions for categorical variables were used to describe the characteristics of the total sample. Associations of continuous data were assessed using student t- test. Associations of categorical data were assessed using Chi-square test and Fisher exact test. For both test,  $p < 0.05$  was considered significant.

## Results

In group I, the mean age of participants was  $2.37 \pm 1.33$  days and in group II, the mean age of participants was  $2.69 \pm 1.68$  days. In both group median was 2, P value was 0.388 (t-test). The mean operation time of group I was  $41.91 \pm 2.99$  and group II was  $30.31 \pm 2.98$ , P value was 0.0001 (t-test). In both groups, 31 (88.6%) were term babies, P value was 1.000 (Fisher exact test). In group I, the mean birth weight of participants was  $2.59 \pm 0.24$  kg where the range was 2.2 kg to 3.1 kg. In group II, the mean birth weight of participants was  $2.66 \pm 0.25$  kg where the range was 2.1 kg to 3.1 kg. P value was 0.248 (t-test). Fistula was absent in 21 (60.0%) cases in group I where as in group II, 25 (71.4%) participants had no fistula.

Associated anomaly was absent in 28 (80.0%) cases in group I where as in group 2, 29 (82.9%) had no associated anomaly, P value was 0.759 (Pearson's Chi-square test) [Table I]. In group I, 10 (28.6%) participants developed skin excoriation (Fig 3) and in group II, 11 (31.4%) participants developed skin excoriation, P value was 0.794 (Pearson's Chi-square test). In group 1, only 2 (5.7%) patients developed wound infection (Fig.3) where as in group II, no patient developed wound infection, P value was 0.493 (Fisher exact test). In group I, no patient developed prolapse of colostomy where as in group II, 5 (14.3%) patients developed prolapse of colostomy (Fig 4), P value was significant (0.054). In group I, no patient developed retraction of colostomy where as in group II, only 2 (5.7%) patients developed retraction of colostomy (Fig.4). P value was 0.493 (Fisher exact test). No patient developed parastomal hernia in any group.

**Table I**  
*Clinical details of patients*

Variable	Divided	Loop	Total	P-value
Sex				
Male, n (%)	20(57.1)	19(54.3)	39(55.7)	-
Gestational age				
Term	31(88.6)	31(88.6)	62(88.6)	1.000
Preterm	4(11.4)	4(11.4)	8(11.4)	
Birth weight (median)	2.5	2.7		0.248
Age(mean)	$2.37 \pm 1.33$	$2.69 \pm 1.68$		0.388
Fistula				
Absent	21(60.0)	25(71.4)	46(65.7)	0.313
Present	14(40.0)	10(28.6)	24(34.2)	
Associated anomalies				
Absent	28(80.0)	29(82.9)	57(81.5)	0.759
Present	7(20.0)	6(17.1)	13(18.6)	

**Table II**  
*Stoma related complications*

Type of complications	Divided	Loop	Total	P value
Skin excoriation, n (%)	10(28.6)	11(31.4)	21(30.0)	0.794
Wound infection, n (%)	2(5.7)	0(0.0)	2(2.9)	=0.493
Prolapse	0(0.0)	5(14.3)	5(7.2)	0.054
Retraction	0(0.0)	2(5.7)	2(2.9)	0.493
Parastomal hernia	—	—	—	—

**Table III**  
*Comparison of operation time between two groups*

Operation time (in minutes)	Group-I (n=35)	Group-2 (n=35)	P value
Mean ± SD	41.91± 2.99	30.31± 2.98	0.0001



A. Healthy



B. Skin excoriation



C. wound infection

**Fig 3** Dividing Colostomy



A. Healthy



B. Colostomy Retraction



C. Colostomy Prolapse

**Fig 4** Loop Colostomy

## Discussion

In most of the ARM patients, colostomy is performed as a temporary procedure before a full surgical correction of the malformation and is carried out soon after birth. A variety of complications, some of which have a high incidence, have been reported after colostomy formation in infancy.<sup>13</sup>

Though there are several procedures for colostomy, but in this research, sigmoid colostomy was taken into account. It can be done as loop and divided colostomy. Normally, pediatric surgeons perform loop sigmoid colostomy as it is easy to perform.<sup>11</sup> Wilkins and Pena as well as others recommended a divided colostomy at the junction of the descending and sigmoid colon. It is a smaller, more manageable stoma with a decreased tendency to prolapsed.<sup>13</sup>

A total of 70 neonates with ARM, were included in the study after fulfilling the selection criteria. They were randomly assigned into two groups- group I (divided colostomy) and group II (loop colostomy). Then the assigned colostomy was made to the newborn. After the operation the patients were followed up for 2 months as the definitive surgery usually done after 2 to 3 months.<sup>2</sup>

In this study, participants were taken within 7 days of age as it was evident in the study place that the increasing age increases the chances of developing complications like sepsis, DIC, perforation etc.<sup>8</sup> In group I, the mean age of participants was  $2.37 \pm 1.33$  days, and in group II, the mean age of participants was  $2.69 \pm 1.68$  days. There was no significant difference between ages of two groups as the p value was 0.388 (obtained by t-test). In this study, in both groups majority of the participants were male. In group I, 20 (57.1%) participants were male and in group II, 19 (54.3%) participants were male. This result was consistent with other studies where they also found a slight male preponderance.<sup>2,8,14</sup> In both groups, 31 (88.6%) of the participants were term babies. There was no significant difference between gestational ages of two groups as the p value was 1.000 (obtained by chi-square test).

In group I, the mean birth weight of participants was  $2.59 \pm 0.24$  kg where the range was from 2.2 kg to 3.1 kg. In group II, the mean birth weight of participants was  $2.66 \pm 0.25$  kg where the range was from 2.1 kg to 3.1 kg. There was no significant difference between birth weights of two groups as the p value was 0.248 (obtained by t-test). In the

current study, fistula were absent in 21 (60.0%) cases in group I where as in group II, (71.4%) participants had no fistula. Where fistula found, female neonates had rectovestibular fistula and male neonates had rectourinary fistula. This result was consistent with other studies where the most common defect in females was rectovestibular fistula, whereas the most common defect in males was rectourethral fistula.<sup>2,8,14</sup>

In the present study 28 (80.0%) cases in group I, where as in group II, 29 (82.9%) had no associated anomaly. This result did not match with other studies regarding ARM, as the study participants were selected purposively, gross congenital anomalies and VACTERL association were not included in this study. There was no statistical association between two groups as the p value was 0.759 (>0.05) which was obtained from Pearson's Chi-square test. In this study, it was found that the mean operation time in group I was  $41.91 \pm 2.99$  minutes and in group II it was  $30.31 \pm 2.98$  minutes. The statistical difference between these two groups was highly significant as the p value was 0.0001.

The operation time was more in group I, because the incision was large, the colon was separated completely and was fixed separately in the two ends of the incision. In between the colostomy loops the repair was done in three layers. It is noted here that there was no operation time mentioned in any literature while comparing the two types of operation.

Skin excoriation is a common problem after colostomy. It is caused by the stool contact with the surrounding skin. A study conducted in India found 30.2% skin excoriation in their study.<sup>12</sup> In the present study, skin excoriation was absent in majority of cases. In group I, 10 (28.6%) participants developed skin excoriation and in group II, 11 (31.4%) participants developed skin excoriation. There was no statistical association between two groups regarding skin excoriation as the p value was 0.794 (>0.05) which was obtained from Pearson's Chi-square test. In this study only sigmoid colostomy was fashioned. Formed stool came through sigmoid colostomy which was less irritant and did not pass frequently like those of transverse colostomy. Skin excoriation was also consistent with Sheikh et al. 25.0%.<sup>15</sup> In group I, only 2 (5.7%) patients developed wound infection where as in group II, no patient developed wound infection. There was no statistical

association between two groups regarding developing wound infection as the p value was 0.493(>0.05) which was obtained from Fisher exact test. As colostomy involves internal organ(colon), the risk of surgical site infection is less than 10%.

In the current study, in group I, no patient developed prolapse of colostomy where as in group II, 5 (14.3%) patients developed prolapse of colostomy. There was border line statistical association between the two groups regarding developing prolapse of colostomy as the p value was 0.054(<0.05) which was obtained from Fisher exact test. A study was conducted to compare the outcome of loop colostomy and divided colostomy where prolapse developed in 17.8% cases of loop colostomy and 2.8% cases of divided colostomy and the result was statistically significant(0.005).<sup>7</sup> Prolapse of stoma occurs when the stoma is opened in a mobile portion of the colon<sup>9</sup>. In divided colostomy proximal stoma was opened in proximal most sigmoid colon immediately distal to descending colon and the distal colostomy was done in mobile portion but it was done small and flat to prevent prolapsed.<sup>9</sup>

In the current study, in group I, no patient developed retraction of colostomy where as in group II, only 2 (5.7%) patients developed retraction of colostomy. There was no statistical association between two groups regarding developing retraction of colostomy as the P value was 0.493(>0.05) which was obtained from Fisher exact test. This result was consistent with other study where retraction occurred in 1.4% cases of loop colostomy and 4.2% cases of divided colostomy with a p value of 0.363.<sup>7</sup> Retraction of colostomy did not occurred in group-I (divided colostomy) due to proper fixation of the colon with the peritoneum, muscle and skin and the distal mucous fistula small and flat. But in group II distal stoma was dilated and it cannot be made small as it was continuous with the proximal stoma. When dilatation subsided stoma became retracted. After operation no patient developed parastomal hernia in any group in the present study. This result was also consistent with other study where parastomal hernia occurred in 3% cases of loop colostomy and in divided colostomy no patient developed parastomal hernia.<sup>7</sup>

### Conclusion

Loop sigmoid colostomies were found to be associated with a higher incidence of prolapse than divided

sigmoid colostomies. Though operation time was significantly more in dividing colostomy than in loop colostomy but skin excoriation, wound infection, retraction of colostomy and parastomal hernia was same in both groups.

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## ORIGINAL ARTICLE

# Limited Urethral Mobilization (LUM) Technique for Repair of Distal Penile Hypospadias: Experiences of tertiary care paediatric Hospital

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### Abstract

**Background:** Hypospadias has a wide spectrum of penile abnormality requiring surgical correction. Most of the cases are of anterior variety and the surgical technique depends on constructing neourethra but Limited urethral mobilization (LUM) technique depends on the natural elasticity of the urethra instead of constructing neourethra.

**Objective:** To see the outcome of Limited urethral mobilization (LUM) technique in distal penile hypospadias correction.

**Methods:** Total 66 patients were operated by LUM technique during 2 year 6 months' time. The urethra proximal to the meatus was mobilized for a distance sufficient to perform tension free urethroglandular anastomosis. Operation duration, meatus to glans tip distance, length of mobilize urethra and post operative complications were noted.

**Results:** The mean age of the patients were  $24.32 \pm 13.82$  months, ranges from 6.5 to 65 months. Mean operation time was  $50.94 \pm 22.32$  minutes, mean meatus to glans tip distance was  $7.57 \pm 1.35$  mm, mean length of mobilize urethra was  $25.99 \pm 8.96$  mm. One (1.54%) patient of our series develop urethrocutaneous fistula, 2 (3.08%) patients develop meatal stenosis and 2 patients developed post operative persistent chordee.

**Conclusion:** LUM technique is effective and useful in distal hypospadias repair. Instead of forming neourethra LUM technique depends on the elasticity of natural urethra so there is less chance of post operative urethrocutaneous fistula formation with good functional and cosmetic result.

**Key words:** Hypospadias, Limited urethral mobilization (LUM).

### Introduction

Hypospadias may be defined as an arrest in normal development of urethra foreskin and ventral surface of penis.<sup>1</sup> It occurs 1 in 125 live male births.<sup>2,3</sup> This results in a wide range of abnormalities; the urethral opening can be anywhere along the ventral shaft of

the penis, within the scrotum, or even in the perineum but the majority are distal or anterior variety with an incidence of 75%.<sup>4</sup> There are five basic objectives of hypospadias surgery which include Orthoplasty (Penile straightening), urethroplasty, meatoplasty and gladuloplasty, scrotoplasty and skin

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coverage.<sup>1</sup> The success of the operation is determined by excellent cosmetic appearance and voiding straight forward in standing position from the tip of the glans.<sup>1,4</sup> More than 300 procedures has been described in literature.<sup>5</sup> This reflects the variation of the anomaly and no procedure is versatile to correct hypospadias.<sup>1,5</sup>

There are lots of procedures applicable for distal hypospadias correction like Tubularized incised plate (TIP) urethroplasty, MAGPI, glandular approximation (GAP); but each and every procedure has pros and cons. Any technique to repair distal hypospadias should be simple, easy and applicable with good cosmetic and functional results. Herein, we report 66 patients with distal hypospadias who were operated by Limited Urethral Mobilization (LUM) technique.

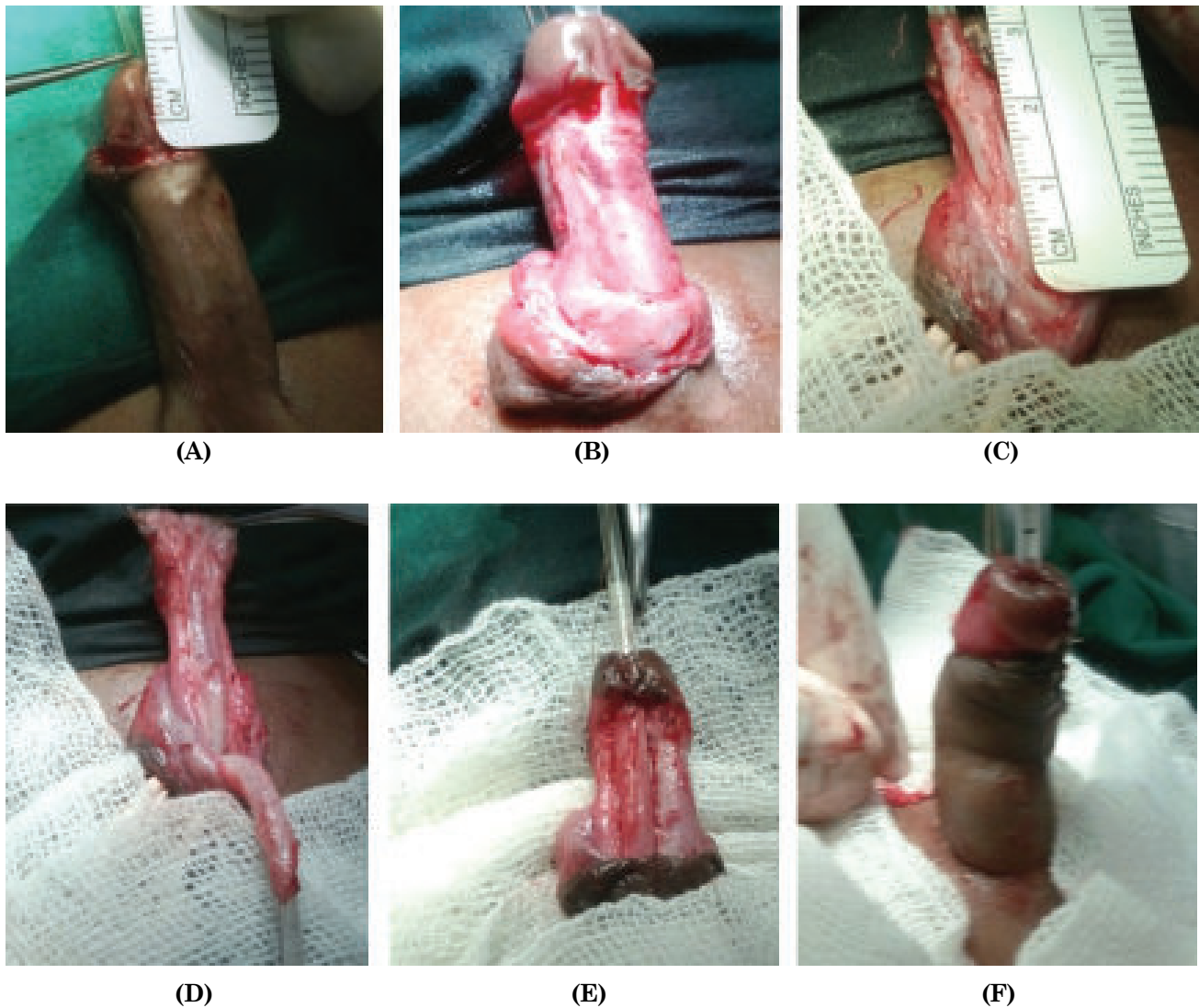
### Materials and methods

This was a prospective interventional study conducted in the department of paediatric surgery, Dhaka Shishu (Children) Hospital, Dhaka, Bangladesh. We have operated 66 cases from January 2012 to July 2016. Patients aged from 6 months to 18 years were included in the study. Patients refused to include in the study or with other life threatening associated congenital anomalies were excluded from the study. No redo cases were included in this study. Urethrocuteaneous fistula formation, persistent chordee, operation time, postoperative meatal stenosis were taken as outcome variables. This study was approved by the ethical committee of Dhaka Shishu (Children) Hospital, more over prior to operation parents were briefed about the procedure and probable complication to obtain informed consent.

After anaesthetic induction antiseptic wash and aseptic draping done. Prepuccial skin was released from the glans if required. Then tip of the glans to hypospadiac opening distance was measured by scale. Incision lines were outlined and marked with sterile marker. A tourniquet was applied and artificial erection test was performed to exclude chordee. If there is existence of chordee penile skin was degloved upto the base of the penis and all the dysplastic tissue was removed. A suitable sized silicon tube (BMI feeding tube 6 to 8 Fr) was introduced through the hypospadiac opening. The meatus was circumscribed and the urethra proximal to the meatus was mobilized circumferentially upto

a distance sufficient to allow the urethra to reach the tip of the glans. In the presence of laterally diverging corpus spongiosum, we extended our circumferential dissection laterally in order to contain as much spongiosum as possible. Obviously in some patients having all the spongiosum in incision border is not manageable, thus some spongiosum left attached to the corpora cavernosa. The length of mobilized urethra was measured and recorded. If there was a thin transparent urethra, we lengthened the mobilization as this thin portion would be excised after repositioning and securing the urethra within the glans wings. If the thin portion was more than 3-4 mm then we switched to other technique. The ventral glans was incised deeply in corpora cavernosa as like Y-V glanduloplasty and glans wings were mobilized laterally. The glandular bed was prepared and mobilized urethra was placed in it. The dorsal lip of the urethra was sutured to the glans tip with 6/0 non braided vicryl (polyglactin 910) with four interrupted suture. Glans wings were wrapped around the urethra as in normal configuration and sutured with 2 layers of interrupted subepithelial with with 6/0 non braided vicryl (polyglactin 910). The deeper layer secured the urethra with glandular tissue and superficial layer approximated the glandular tissue. The anterior lip of the urethra was fixed with the glans with 4 interrupted 6/0 non braided vicryl (polyglactin 910). Penile tourniquet which was intermittently used was removed just after completion of glandular reconstruction. Skin coverage was done either by ventral parking of prepuccial skin or by conventional method of circumcision in whom prepuce is complete. An urethral catheter (BMI feeding tube 6-8 Fr) was left in situ for at least 5 days. If the catheter was dislodged before 5 days and the patient was able to void then no catheter was reintroduced. If patient is not able to void then a catheter was re introduced with utmost caution. Otherwise catheter was left in situ for 5 days. On 5th post operative day diversion was removed and patient was discharged after voiding. To prevent bladder spasm we used oral oxybutynin 0.2 mg /kg/day in 2 divided dose.

On 15<sup>th</sup> POD urethral calibration was performed by 6- 8 Fr BMI feeding tube. 6 Fr for child less than 3 years and 8 Fr for older children. Urethral calibration was re checked after 1 month from 1<sup>st</sup> follow up. Finally patients were advised to come on post operative 6<sup>th</sup> month to assess the cosmetic appearance. Cosmesis was determined by straight penis with conical shape glans and vertically placed slit like meatus. Data was collected and analyzed.

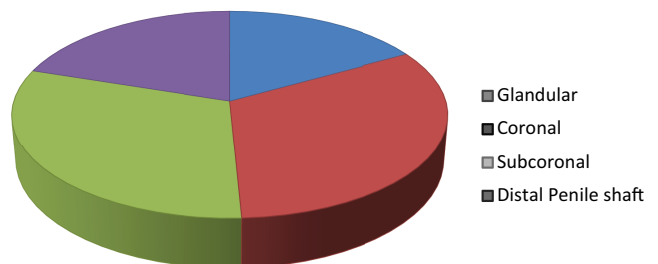


**Fig 1** Showing the steps of LUM technique. **A-** Measurement of defect, **B-** Degloving of skin and chordee correction, **C-** Measurement of urethra, **D-** Urethra mobilized, **E-** Urethroglanular anastomosis, **F-** Skin coverage.

### Results

The mean age of the patients were  $24.32 \pm 13.82$  months with the age range of 6.5 to 65 months (Table-I). Among 66 patients 11 (16.92%) patients were glandular, 21 (32.3%) were coronal, 20 (30.77%) were subcoronal and 13 (20%) were distal penile shaft variety hypospadias (Fig 1).

The mean distance required for carrying the urethral meatus to the glans tip was  $7.57 \pm 1.35$  mm with the range of 4-10.3 mm. The length of the mobilized urethra was  $25.99 \pm 8.96$  mm with the range of 14-34 mm. The ratio of the length of the mobilized urethra to the distance required for carrying the urethral meatus to the glans tip was 3.42. The mean operation



**Fig 1** Pie chart showing variety of hypospadias among study group.

time was  $58.30 \pm 4.92$  minutes. The mean catheter stay period was  $4.48 \pm 1.45$  days (Table-II). In this series 1(1.54%) patient developed urethrocutaneous fistula. On the other hand 2 (3.08 %) patient developed post operative chordee and 2 (3.08%) developed post operative meatal stenosis (Table-III).

**Table I***Age distribution among study population*

Variables	Results
Age in month $\pm$ SD	24.32 $\pm$ 13.82 months
Range	6.5 to 65 months

**Table II***Over view of the results of the study*

Variables	Results
Tip of the glans to ectopic meatal distance	7.57 $\pm$ 1.35 mm
Length of mobilized urethra	25.99 $\pm$ 8.96 mm
Operation time	58.30 $\pm$ 4.92 minutes
Catheter stay period	4.48 $\pm$ 1.45 days

**Table III***Complications of LUM technique*

Variables	Results
Urethrocutaneous fistula among patients	1 (1.54%)
Meatal stenosis	2 (3.08%)
Post operative persistent chordee	2 (3.08%)

## Discussion

Urethral advancement for hypospadias repair was first introduced in 1898 by Beck.<sup>6</sup> Utilization of Beck's technique was not consistently successful because of high rate of post operative fistula and chordee due to inadequate mobilization of the urethra.<sup>11</sup> After that numerous techniques has been used for urethral advancement.<sup>7-9,13,14</sup> Koff et al<sup>15</sup> modified the technique which brought satisfactory result. In 1999 Türken et al<sup>14</sup> reported successful results in patients who were operated on with limited urethral mobilization (LUM) and eccentric circummeatal-based skin flap technique. This

technique was based on the mobilization of the urethra with an eccentric circummeatal-based skin flap and glanular reconstruction by repositioning of the mobilized urethra in the glandular bed.<sup>4,14</sup> Utilization of an eccentric circummeatal based skin flap integrated to the LUM technique was a preventive measure to preserve the blood supply of the distal urethra.<sup>4,14</sup> Our technique did not comprise skin flap use; and instead meticulous mobilization of the distal urethra was performed. It is known that there is a fine network between the urethral branch of the internal pudendal artery and terminal branches of the dorsal penile artery, which creates an important vasculature for the urethra.<sup>16</sup> Thus, the fear of devascularization due to urethral mobilization seems to be unfounded.<sup>10</sup> In the present series all patient were advised to attend OPD for follow up and 1 patient were identified having meatal stenosis which was treated with meatal dilatation with 8 or 10 Fr soft silicon tube. One patient of our series developed postoperative fistula which developed on 16 th POD. It was the 1<sup>st</sup> case of our series. However the meatal stenosis might be the result of poor vascularity of distal thin urethra and the fistula might be the result of inadequate exposure to the new technique and post operative wound infection due to our hot, humid and dusty weather. Evidently, the dual blood supply of the urethra prevented necrosis of the distal part, which would have caused a fibrotic stricture of the newly created meatus.<sup>5,16</sup> Performance of V-Y or "Z" incisions of the glanular tissue, which were reported to decrease the post-operative stenosis rate, may be incorporated in the technique for obtaining a wider orifices.<sup>17,18</sup> Our stenosis rate (3.08%) was a bit higher than the previously reported similar series.<sup>2,6,13</sup> But much less lower than the other procedures to be comparable with previously reported similar series.<sup>4,13,19</sup>

Many different techniques are used to correct the distal hypospadias, especially in types confined to the glanular and coronal region. The MAGPI technique, which was favored for these cases, has sometimes difficulty in correction of the chordee.<sup>20,21</sup> As reported before, the LUM technique relieves glanular chordee by mobilizing the urethra into the glans.<sup>11,13,14</sup> We also performed midline dorsal placcation with unabsorbable suture (poly propylene) in patients whom degloving the penile skin is not sufficient to correct the chordee. The technique of

chordee correction by mobilization of the distal urethra is simple and effective. Also, unsatisfactory cosmesis with retraction of newly constructed urethral meatus related to MAGPI repair is resolved with the use of the LUM technique.<sup>11,20,21</sup>

The ratio of the length of the mobilized urethra to the distance required for carrying the urethral meatus to the glans tip was 3.42:1. Thus our study reveals that a 3.3 to 3.4 fold mobilization is sufficient to secure tension free urethroglandular anastomosis. This is very near to the data presented by Levent et al<sup>22</sup>. Atala et al<sup>11</sup> proposed that a 4 to 5:1 ratio should have been achieved between the mobilized length of the urethra and the initial distance from the meatus to the distal margin of the glanular groove to prevent chordee in urethral mobilization. Interestingly, the data from the present study reveal that a shorter mobilization length can also provide secure urethra-glandular anastomosis without chordee; and closely resembles the findings of Hammouda et al<sup>23</sup> and Levent et al<sup>22</sup>, who found that a three fold urethral mobilization was sufficient.

Fifty two patients had a slit like meatus at the tip of the glans. The rest of the patients had round shape appearance of the meatus with acceptable cosmetic results. These patients were the early cases of our series. We believe that this condition was due to insufficiency in dissection during mobilization of the urethra and inadequate preparation of the glanular bed as described before.<sup>4,5,11</sup>

The present study has two limitations due to certain technical aspects. Firstly, the use of the LUM technique in proximal hypospadias is questionable. The natural elasticity of the urethra is the main factor for using this technique and the continuing growth of the spongy urethra keeps pace with the general growth of the child.<sup>5,10,11 24</sup> The LUM repair in distal hypospadias offers a relatively risk-free opportunity to advance the urethral meatus to the glans tip without constructing a neourethra, thus reducing the risk of fistula formation.<sup>10</sup>

Secondly presence of a thin transparent urethra proximal to the meatus. In this cases we mobilize the urethra a little bit more and excise the thin portion after fixing and securing the urethra in the glandular bed.

### Conclusion

LUM technique is effective and useful in distal

hypospadias repair. Instead of forming neourethra LUM technique depends on the elasticity of natural urethra so there is less chance of post operative urethrocutaneous fistula formation with good functional and cosmetic result.

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## REVIEW ARTICLE

# Palliative Care in Pediatric Oncology

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### Abstract

*Palliative care for children with life-threatening conditions is the active total care of the child's body, mind and spirit and it also involves giving support to the family. It is immensely important to integrate the service with the curative approach of care. As the outcome of the cancer treatment is not always possible to predict it should be integrated to the service from the very outset as the diagnosis is reached. It is a multidisciplinary approach. Interdisciplinary communication is necessary to establish to address the physical, emotional, and spiritual needs of the child, parents, siblings and community. Communication is an important part and so "Breaking bad news" should be taken with utmost care and knowledge about the standard recommended approach. Because of the age of the patients in pediatrics ethical and legal considerations are to be respected and anything planned or to be done should be aimed at the betterment of the affected children. Pediatric Intensive Care Unit (PICU) is an important place to deliver the service to these children when they are critically ill or they are in need of the end of life care support. Different physicians, various other care givers, a lot of persons around are involved in the process. The whole affair is riddled with challenges. Not only the patients and parents but the care givers also pass through challenging times and stressful events. But with proper approach and improvement of the service can improve the art of achievement of the best quality service to the cancer children. It is essential that we understand about it, apply it and improve our quality of care.*

**Key words:** Palliative care, Pediatric oncology.

### Introduction

According to the World Health Organization (WHO), palliative care for children with life-threatening conditions is the active total care of the child's body, mind and spirit and it also involves giving support to the family.<sup>1</sup> It should be provided from the time of diagnosis of a life-limiting or life-threatening condition and should continue through life, death and bereavement. It is not confined to the terminal

phase of an illness and can co-exist alongside life-prolonging and life-saving treatments. Children who need palliative care referral may fall in four groups. Firstly, life-threatening conditions where curative treatment may be possible but may fail. Palliative care is needed in times of prognostic uncertainty or when cure becomes impossible. Secondly, Conditions where there are long periods of intensive treatment aimed at prolonging life, but where life expectancy is significantly reduced. Cystic fibrosis and acquired immune deficiency syndrome (AIDS) fit this pattern. Thirdly the progressive conditions where treatment is entirely palliative and may extend over many years. Neurodegenerative diseases and many inborn errors of metabolism are examples. Lastly, the irreversible but non-progressive conditions causing severe disability such as severe cerebral palsy.<sup>2</sup> In this review discussion will be kept confined to the palliative care to cancer ridden children only.

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### **Importance and need of palliative care in cancer**

Approximately 20% of children diagnosed with cancer eventually die of their disease. This makes cancer the leading cause of non-accidental death in childhood.<sup>3</sup> High quality palliative care is now an expected standard. The American Academy of Pediatrics set the following as a minimum standard for pediatric palliative care: Excellence in pediatric palliative care is essential for hospitals and other facilities caring for children. Program development in pediatric palliative care, along with community outreach and public education, must be a priority of tertiary care centers serving children.<sup>4</sup>

Since 1997, numerous organizations issued statements advocating for palliative care to be a part of comprehensive cancer care. In the United States, the Institute of medicine published a series of documents characterizing the role of palliative cancer care within comprehensive cancer care. Internationally, the WHO as well as the International Narcotics Control Board and other agencies advocated for palliative care as an integral part of cancer care.<sup>5-7</sup> In 2005, the 58<sup>th</sup> World Health Assembly fully integrated palliative care into its resolution WHA58.22 to improve Cancer Prevention and control.<sup>8</sup> This resolution recognized palliative care as an essential component of comprehensive cancer care, equal to medical, surgical, and radiation oncology and urged member nations to fully integrate palliative care into their national cancer control programs. In 2006, the ASCO Board of directors approved an ASCO-European Society of Medical Oncology (ESMO) consensus statement on Quality cancer Care. This 10-point statement listed common goals to ensure access to, and the continuity of, high-quality cancer care. It included pain management, supportive, and palliative care.<sup>9</sup>

### **Integration of palliative care at the initiation of treatment**

As the outcome of the treatment in children with cancer is not always possible to predict because disease might not be responsive to cancer directed therapy and it is not always discernible to appreciate the exact way the disease might take its course to death, so some children may die suddenly and unexpectedly and some others may follow a fairly and steady decline. Most of the children with progressive cancer have the varying periods of chronic illness riddled by crises, one of which may

prove fatal.<sup>10</sup> In the context of such inappropriateness in predictability of cancer treatment palliative care may not be introduced until it is too late. Again, when the physicians and nurses focus only on life extending therapy, as opposed to concurrent integration of quality of life, patients and family are likely to be deprived of optimum level of care. Therefore, optimal care of the child with life-threatening illness requires recognition on the part of the care givers that it may not be certain about the possibility and timing of death of the child, but if death is a potential outcome, priority should tilt on palliative care.<sup>11</sup> Another aspect of introduction of palliative care early in the treatment is the pediatricians making delays to refer to a palliative care unit.<sup>12</sup> This again will cause abrupt transition from life-prolonging to symptom-oriented care.<sup>11</sup> Therefore, it is really important to begin palliative care as a part of the treatment from its very outset so that transition to predominantly comfort care occur gradually and smoothly. This approach is supported by the views of parents of children with cancer, who favor concurrent pursuit of cancer-directed therapy and optimizing child's quality of life.<sup>13,14</sup>

### **Interdisciplinary approach of the care**

Cancer care is best provided by the service of multidisciplinary care. Interdisciplinary communication is necessary to establish to address the physical, emotional, and spiritual needs of the child, parents, siblings and community. In fact, communication about a child's poor prognosis was more effective if a psychologist or social worker was involved in the child's care.<sup>15</sup> Families must be reassured that they are not alone, whether the child is cared for in the hospital or at home. To ensure all these service a trained interdisciplinary team is to be formed. The team should assess the long term needs of families and ensure continuity of service through the treatment period. This service can be highly meaningful if family oriented approach is adopted. This can help one in communication, intensive symptom management, psychosocial and spiritual support. This also should include care and counseling of siblings, friends and school peers.<sup>13</sup>

### **Breaking Bad News**

Bad news may be defined as any information with adversely and seriously affects an individual's view of his or her future. Bad news is always, however, in

the “eye of the beholder”, such that one cannot estimate the impact of the bad news until one has first determined the recipient’s expectations or understanding.<sup>15</sup> This is most frequently done by a physician, although it is a very stressful one to let the patient know about the truth and not shock the patient unusually or as minimum as possible.<sup>16,17</sup> Bad news should be broken in a standard recommended fashion. Firstly, the physician should arrange the interview with some privacy, involving the parents and any other person important to them (parents), sitting down relaxed, making the good connection with the parents and managing all the time constraints and interruptions. Secondly, patients or parents’ perception and understanding about the disease have to be assessed before starting the final verse. Thirdly, patient’s invitation should be obtained to start telling the bad news. Fourth, the telling of bad news better to start with a warning to reduce the chance of getting patient or parents shocked, telling them the facts but taking care so that they are not unduly hurt or disappointed and avoiding excessive bluntness. Fifth, patients’ emotions should be addressed and emotions should be taken care of with empathy. Sixth, it is better to ask the parents or patients if they are ready to discuss the treatment plan.<sup>18</sup>

### **Delivering Palliative Care**

One of the important things in palliative care delivery to the cancer children is communication. It encompasses discussion of palliative care with families and discussion with children. For optimum palliation service and open and ongoing discussion with the parents and the families should be established. When discussing palliative care with families sensitivity to and empathy for the child and the family’s concerns and readiness (time and timing), attunement their spoken and non-spoken cues, respect for their cultural and spiritual beliefs and a nonjudgmental attitude on the part of the care giver team are critical. The cancer child also should be brought into discussion. Considering the age of the child, the child the issues should be discussed. The points of decision making should also be discussed based on their development. It is important to remain open and receptive when the child initiates a conversation.<sup>19</sup>

### **Ethics and legal consideration of Palliative Care**

In pediatrics, where most patients lack decision making capacity, either because of their

developmental stage or their medical condition, decisions are made using the best interest standard.<sup>20</sup> The best interest standard means that the decision maker(s) must determine “the *net* benefit for the patient of each option.... The course of action to be followed, then, is the one with the greatest net benefit to the patient.”<sup>21</sup> Arriving at such decisions should result from a shared decision making process that involves the family, the patient when appropriate, and the medical team.<sup>22</sup> For most children in the United States, the legal medical decision makers are their parents or legal guardian(s). In the case of an emancipated minor, the patient himself or herself has the legal decision making authority.

Some of the most challenging and morally driven decisions in pediatrics involve end-of-life decisions, particularly decisions regarding the use of aggressive, potentially life-prolonging but burdensome therapies. The AAP endorses the withdrawing or withholding of burdensome therapies in the interest of maximizing a child’s quality of life. Specifically the AAP states: “Although a child’s life may be shortened by forgoing burdensome interventions or providing adequate sedation in the face of otherwise unrelieved symptoms, the goal of palliative care is to optimize the quality of the child’s experience rather than hasten death.”<sup>23</sup> Moreover, ethicists do not make a distinction between withdrawing (stopping once started) or withholding (not starting) potentially life-prolonging therapies. However, it can be challenging to apply these principles in real-life situations. Studies show that not all medical professionals agree with this accepted ethical concept.<sup>24</sup> Practically speaking, many families may simply perceive a difference between withdrawing vs. withholding a particular therapy. However, providing the best care for a particular patient may include withdrawing or withholding life-sustaining therapies, both ethically supportable practices.

The ED practitioner aims to support life through all possible means unless an advance directive requests otherwise. For patients who present in extremis and whose families later decide to limit aggressive life-prolonging therapies, it may be of some comfort for the emergency physician to remember that withdrawing life supporting therapies, such as intubation and mechanical ventilation, in the intensive care unit or even the ED, is ethically permissible provided that those therapies are not compatible with the best interests of the patient.<sup>25</sup>

The United States legal system also recognizes these ethical principles. The United States courts affirm that a parent should have the option of forgoing potentially futile therapies for his/her child. In 1983 the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research supported a parent's refusal of medical treatments in most instances. Additionally, the Commission declared that the parent is the person in the best position to make such decisions.<sup>25</sup>

As discussed above, management of palliative care patients often requires administration of opioids or sedative agents to manage pain and other distressing symptoms. In certain situations administering such agents are perceived by some as hastening death and concerns about practicing physician-assisted death may arise. We have already presented data that refutes the notion that administration of opiates and sedatives hastens death. But in looking at the issue from an ethical perspective, the Doctrine of Double Effect provides a helpful framework. The Doctrine of Double Effect states that it is permissible to cause harm as a side effect (the "double effect") of bringing about a good result given that certain criteria are met. Those criteria include: the treatment must have potential beneficial and harmful effects; the clinician *intends* the beneficial effect; the harmful effect is not necessary to achieve the beneficial effect; and the beneficial effect must outweigh the harmful effect (proportionality).<sup>26,27</sup> The law supports the obligation of physicians to alleviate pain and suffering and acknowledges the principal described by the Doctrine of Double Effect. In the 1997 United States Supreme Court case, *Vacco v. Quill*, Chief Justice Rehnquist wrote, "It is widely recognized that the provision of pain medication is ethically and professionally acceptable even when the treatment may hasten the patient's death if the medication is intended to alleviate pain and severe discomfort, not to cause death."<sup>25</sup> Thus it is morally incumbent and ethically and legally permissible to administer medications with the goal of providing pain and symptom relief.

### **The care in the Pediatric Intensive Care Unit**

Every year at least 200 children per 100,000 require hospitalization in PICUs because of serious illness including cancers.<sup>28</sup> Approximately 90% of pediatric deaths in the hospital occur in neonatal and pediatric intensive care units.<sup>29</sup> These settings are

characterized by their intensive technological focus on life-saving procedures such as the use of mechanical breathing assistance (ventilation), intensive intravenous (IV) administration of medications, and artificial hydration and nutrition supplementation. Most deaths in the PICU are preceded by withdrawal of life-prolonging medical therapy, most typically mechanical ventilation<sup>28</sup>, the removal of these can result in death from respiratory arrest within moments to hours.

In addition to the medical acuity of the cancer children seen in PICU settings, the organization of care in these units is also complex, especially from a family's perspective. Families and patients in these settings interact with multiple professional caregivers including physicians, nurses, pharmacists, nutritionists, child life specialists, respiratory therapists, social workers and depending on the child's condition, specialists from medical disciplines such as nephrology, cardiology, pulmonology, and oncology. Many PICUs are located in teaching hospitals where in addition to attending physicians, families may also encounter residents and fellows who rotate through the unit on a weekly or monthly basis. In the course of a 24-hour period, families may interact with dozens of medical professionals each of whom has some responsibility for the care of their child. They then may encounter a substantially new set of caregivers the next day. Care may not be well coordinated among these multiple services and disciplines and communication may be fragmented, thus affecting the family's ability to access appropriate information and to make informed decisions regarding the care of their child. While daily rounds in which the interdisciplinary professional team discusses the medical indications for treatment of the child are routine in PICUs, these conversations may or may not include family members. Even when family members are physically present, the usual purpose of the rounds is to review highly technical medical findings that are typically outside of most family members' understanding. Rarely are families invited into the conversation or given explanations about what each lab value, medication, or machine setting indicates. As a result, families often face challenges in obtaining information about their child's condition and care needs that is understandable to them. This difficulty becomes even more pronounced when medical teams are caring for children and families with limited English

language skills. When interpreters are available, they usually have to be requested in advance, so emergent changes in a child's condition may not be communicated to family members.<sup>29</sup>

A family-centered approach requires a core commitment to including patients and families as respected members of the health care team, and communicating with them in ways which elicit patient and family values, needs, and preferences.<sup>30</sup> For example, in response to parental concerns to have ongoing access to their child, many units have made provisions for parents to "room in" with their children in a more aesthetically appealing environment, rather than allowing only brief visitations each hour. These rooming-in arrangements support positive attachment and provide emotional security for the child. Rooming in can reduce the stress of travel for the parent and the stress of the hospital stay for the child and parent. Also, research suggests that such arrangements in pediatric care units can reduce parental stress caused by changes in the parental role that can occur during pediatric hospitalizations.<sup>31</sup>

In response to efforts to improve care in PICUs, several changes have been recommended to include families more directly in the care of their children, drawing on practice principles derived from models of "family-centered care," which is broadly focused on building partnerships between families and health care providers when caring for critically ill patients<sup>29</sup> have identified six domains that are central to family-centered care: (a) support of the family unit; (b) communication with the child and family about treatment goals and plans; (c) ethics and shared decision making; (d) relief of pain and other symptoms; (e) continuity of care; and (f) grief and bereavement support. The Society of Critical Care Medicine (SCCM) has developed clinical practice guidelines for the support of the patients and families in adult, pediatric, and neonatal ICUs.<sup>32</sup> These evidence-based guidelines address family psychosocial needs by recommending shared decision making; routine care conferences with families to explain the patient's medical condition and determine mutually agreed upon goals of care; cultural and spiritual support for patient and family; and family support before, during, and after a death. These guidelines recognize the need for inter-professional practice, and highlight the role that social workers can play in each of these areas. Yet, as discussed

below, changing ICU practice remains an ongoing challenge despite advances in the recognition of the importance of family-centered care.<sup>33</sup>

### **Stress factors for families with a critically ill child**

The serious illness and death of a child is one of the most disruptive events in a family's life experience, especially when the family is raising young children.<sup>34</sup> Research has documented that parents often have intense grief after the death of a child. Death in the PICU is often unexpected by parents who are hoping for recovery with use of aggressive therapies.<sup>35</sup> Complicated grief was found in 59% of parents whose child had died in the PICU, 6 months after the death.<sup>36</sup> The majority of parents (74%) report having experienced some resolution of their grief after the death of a child.<sup>37</sup> However, parents with unresolved grief reported significantly worsening psychological health and physical health compared with those who have experienced some resolution of their grief. Parental stress may also limit the emotional and physical availability of parents for other children in the home, particularly in response to sibling fears, concerns, and anxieties. For example, the more depressed or distressed the parent in dealing with the serious illness of a child, the less able the parent will be to act as a buffer for siblings; in such circumstances, the sibling may refrain from disclosing to parents or revealing emotions out of a strong desire not to burden other family members or add to others' distress.<sup>38, 39</sup>

Parents not only are caregivers for their children, but also are "second-order patients" themselves who require attention from PICU staff.<sup>40</sup> The PICU is an emotionally charged environment that places major demands on patients and family caregivers and can have negative effects on their short- and long-term psychosocial outcomes.<sup>41,42</sup> For example, Ballufi and Colleagues in 2004<sup>33</sup> assessed the prevalence of two anxiety disorders among parents caring for a child in a PICU. During the initial period of the PICU admission, about one third of the parents met symptom criteria for Acute Stress Disorder (ASD). Four months after the PICU discharge, 21% of parents met symptom criteria for Post-Traumatic Stress Disorder (PTSD). Nearly all parents experienced one or more of four types of symptoms associated with PTSD—including feelings of dissociation, re-experiencing the stressful event,

avoidance of the stressful event, or hyper-arousal. ASD rates were higher among parents who worried their child might die and for whom the admission was unexpected<sup>32</sup>, both of which are characteristic of children who may benefit from palliative care consultation.

Adding another layer of stress for parents are the conflicts that can arise regarding care decisions in the PICU. These decisions are typically made by parents because their children are cognitively and/or legally not able to make autonomous choices about the kind of care they receive. This structural difference between adult and pediatric care requires that communication in a pediatric environment be focused on family system functioning, not just the desires and goals of the patient. Perception of support is a key determinant in psychosocial outcomes for parents-including support given by clinicians<sup>43</sup>, PICU and other hospital staff, and family or friends.<sup>44</sup> However, in the only study specifically focused on the PICU setting, Studdert and colleagues (2003)<sup>42</sup> found serious disagreements in over one-half of the cases where children spent more than eight days in intensive care. Where there is conflict between staff and families, ethics consultations have been shown to be beneficial in adult environments.

The needs of families may not be recognized by the physicians charged with the care of seriously ill children because of different perspectives regarding which processes and outcomes are most important in PICU care. For example, one study found that families valued clear communication and compassionate support at the end of life more than pain management or length of stay. However, physicians prioritized technical aspects of pain management and length of stay as the most important factors.<sup>45</sup> Meyer and his colleagues in 2002 reported that over half of families in the PICU considered the possibility of withdrawing life-prolonging interventions before any such discussions were initiated by the medical team, and up to 25% of parents reported that, in retrospect, they would have made decisions differently than those that were recommended by staff concerning their child's care. Unfortunately, because of the power differentials and structures of the PICU settings, families remain at a disadvantage in negotiating care in the PICU. The PICU is still a very technologically focused environment and has yet to become a family-friendly

place despite a decade of study and dissemination of the concept of family-centered care in pediatrics. In this context, social workers can exercise crucial leadership to facilitate and enhance communication between parents and members of the medical team. Trained in addressing crisis and loss, social workers can also facilitate communication across the multiple services and members of the interdisciplinary palliative care team that are engaged in the care of the hospitalized child.<sup>46</sup>

### **Palliative care at the end of life of cancer patients in PICU**

The goal of palliative care is to improve quality of life by relieving pain and other distressing symptoms for patients and families facing life-threatening illness<sup>47</sup> and to assist patients and families in decision making about end-of-life care. Palliative care is family-centered support that includes physical, emotional, and spiritual comfort which is best provided by a multidisciplinary team that includes social workers, physicians, nurses, chaplains, and other health care professionals.<sup>48</sup> Patients are typically eligible for palliative care services from the time of diagnosis through death and into bereavement<sup>49</sup>; thus the mission of and services offered by palliative care can extend far beyond the typical 6-month prognosis used to determine eligibility for hospice by Medicare and most other private insurances in the United States. In addition, it is important to conceptualize palliative care as broader than end-of-life care. Although palliative care should be a component of end-of-life care, palliative care also includes care earlier in the disease trajectory focused on identifying the goals of care-including patient and family support for physical, emotional and spiritual issues that arise in the context of a potentially life-limiting illness. Hospital-based palliative care teams often function in a more consultative role, especially for the critically ill, rather than directly providing ongoing nursing or other direct patient care services. However, some palliative care programs are integrated with hospice teams and more direct patient care is provided. During the past decade, pediatric palliative care teams have grown in number. In developed countries hospital-based pediatric palliative care teams deal with a greater diversity of medical conditions and duration of survival than palliative care teams caring for adult patients.<sup>50</sup>

Both families and clinicians share the hope and expectation that ill or injured children will improve with aggressive care, so it is common that the unquestioned goal of care is to pursue every available option in the PICU. The desire to preserve and prolong life in the PICU has a heightened poignancy due to the youth of the patients and the feeling that they have not yet had their lives to live. In this respect, the PICU may have a greater focus on cure in contrast to the more varied strategies and goals that might be considered for older adults in ICUs. As a result, palliative care in pediatric intensive care settings has been slower to develop than in adult ICUs where the patient mix often includes a substantial number of elderly adults who may be facing the end of life as a normal and expected part of the human life course. Barriers to good palliative care from family perspectives include a primary focus on curative treatments dealing with a complex team of clinicians who are often not communicating consistent information, and the perception that decisions must be made quickly without enough time to absorb and act on changing situations.<sup>51</sup>

Integrating palliative care into the PICU setting can be challenging for both logistical and provider-oriented reasons. Studies of death in PICUs suggest that even though some children are in the PICU for months, the median length of stay is around one week.<sup>52</sup> Although one week is too short for optimal delivery of palliative care, even this short time can be used to incorporate palliative care consultation, particularly about goals of care and end-of-life decision making. However, children with serious chronic conditions may have multiple admissions to PICUs over the course of their illness. In these circumstances, families may benefit from palliative care that is offered in a more episodic fashion.

Communicating the prognosis of seriously or terminally ill children is a delicate process that can be more difficult in the milieu of the PICU. The uncertainty surrounding prognosis for many pediatric conditions poses another logistical issue in recognizing that end-of-life concerns should be addressed. Many pediatric cancer conditions have unclear trajectories, and given the focus on curative treatment, it can be difficult to raise the possibility of death when continued life and improved health are the hoped for outcomes.<sup>52</sup> Health care professionals trained in critical or intensive care often

feel personal discomfort when discussing quality-of-life or end-of-life issues and may therefore avoid or delay important conversations.<sup>53</sup> However, delaying such difficult conversations can result in missed opportunities for identification and resolution of emotional issues and for healing within the family. The prevailing style of clinician communication to family members is typically a physiologic systems approach, focusing on ventilator settings, incremental changes in laboratory values, and other highly technical data. This approach usually does not directly address the child's chances for survival or future level of functioning. Frequently, PICU clinicians engage in frank discussions about prognosis only after they judge the future quality of life as unacceptable, at which point they use this information to suggest discontinuation of life-prolonging interventions.<sup>54</sup>

Several studies have examined the health care providers' comfort and confidence levels in providing pediatric palliative care in the PICU. In general, the staff of PICUs felt less comfortable providing psychosocial care compared to other aspects of care.<sup>55</sup> Additionally, confidence in providing palliative care was significantly higher among physicians and nurses who had eight years or more of experience in the PICU.<sup>55</sup> These findings suggest that palliative care conversations are difficult for the clinicians directly engaged in the care of critically ill children in pediatric intensive care settings. Social workers who have training in discussing uncomfortable issues can help initiate these conversations when they are aware that there is uncertainty about the child's potential for recovery.

#### **Cancer Directed Therapy and Palliative care**

Many families opt for continued treatment of the underlying cancer even when there is no realistic prospect for cure.<sup>56,57</sup> Their rationale might include hoping for a miracle, a desire to extend the duration of the child's life even though there is no possibility of cure, or to palliate symptoms related to progressive disease. Generally decisions regarding continued cancer-directed therapy need to be carefully considered, weighing the potential for life extension and the impact on quality of life. A common conflict is commonly seen in advanced cancer care between life-extending measures and efforts to minimize global suffering. Palliative cancer therapy can prolong life and lessen suffering. Alternatively,

administration of treatments may result in increased numbers of physician-patient interactions, visits to clinic, admission to the hospital, and most important treatment-related complications requiring augmentations of supportive care. Nevertheless, several studies show improved quality of life among who were not.<sup>58,59</sup> For symptom relief palliative radiation is typically delivered in larger fraction sizes over shorter time frame.<sup>60,61</sup> Such single fraction regimens, when compared with multiple fraction regimens, provide equal palliation with lower medical societal costs.<sup>62</sup> However reimbursement issues remain a barrier to patients enrolled on hospice.<sup>63</sup>

### Care of the caregivers

The care of terminally ill children and their families is extremely rewarding. Yet, professional caregivers often experience distress in assort of parallel process to the families. The professional often feels anguish and helplessness in witnessing a child endure pain and suffering physical and psychic. In a recent survey staff cited the personal pain of losing a child as the most difficult experience in their work with dying children. There is a little doubt that repeated losses experienced by medical caregivers become a significant source of personal stress. Physicians are frequently unable to achieve the ideals embraced by holistic medical care, and when treatment fails and death is imminent, health care providers may question the meaning of their work. For all these reasons the professionals who engage in this extraordinarily rich and demanding work feel for significant needs to support themselves. Strategies useful in the prevention and management of stress include the encouragement of increased awareness of stress in self and colleagues, the clarification of appropriate goals and priorities, encouragement of appropriate limit setting, the clarification of team roles and organizational patterns, the establishment of team support meetings and favorable working condition, exercise, and the clarification and working through of previously unresolved personal psychodynamic issues. A cohesive team and the opportunity for consultation, psychotherapy and support groups are crucial for those who are intimately engaged in repeated cycles of attachment and loss with dying children and their families.<sup>64</sup>

### Conclusion

Palliative care is an integral part to improve the quality of service delivery to the cancer affected

children. Regardless of the children with end-of-life care support or not, palliative care is the essential part for the holistic approach towards comprehensive care of these ill-fated kids. Ethical and legal issues are to be known and applied appropriately. There are challenges and stress factors for patients, parents, relatives and the care givers too. With the better skill, finer approach and improved understandability about the care all concerned can improve to satisfy the objectives to alleviate the children so dreadfully affected with symptoms and stress of a disease like cancer. It is essential that we understand about it, apply it and improve our quality of care.

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## CASE REPORT

# Myeloid Sarcoma- A Case Report

SM Rashed Z Kabir<sup>1</sup>, Olia Sharmeen<sup>2</sup>, AK Ghosh<sup>2</sup>, AI Khan<sup>3</sup>

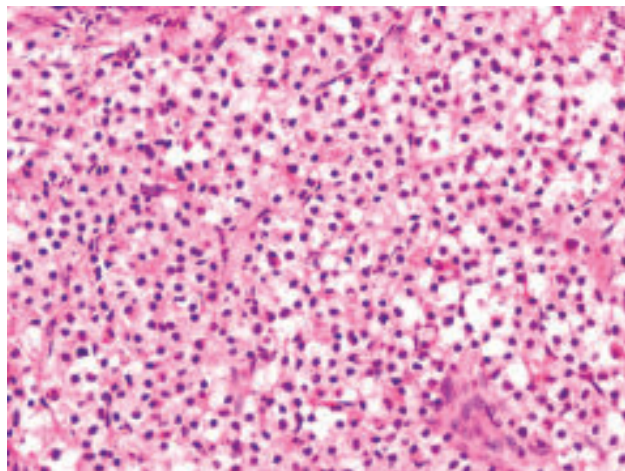
### Introduction

Myeloid sarcoma (MS) is a rare neoplastic condition consisting of immature myeloid cells and occurring at an extramedullary site that most frequently corresponds to the bone, skin, or lymph node, although any part of the body may be affected.<sup>1</sup> It arises de novo or is associated with other haematological disorders such as acute myeloid leukemia (AML), myelodysplastic syndrome (MDS) or myeloproliferative disorders (MPD).<sup>2</sup> MS may be the first manifestation of AML, preceding it by months or years, or equally represents the initial manifestation of relapse in a previously treated AML in remission.<sup>3</sup> If myeloid sarcoma occurs in a setting of MDS or MPD, it is equivalent to blast transformation.<sup>4</sup>

### Case report

A 7 years old male child developed swelling of his right eye. The swelling gradually increased for 6 months. For this reason his parents attended him in a well-equipped eye hospital. Different types of investigations were done like thyroid function test and CT scan of brain and orbit. CT scan revealed a space occupying lesion in brain. MRI of brain was done that unveiled a mass lesion in right temporal region with fibrous dysplasia of right sphenoid wings and proptosis of right eye ball. Right parietal craniotomy and near total removal of the tumour were done. Histopathological report confirmed the diagnosis as Myeloid Sarcoma. Most of the tumour cells were positive for myeloperoxidase stain. Some of them were positive for S-100. Then the patient was referred to National Institute of Cancer Research and Hospital (NICRH) for chemotherapy. In NICRH Complete blood count with peripheral blood film

showed no immature cells and Bone Marrow morphology reported normal active marrow.



**Fig 1** Histological picture of myeloid sarcoma

The patient was treated with Cytosine Arabinoside and Doxorubicin based induction chemotherapy (AML protocol). After two cycles of chemotherapy the patient developed neutropenia. All types of treatment of neutropenia were given but the patient died in spite of all measures available.

### Discussion

Myeloid (granulocytic) sarcoma is a tumor mass consisting of myeloid blasts with or without maturation, occurring at an anatomical site other than the bonemarrow.<sup>5</sup> It is also known as chloroma, myeloid sarcoma or extramedullary myeloid cell tumor. Very rarely it may occur without a known pre-existing or concomitant diagnosis of acute leukemia, acute promyelocytic leukemia or MDS/MPD. This is known as primary chloroma.<sup>6</sup> The

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common sites of occurrence are the subperiosteal bone structures of the skull, paranasal sinuses, sternum, ribs, vertebrae and pelvis; lymph nodes and skin are also not very uncommon.<sup>4</sup> Granulocytic sarcoma develops preferentially in bones or periosteum (especially in the skull) and it may lead to proptosis.<sup>7</sup> The proptosis in these cases is mainly caused by leukaemic infiltrates, a retrobulbar haemorrhage, an orbital muscle infiltration or a venous blockage.<sup>8</sup>

The WHO has classified Myeloid Sarcomas into 3 main types, depending on the degree of maturation (i) Blastic – which is composed mainly of myeloblasts (ii) Immature- which is composed of myeloblasts and promyelocytes and (iii) Differentiated- which is composed of promyelocytes and more mature myeloid cells.<sup>9,10</sup>

The diagnosis of a granulocytic sarcoma can be difficult and sometimes it may be misdiagnosed. These tumours can occur anywhere in the body and they have to be differentiated from lymphomas, carcinomas or infectious process.<sup>8</sup>

In this case, based on the locations of the tumours, special staining (MPO stain) and histopathological examination reports, Myeloid Sarcoma was considered a definitive diagnosis. At the end, the response to treatment with chemotherapy (AML Protocol) established the final diagnosis in this case as Myeloid Sarcoma.

### Conclusion

The conclusion can be drawn here that Myeloid Sarcoma does occur even without the pre-existent or concomitant Acute Myeloblastic Leukemia, Acute Promyelocytic Leukemia, Myelodysplastic Syndrome or Myeloproliferative disorders. It can be labelled as Primary Chloroma. The diagnosis can be established with clinical suspicion, hematological investigations and histopathological supports. It should be emphasized that the correct diagnosis and differentiation from other mimics are crucial to make an accurate diagnosis and appropriate treatment of the patient.

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## CASE REPORT

# Mixed Connective Tissue Disease

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### Introduction

Mixed connective tissue disease (MCTD) is a rare autoimmune disorder. It remained a controversial term among rheumatologists still now. Some question whether mixed connective tissue disease has its own specific criteria or whether it's a precursor to another connective tissue disease. However, MCTD is considered either an SLE-type disorder or variant of an overlap syndrome. Initially described by Sharp and colleagues in 1972 in 25 adults.<sup>1</sup> The central concept of MCTD is that of an "overlap syndrome" associated with anti-U1 RNP antibodies. Pediatric mixed connective tissue disease (MCTD) is rare and characterized by overlapping features of juvenile idiopathic arthritis (JIA), systemic lupus erythematosus (SLE), systemic sclerosis (SSc), and juvenile dermatomyositis/polymyositis (JDM/PM) in the presence of high titers of anti-U1 ribonucleoprotein antibodies (RNP).<sup>2,3</sup>

The symptoms of underlying disorders do not generally present simultaneously<sup>4</sup>. The features commonly appear sequentially over time. Often patients with mixed connective tissue disease are first diagnosed with lupus. As the disease progresses and other signs and symptoms become apparent, the disease is re-diagnosed with mixed connective tissue disease. Some patients begin with a diagnosis of connective tissue disease only later find they have lupus or another mixed connective tissue disorder. Thus, in early stages, MCTD is often considered as an undifferentiated connective tissue disease (UCTD). Features may evolve into any other recognizable condition over time.

The exact cause of MCTD is unknown. A genetic link can be seen in some individuals diagnosed with MCTD. There are ongoing studies exploring the development of this condition.<sup>5,6</sup> Exposures to certain chemicals or viruses such as silica or polyvinyl

chloride have also been found as important cause of MCTD<sup>7</sup>. There is no specific age of onset for MCTD. Based on reported pediatric cases, the median age of onset is 12 years. The youngest reported age at onset is 2 years. MCTD has a female predominance like other autoimmune diseases. Here we presented a case of MCTD who is undergoing regular follow up in the Department of Paediatric Rheumatology of Dhaka Shishu (Children) Hospital.

### Case Report

Maruf, an 11 year old boy, hailing from a lower Class family of urban Dhaka admitted with the complaints of pain in both knee joints for two months, fever and rashes over different sites of body for one and half months. Maruf's mother stated that he was well two months back. Then he developed pain in both knee joints which was initially associated with joint swelling. Joint pain was additive in nature and associated with morning stiffness more than 15 minutes. Maruf also developed rashes over different sites of body which was photosensitive, non-pruritic, non-tender. He had low grade intermittent fever (Highest recorded temperature was 100°F) for one and half months usually subsides by taking antipyretics. On query, mother stated that he has been losing weight for the last few months and suffering from painless oral ulcer and frequent hair fall.

For these complaints he visited to a local physician and took oral analgesics inappropriately for joint pain by which joint symptom was improved partially. There is no H/O hematuria, chest pain, breathing difficulty, behavioral change, and convulsion or taking any offending drugs.

Physical examination revealed Maruf was ill looking, co-operative, mildly pale. Anthropometrically he was underweight (BMI 11.57 kg/m<sup>2</sup> (<5<sup>th</sup> centile). He was

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afebrile, BCG mark present. Skin survey revealed multiple erythematous skin rashes of variable sizes on face, trunk and limbs. Rashes were mildly scaly, not palpable, non-tender, did not blanch on pressure, largest one (5x4cm) on the dorsal surface of neck. He had malar rash (Fig.1) which spared the naso labial fold and alopecia areata (Fig.2). There was no lymphadenopathy, no edema. Bed side urine for albumin was nil.

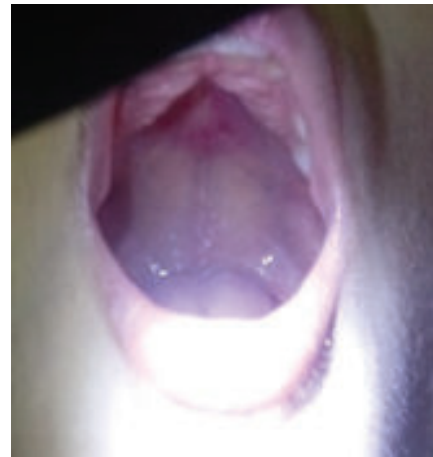


**Fig 1** Malar rash sparing naso-labial fold



**Fig 2** Alopecia areata

Alimentary system examination revealed he had painless oral ulcer on the hard palate (Fig.3). Abdomen was normal in shape without ascites. There was no organomegaly. Locomotor system examination revealed, arthralgia in both knee joints with grade 2 tenderness with mild restriction of movement on flexion. Other systemic examination revealed no abnormality.



**Fig 3** Oral ulcer on hard palate



**Fig 4** Maruf after 10 months of treatment

Investigations revealed normocytic normochromic anemia and leucopenia with high ESR (115mm in 1st hour). An extended infection screen was negative. 24 hours urinary total protein was 0.32gm. He had low complement C3 level and normal C4 level, positive Anti-Nuclear Antibodies (ANA) with speckled pattern, negative anti-double stranded DNA (ds DNA) antibodies; and positive anti-Ribonucleoprotein (RNP) antibodies (IgG-208 u/ml). He had negative anti cyclic citrullinated peptide antibodies (CCP)], negative rheumatoid factor and negative anti Sm antibody.

He was given oral steroids along with daily hydroxychloroquine (HCQ) tablets. Patient was discharged after 11<sup>th</sup> day of hospitalization. The skin lesions settled down and joints remained in remission on follow up. We planned to start subcutaneous methotrexate if joint symptoms recur.

**Table-I**  
*Diagnostic criteria for MCTD*

Sharp	Alarcón-Segovia	Kasukawa	Kahn
Major	Serological	Common symptoms	Serological
Severe myositis	Anti-U1RNP antibodies	RP	High titer anti-RNP
Lung involvement	at hemagglutination	Swollen fingers	with speckled ANA >
RP or esophageal	1:1600	SLE	1:2000 Clinical RP
hypomotility	Clinical	Polyarthritits	Synovitis
Swollen hands or	Swollen hands	Adenopathies	Myositis
sclerodactyly	Synovitis	Malar rash	Swollen fingers
Anti-ENA > 1:10,000	Myositis	Pericarditis orpleuritis	
	RP	Cytopenia	
	Acrosclerosis	SSc	
		Sclerodactyly	
		Restrictive lung Disease	
		Esophageal	
		hypomotility or dilation	
	Serological+3 clinical	PM	
		Muscle weakness	
		Elevated muscle	
		Enzymes	
		Myogenic signs on EMG	
Diagnosis			
4 major criteria and anti-U1 RNP > 4000		At least 1 of the 2 common symptoms + anti-RNP antibodies + at least 1 sign of any 2 of the CTD	Serological + RP + 2/3 other clinical criteria

RP:Raynaud's phenomenon, PM:Polymyosities, CTD:Connective Tissue Disease

## Discussion

Childhood MCTD is a rare clinical condition. Characteristics evolve over time from a more limited presentation to one with overlapping features of JIA, SLE, SSc, or JDM. As a result it poses significant diagnostic challenge. However, the presence of distinct genetic (association with HLA DR4, and HLA-B8) and serological criteria (high titers of anti U1 RNP antibodies in the absence of anti Sm antibodies)<sup>8</sup> are useful in diagnoses of MCTD. So MCTD should be kept as a differential diagnosis when overlapping features of autoimmune diseases are present.

Several diagnostic criteria for MCTD have been evaluated for adults. None of them have been validated for use in children. Table 1 shows the diagnostic criteria for MCTD. These are suggested

for the diagnosis of MCTD in adults.<sup>1,8,9</sup> However, currently there are no standard criteria approved by the American College of Rheumatology (ACR) for adults or children.

In our patient, our primary diagnosis was Systemic lupus erythematosus (SLE). Later on MCTD was evident from the following clinical features malar rash, photosensitive rash, Painless oral ulcer on hard palate, alopecia areata, symmetrical arthritis in both knee joints which show more than 15 min of morning stiffness, ANA positivity in speckled pattern on immunofluorescence staining negative anti-ds DNA, Anti-U1-RNP antibody was positive but anti-Sm antibody was negative. So, this case fulfils the criteria for MCTD.

There is no specific treatment for MCTD. Management is based on the predominant problems

of the child, such as arthritis, cutaneous disease, or visceral involvement. Low-dose glucocorticoids, nonsteroidal anti-inflammatory drugs, hydroxychloroquine, or a combination of these medications are used for the treatment of children. Some advocated the use of cytotoxic drugs such as cyclophosphamide and methotrexate.<sup>9</sup>

The long-term outcomes of MCTD are still unpredictable in children because of the lack of information available. Sharp et al defined MCTD as a relatively benign condition.<sup>1</sup> Some showed in children course of the disease is milder in comparison to adults.<sup>8,9</sup> The most frequent causes of death are development of pulmonary hypertension and interstitial lung disease.<sup>1,8,9-10</sup>

As pulmonary hypertension is less common in children with MCTD they have less morbidity and mortality than adult-onset MCTD. Mier RJ et al showed children have a favorable outcome (82%) and features of SLE and JDM/PM disappear over time and SSc, arthritis, and Raynaud Phenomenon persist, but complete remission was rare.<sup>10</sup> Knight et al reported that depression and anxiety symptoms, including suicidal tendency, were significantly more in pediatric SLE/MCTD patients than in healthy subjects.<sup>11</sup>

### Conclusion

MCTD consists of a number of connective tissue disorders, thus many different outcomes are possible, depending on the organs affected, the degree of inflammation, and disease progression and different pattern of treatment in different patients. However, there is no way of preventing the disease, as the causes of MCTD are not known.

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## ABSTRACT FROM CURRENT LITERATURE

### **Cow's Milk Exposure And Atopic Dermatitis After Six Months Of Age**

Kadek Surya Jayanti, Ketut Dewi Kumara Wati, Putu Gede Karyana

*Paediatr Indones*, Vol. 56, No. 6, November 2016: 325.

**Background** About 60% of individuals with atopic dermatitis(AD) develop their first manifestation during infancy. Cow's milk(CM) exposure is considered to be a risk factor for AD.

**Objective** To evaluate for an association between cow's milk exposure and atopic dermatitis in infants > 6 months of age.

**Methods** This cross-sectional study consisted of subjects from a previous study and new subjects recruited in order to meet the minimum required number of subjects. Our study population comprised 120 infants, born between 1 February and 30 November, 2012 in Sanglah Hospital, Denpasar. Subjects were divided into CM and non-CM groups and analyzed for their risk

of AD. Subjects were included to CM group if they were fed with cow's milk/formula and included to non-CM group if they were breastfed exclusively in the first six months of life. Other possible risk factors were assessed by multivariate analysis.

**Results** One hundred twenty subjects were enrolled and analyzed (59 in the CM and 61 in the non-CM groups). The prevalence of AD was 30%. Multiple logistic regression analysis revealed a significant association between CM exposure and AD, with odds ratio (OR) 2.37 (95%CI 1.036 to 5.420; P=0.04). In addition, maternal diet including eggs and/or cow's milk during the breast feeding period was significantly associated with AD in infants (OR 3.18; 95%CI 1.073 to 9.427; P=0.04).

**Conclusion** Cow's milk exposure is significantly associated with atopic dermatitis in infants > six months of age.

### **Lactate Clearance As A Predictor of Mortality In Neonatal Sepsis**

Felix Nathan Trisnadi, Ekawaty Lutfia Haksari, Tunjung Wibowo

*Paediatr Indones*, Vol. 56, No. 4, July 2016: 193.

**Background** Neonatal sepsis remains the leading cause of neonatal deaths. Therefore, efforts should be made to reduce its mortality. lactate clearance can be used as a marker of onset of hypoxia and microcirculation disorders, as well as to predict patient outcomes.

**Objective** To assess the use of lactate clearance to predict mortality from neonatal sepsis.

**Methods** We conducted a prospective cohort study in the levels 2 and 3 of neonatal care unit, Department of Child Health, Dr.Sardjito General Hospital, Yogyakarta, from October to November 2011. We enrolled 40 neonatal sepsis patients, who were divided into either the high or low lactate clearance groups. All neonates were followed up until they were discharged from the hospital, as to whether they survived or died. We performed blood lactate measurements early on following their diagnosis of sepsis, and after the subsequent six hours following the first antibiotic administration. logistic regression for the multivariate analysis and ROC curves for the accurate analysis of predictive outcome factors were performed.

**Results** more deaths occurred in neonates with low lactate clearance at six hours (48%) than in those in the high lactate clearance group (7%). low lactate clearance at six hours was a significant predictor of mortality (RR 15.1; 95%CI 1.7 to 133), whereas the ROC analysis showed moderate accuracy.

**Conclusion** lactate clearance at six hours may be used as a predictor of mortality in infants with neonatal sepsis.

### Effect of Zinc Supplementation on Early Outcome of Neonatal Sepsis - A Randomized Controlled Trial

Newton B and Bhat BV, Dhas BB, Mondal N, Gopalakrishna SM.

*Indian Journal of Pediatrics 2016;83:289-93.*

**Objective** To find the effect of zinc supplementation on the outcome of neonatal sepsis at one month of age.

**Methods** This randomized controlled trial was conducted in a tertiary care neonatal unit, enrolling neonates with clinical features of sepsis and positive blood culture or positive sepsis

screening tests. The treatment group received 3 mg/kg/twice a day of zinc sulfate monohydrate orally for 10 d along with standard antibiotic therapy. The control group received standard antibiotic treatment without zinc. Samples were collected from both the groups before and after the treatment. Babies were monitored till discharge and followed up as outpatients till one month of age.

**Results** Demographic characteristics were similar between the cases and controls. After 10 d of treatment, the mean serum zinc level between the two groups was  $737.09 \pm 219.97$  vs.  $801.26 \pm 405.56$ , ( $p = 0.20$ ). Outcome measures like days of hospital stay (15 vs. 15;  $p = 0.69$ ) and mortality rate (4.5 % vs. 13.6 %;  $p = 0.27$ ) were not found to be significantly different

between the groups. At one month of age, more number of control neonates had abnormal neurological findings as compared to the zinc supplemented group [ $P = 0.02$ ]; RR (95%CI) = 0.28 (0.11–0.73)].

**Conclusions** Zinc supplementation in neonates with sepsis improves the neurological status at one month of age although the mortality reduction was not statistically significant assessed the neurological outcome of the babies. BVB, SMG and NM reviewed the manuscript.

### Sequential Therapy is Superior to Triple Therapy for Helicobacter pylori Infection in Children: A Meta-Analysis

Yan Huang, Xue Zhan

*Indian Journal of Pediatrics 2016;83:307-315*

**Objectives** To assess the efficacy and safety of 10-d sequential therapy compared to 5 to 14-d triple therapy for treating Helicobacter pylori infections in children according to the eradication rates.

**Methods** The Cochrane Library, MEDLINE, EMBASE, China National Knowledge Infrastructure databases, and other sources were searched in November 2014 without language restrictions. Randomized controlled trials (RCTs) that compared sequential therapy with triple therapy for H. pylori eradication in children were included. Dichotomous data were pooled to obtain the relative risk (RR) of the eradication rate with a 95 % confidence interval (CI).

**Results** Fourteen RCTs with 1698 participants (718 and 980 for sequential and triple therapy, respectively) were included. The intention-to-treat eradication rates were 73 % (95 % CI: 70-76) and 66 % (95 % CI: 64-70) for sequential and triple therapy respectively. The pooled RR was 1.16 (95 % CI: 1.09-1.23), resulting in a number needed to treat of 16 (95 % CI: 10-48), favoring sequential therapy. Sequential therapy was superior to 7- and 10-d triple therapy. Sequential and triple therapy did not differ significantly in the overall risk of adverse effects.

**Conclusions** In children, sequential therapy appears to be superior to triple therapy for H. pylori eradication, although the eradication rates remain lower than the expected goal with both treatments. Factors-associated with a higher risk of eradication failure, such as compliance and antimicrobial resistance, remain insufficiently investigated. Therefore, further high-quality RCTs are needed to compare these different eradication treatment approaches.

# DSH NEWS



*National Professor Shahla Khatun, Honourable Chairperson of the management board of Dhaka Shishu (Children) Hospital receiving a crest on the occasion of Birthday of Bangabandhu Sheikh Mujibur Rahman and National Children's Day 17 March 2017.*



*Vitamin 'A' Plus Campaign, 05 Aug'2017 at Dhaka Shishu (Children) Hospital campus inaugurated by Mohammed Nasim MP, Honourable Minister, Ministry of Health & Family Welfare.*

## **BICH NEWS**

BICH is the academic wing of Dhaka Shishu Hospital. It was established in 30<sup>th</sup> January, 1983. It is affiliated with Dhaka University, Bangabandhu Sheikh Mujib Medical University (BSMMU) and Bangladesh College of Physicians and Surgeons (BCPS). It has been conducting different courses e.g. DCH, FCPS, MD Paediatrics, MS Paediatric surgery & B.Sc in Health technology. It also conducts different sub-specialty courses e.g. FCPS Neonatology, FCPS Haemato-oncology, FCPS Nephrology, MD Neonatology, MD Haemato-oncology and MD Nephrology. It conducts 3 months certificate course in Paediatrics and 15 days Intensive course for MCPS. It organizes IMCI training and Palli Shishu Rural Health Training. Apart from this, the Institute also runs its regular academic activities. It has established Basic Science Department since 2006.

Diploma course of paediatric nursing has been started from 1st January 2012 and Diploma in paediatric physiotherapy under process.

### **Library facilities**

The library of BICH has a rich collection of updated medical texts and reference books and reputed Medical Journals of home and abroad. BICH has introduced Broad Band facilities which are open to all students, teachers/ consultants of hospital for 24 hours. Facilities of library are also improved by HINARI. Students can download 2230 Medical Journals & more than 50 Paediatric Journals.

### **Present News**

A newly formed classroom in BICH has been named as Prof. Sultan Ahmed Chowdhury as a tribute to First Honorary Director of Dhaka Shishu Hospital.

## Postgraduate courses/training in paediatrics and child health

1. FCPS in pediatrics : Twice in a year, in the months of January and July.
2. Recognized center by BCPS for training in Pediatric surgery.
3. Recognized centre for course and training in different subspeciality as: Neonatology, Pediatric Nephrology, Pediatric Haematology and Oncology, Pediatric Pulmonology and Pediatric Neuroscience.
3. MD/MS in paediatrics : Part I: In the month of January every year; 2nd and 3rd parts twice every year.
4. DCH course : Once in a year in the month of July.
5. Three months certificate course : The institute every year runs 3 months certificate course on paediatrics for general practitioners & other post graduate candidates e.g. MCPS.  
(1st August - 31st October)
6. Training programme on IMCI (Integrated management of childhood illness), Essential Newborn Care for doctors and nurses, KMC (Kangaroo Mother Care) traing, ETAT (Emmergency Triage, Assessment and Treatment) training.

**Contact Person** : Prof. Md. Jahangir Alam  
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# Students Qualified from Bangladesh Institute of Child Health

## Undergoing Courses of BICH

Institution	Courses
Bangabandhu Sheikh Mujib Medical University	MD (Paediatrics) MD Paediatric s Nephrology (sub-specialty) MD Neonatology (sub-specialty) DCH MS (Paediatrics Surgery)
Bangladesh College of Physicians and Surgeons (BCPS)	FCPS Part II (Paediatrics)_ FCPS Neonatology FCPS Paediatric Nephrology FCPS Hematology & Oncology FCPS Paediatric Surgery FCPS Paediatric Neurology & Development FCPS Paediatric Pulmonology
Dhaka University	B.Sc in Health technology (Lab)
Bangladesh Nursing Council	Diploma in Paediatric Nursing

## Student Qualified from BICH till June 2017

Course	Number
DCH	340
MD (Paediatrics)	110
MS (Paediatrics)	103
FCPS (Paediatrics)	28
MD (Neonatology)	13
MD (Paediatrics Nephrology)	5
<b>Total</b>	<b>599</b>

## Foreign Student Qualified from BICH till January 2013

Country of origin	Course	Number
Nepal	DCH	23
	MS (Paed Surgery)	2
	MD (Paed)	1
India	MD ( Paed)	1
Iran	DCH	1
Iraq	DCH	1
Somalia	DCH	1
Sudan	DCH	1
<b>Total</b>		<b>31</b>

## Present Students July 2017 December 2017

Name of Courses	Number of Students
DCH	13
MD (Paediatrics)	Phase-A 14
MD (Neonate)	Phase-A 3
MD (Paediatrics Nephrology)	Phase-A 2
MS (Paediatric Surgery)	Phase-A 10
FCPS (Paediatrics)	Part-II 2
MS (Paediatric)	Part-III 2
FCPS (Paediatrics)	Part-II 6
<b>Total</b>	

## **Seminar/Symposium & CME/CPD programs held at BICH (January - June 2017)**

<b>Sl. No.</b>	<b>Topic</b>	<b>Medical Unit</b>	<b>Date</b>
1	Use and misuse of oxygen in children	(MU- I)	11.02.2017
2	Rheumatic fever - An update	(MU-I)	19.02.2017
3	Management on hypertension in kidney disease	(MU-II)	02.04.2017
4	Disorder of sexual development	(SU-III)	21,04.2017
5	Stroke in children	(MU-III)	21.05.2017

## INSTRUCTIONS FOR AUTHORS

Dhaka Shishu Hospital Journal is the official organ of BICH which is the academic wing of DSH. It is published twice a year since 1984. The present editorial board has decided that the cover design will be in accordance with the subject of editorial in each issue. The editor welcome articles to be published in the journal as leading article, original article, review article, case report, current issues of child health, short report and junior's page where trainee doctors are encouraged to publish their topic of interest.

Original papers written in *english* will be considered for publication provided these have not been published previously and are not under consideration for publication elsewhere.

### Conditions for manuscript submission:

- All manuscripts will be subjected to peer and editorial review.
- Accepted manuscripts become the property of the *Dhaka Shishu Hospital Journal*. Any reproduction in whole or part will require written permission from the editorial board of the journal.
- The author should obtain written permission from appropriate authority if the manuscript contains any table; data or illustration from previously published in other journals. The letter of permission should be submitted with the manuscript.
- If the photographs are not disguised, permission from the patient or parents/guardians to print should accompany the manuscript. Otherwise identity will be blackened out.
- Rejected manuscripts/electronic copies/illustrations/photographs will not be returned to the authors.
- Editors are not responsible for courier/postal failure.

**Manuscript preparation:** The format of the Dhaka Shishu Hospital Journal complies with "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" published by the International

Committee of Medical Journal Editors in Vancouver, British Columbia in 1979 (the widely accepted "**Vancouver style**") published in the Annals of Internal Medicine 1982; 96: 766-71. All scientific units should be expressed in *System International (SI) units*. Authors are referred to Annals of Internal Medicine 1987; 106: 114-29 for guidance in the use of SI units. All drugs should be mentioned in their generic form.

- Should be typed in english and on one side of A4 (290 x 210cm) size white paper, using *Times New Roman* font size 12, with single space.
- There should be one original and two paper copies and one IBM compatible electronic copy. (CD or Pen drive)
- There should be a margin of 2.5 cm at top and bottom, and 1.2 cm left and right.
- Pages should be numbered in english numerical at the upper right hand, consecutively, beginning with the title page.
- Manuscripts should be submitted in the following order:
  - ◆ Title : should not exceed 100 characters (Font size 16, bold)
  - ◆ Name of authors, e.g. 1. Prof. Saiful Islam FCPS, FRCP, 2. Dr. Nurun Nahar MD, these two author's name will be written like this; S Islam<sup>1</sup>, N Nahar<sup>2</sup>, etc. (Font size 12) Author's designation and name of place of study will be written after the end of the abstract. (Font size 10).
  - ◆ **Abstract with a specific format with five sections (about 350 words maximum): Background, Objective, Methodology, Results, Conclusion, address of correspondence. All these sections will be Times New Roman, Font size 12 and italic, bold but text will not be bold. No references are allowed in the abstract.**

- ◆ Text (Introduction, Materials & Methods, Results, Discussion, Conclusion).
  - ◆ Acknowledgements
  - ◆ References
  - ◆ Photographs:
    - In CD/ Pen drive
    - With appropriate labeling (number in English numerical, title of photographs and title of manuscripts.) It should be placed in appropriate place of the article.
  - ◆ Illustrations:
    - All illustrations should be cited in the text
    - Illustration should be numbered in English numerical and labeled properly, placed appropriately in relation to text of manuscript.
  - ◆ Tables:
    - Should be appropriately titled.
    - Numbered with Roman numerical serially in order of text description.
    - Abbreviations if used, should be explained in footnotes.
    - Same table should not be repeated as chart.
  - ◆ Figures:
    - Should be appropriately titled and title will be placed below the figure.
    - Numbered with English numerical serially in order of text description.
  - ◆ Placement:
    - All photographs, illustrations, tables and figures should be placed in the text in their appropriate places where their description are given.
  - ◆ References:
    - *References from journal* should be indicated by superscript numbers consecutively in the text and placed after full stop (e.g. ....has been reported.<sup>1</sup> or as shown by Akbar<sup>2</sup> ..... ) in the order in which they are first mentioned and should be listed in numerical order on a separate sheet at the end of the article.
    - References cited only in tables or legends or illustrations should be numbered in accordance with a sequence established by the first mention in the text.
    - Titles of journals should be abbreviated according to Index Medicus or given in full.
    - References must include: (i) all authors, surnames and initials (if there are 6 authors or fewer) or if there are more than 6 authors, the first six authors followed by et al; (ii) the full title of the paper; (iii) the abbreviated or full title of the journal in italic; (iv) the year of publication; (v) the volume no will be bold; (vi) the first and last page numbers followed by full stop. *Example:* Khan NZ. A study of mentally handicapped children: aetiology and associated factors. *Bangladesh Journal of Child Health* 1985; **9**(2):102-08.
    - *References from books* must include: (i) authors name, (ii) title of article, (iii) editors name/s, (iv) name of the chapter, (v) place of publication, (vi) name of publisher, (vii) year of publication and page numbers. *Example:* Razvani I. An approach to inborn errors of metabolism. In: Behrman RE, Kliegman RM, Jenson HB, editors. *Nelson Textbook of Paediatrics*. Philadelphia: Saunders, 2004: p.397-98.
    - *Documents in electronic format* must include: (i) title, (ii) authors name, (iii) year of publication, (iv) web site address, (v) date of access. *Example:* United Nations Programme on HIV/AIDS. Children living in a world with AIDS. Geneva, 1978 (<http://www.....>), accessed on (dd/mm/year).
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