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EDITORIAL

BREATHING EXERCISE IN COVID-19 PANDEMIC

Professor Dr. Khan Golam Mostafa

COVID-19 pandemic is continuously changing the world. In spite of worldwide vaccination, we still do not know how long it will persist. Most people infected with the virus will experience mild to moderate respiratory illness and recover without requiring special treatment. When an individual knows that he or she is COVID-19 positive, he or she becomes very much anxious and stressful. Older people and those with underlying medical conditions like cardiovascular disease, diabetes, chronic respiratory disease, or cancer are more likely to develop serious illness. Anyone can get sick with COVID-19 and become seriously ill or die at any age. So, we do not know whether we are going to be seriously ill with COVID-19 or not. Therefore, we should concentrate on improving our respiratory system.

Breathing exercises have been widely used worldwide as a non-pharmacological therapy to treat people with asthma. Breathing exercises aim to control the symptoms of asthma and COPD. Actually we are increasing the lung compliance by doing breathing exercise. The training of breathing usually focuses on tidal and minute volume and encourages relaxation. Breathing exercises get oxygen deep into the lungs, which helps to clear out mucus and other fluids. During recovery, breathing exercises work to strengthen the diaphragm. Deep breathing exercises also help feel calm, which may be beneficial for coping with long-term illness and recovery [1].

The practice of breathing exercise influences many physiological variables. Evidence suggests that its practice produces a positive impact on the cardiorespiratory system [2], where slow-paced breathing leads to reduced heart rate and decreased systolic and diastolic blood pressure [3], while fast breathing leads to less robust, but consistent increase in heart rate [4]. In fact, a previous study observed that the practice of the breathing exercise with low respiratory rate decreased significantly both the systolic and diastolic blood pressure, with a modest decrease in heart rate [5]. Furthermore, changes in heart rate variability (HRV) also support the notion that the practice of breathing exercise improves respiratory function and cardiac sympathovagal balance, which are important psycho-physiological stress-related variables [6].

It has been hypothesized that the psychobiological mechanism through which breathing exercise exerts its effects are mediated by the vagus nerve, through interconnections between peripheral sensory organs, the solitary nucleus, thalamus, limbic areas, and the prefrontal cortex [8]. Furthermore, it has been suggested that the increase of parasympathetic activity (associated with expiration time) reduces the release of hormones associated with stress [9], and enhances GABA inhibition from the prefrontal cortex and insula to the amygdala, reducing its activity, and the psychological and somatic symptoms associated with stress [8].

Therefore all of us should turn our concentration on increasing our lung compliance by doing regular breathing exercise and try to lead a cheerful healthy life in this new normal world.

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Original Article

Categorization of Male Infertility Patients in a District Level Hospital

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ABSTRACT

Introduction: The aim of this study is to investigate the various causes of male infertility using available approaches (clinical examinations and laboratory tests). **Methods:** One thousand two hundred patients (1200) complaining infertility were analyzed at their first visit with one physician between 1st January 2014 and 31st December 2017. All patients were subjected to physical examination, semen analysis and azoospermic patients underwent hormone tests, transrectal ultrasound (TRUS) and urethrocystoscopy. Semen analysis was based on the definition of World Health Organization (WHO). **Results:** Among the 1200 patients, 732 patients (61%) had semen results in the normal range, 333 patients (27.75%) within the abnormal range and 135 (11.25%) were diagnosed as azoospermia. Varicoceles were diagnosed in 118 of 732(16.12%) normal range patients and in 144 of the 333 (43.24%) abnormal range patients. Of the 135 azoospermic patients 34 patients (25.19%) were diagnosed with obstructive azoospermia, 97 patients (71.85%) with nonobstructive azoospermia and 4 patients (2.96%) with retrograde ejaculation. **Conclusion:** Research must be conducted on a large number of patients with various methods of modern investigations, including testicular biopsy and genetic tests to accurately assess the causes of infertility and formulate newer techniques of treatment.

Key word: Male infertility

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INTRODUCTION

World Health Organization (WHO) defines Infertility as the inability to conceive a child after one year of regular, unprotected intercourse. It currently affects approximately 15% of all couples, 50% of them can be attributed to male factors [1]. The defects causing male infertility can be classified as related to hypothalamus, pituitary gland, the testicles or defective sperm delivery due to defects in the penis or related sex glands [2]. Azoospermia and abnormal semen parameters, such as oligospermia are often observed in infertile men, azoospermia can be classified as obstructive azoospermia (OA) or nonobstructive azoospermia (NOA). The causes of OA can be further divided into congenital and acquired closure of ejaculatory duct, which can occur anywhere along the vas deferens and epididymis. The most common cause of OA is

vasectomy [3]. Other causes are infection, iatrogenic injury during inguinoscrotal surgery and congenital bilateral absence of the vas deferens (CBAVD) [4]. NOA is caused by disorders related to sperm formation in the testicles and can be classified into hypospermatogenesis (HP), maturation arrest (MA) and Sertoli cell only syndrome (SCO).

METHODS

The study was a retrospective study using data from medical records. This study included a total of 1200 infertile male who visited a private clinic in Jhinaidah, Bangladesh between 1st January 2014 and December 31st 2017 and was cared by a single physician. After an evaluation of the subjects' medical history and physical examination; semen was also analyzed. Hand held Doppler machine was used to diagnose varicoceles and Prader Orchidometer was used to measure the testicular volume [5]. After 3 days of abstinence semen analysis was performed within half an hour of collection. Based on the WHO definition the semen was classified into 3 categories: normal range, abnormal range and azoospermia. Patients diagnosed with azoospermia then underwent serum hormone tests including testosterone, follicle stimulating hormone (FSH), and luteinizing hormone (LH). OA was diagnosed with TRUS and urethrocystoscopy and NOA was diagnosed with a higher level of FSH, more than 7 mIU/ml (normal range 2-7 mIU/ml).

RESULTS

The average age of the patients was 25- 46 (35.3 ± 8.7) years. Among the 1200 patients who visited the hospital for male infertility between 1st January 2015 and 31st December 2018; semen analysis revealed 732 patients (61%) with the normal range, 333 patients (27.75%) with the abnormal range and 135 (11.25%) with azoospermia. Varicoceles were diagnosed in 118 out of 732 (16.12%) normal range patients and 144 out of 333 (43.24%) abnormal range patients (Table 1). Among the 135 patients who were diagnosed with azoospermia 34 (25.19%) patients were diagnosed with OA, 97 (71.85%) patients were diagnosed with NOA and 4(2.96%) were diagnosed with retrograde ejaculation. Among 34 OA patients 20 patients had obstruction of vas deferens or epididymis, 11 showed CBAVD and 3 patients were diagnosed with obstruction of ejaculatory ducts.

Table 1: Varicoceles in infertile men

Semen analysis	Varicocele (%)
Normal range	118/ 732 (16.12%)
Abnormal range	144/ 333(43.24%)
Total	262/1065 (24.60%)

DISCUSSION

Disorders of the endocrine system, disturbances in ejaculation, bacterial or viral infections, immunologic factors, varicoceles, undescended testes and anabolic steroids may cause male infertility. However, a clear etiology cannot be determined for many cases of male infertility. Excluding patients who have previously had a vasectomy, nearly 10%- 15% of men had azoospermia [6]. In this study 61% had a normal range of semen parameters, 27.75% had an abnormal range of semen parameter and 11.25% had azoospermia. Forty percent (40%) of azoospermic cases are caused by post testicular obstruction, surgical treatment such as vasovasostomy or vasoepididymostomy should be considered for OA (7, 8, 9 &10). Intracytoplasmic sperm injection (ICSI) is a procedure that uses micromanipulation, which is commonly used during in vitro fertilization (IVF). ICSI requires only one living sperm to achieve fertilization of one egg used in oligospermia, asthenozoospermia (sperm with less motility), teratozoospermia (sperm with abnormal morphology), NOA and in many cases (11, 12, 13 & 14). As treatment of azoospermia differs according to etiology, male patients with azoospermia should receive treatment based on accurate diagnosis and classification. This should lead to a high pregnancy success rate. According to previously reported data 31% of azoospermia is caused by obstructive factors, 54% is caused by non-obstructive factors generated by disorders in

testicular function; and remaining 15% appear normal without evidence of obstruction [15]. In this study, among 135 azoospermic patients 34 (25.19%) patients were diagnosed as OA, 97 (71.85%) were NOA and the remaining 4 (2.96%) patients were diagnosed as retrograde ejaculation. CBAVD or OA which cannot be treated surgically successful treatment can be achieved through MESA (Microsurgical epididymal sperm aspiration) and ICSI or TESE (Testicular sperm extraction) and ICSI (16, 17). Most patients with NOA can be treated with TESE and ICSI and hormonal manipulation. Varicocele is one of the most common causes of male factor infertility occurring in nearly 15% of male adults, also found in 30% to 35% of primary infertility and 69% to 81% of secondary infertility (18, 19). Similar results about varicocele patients were found in our study. All patients with varicocele can be treated with open or laparoscopic varicocelectomy. Abnormal semen parameters, testicular size and histological changes are caused by varicoceles depending on length of the disease (19, 20, 21, 22). A previously carried out study reported that 42.2% infertile male showed varicocele (23). Varicocele is diagnosed in 262 out of 1065 (24.6%) in our study, showed very little difference with previous study.

CONCLUSION

There are various causes and diverse methods of treatment of male infertility. In this regard research must be conducted on a large number of patients to accurately assess the various causes of male infertility in Bangladeshi patients and to adopt various modern infertility treatment methods.

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Original Article

Rationale of Medical Management in Primary Labial Adhesion

Kaniz Fatema[1], Sankar Prosad Biswas[2], Ehesen Ara[3], Afroza Akhter[4], Farhana Hossain[5], Mst. Rahima Khatun[6], Kamrunnahar Sheuli[7], Pushpanjali Roy[8], Nasrin Nahar[9], Tamanna Mohiuddin[10]

Abstract

Introduction: Fusion of the labia minora or majora is called labial adhesion. The exact cause for labial adhesions remains unknown. However, it is believed that a state of low estrogen may be a contributing cause in pre-pubertal girls. Therefore, these patients are typically managed with estrogen cream. However surgical separation is a common practice. This study was carried out to see whether surgical intervention is necessary or not in all cases in the treatment of primary labial adhesion. **Material and methods:** This prospective observational study was carried out between the periods of March 2020 to May 2021 in out-patient private chamber of the author whose guardians came with their children with primary labial adhesion. 30 patients were treated with topical estrogen cream and 5 patients among them were sent for surgical intervention who did not respond to medical treatment. **Results:** 25 patients who completed the medical management were fully cured after 8 weeks of treatment and 5 of them did not respond who were sent for surgical treatment. **Conclusion:** It can be concluded that medical treatment with topical estrogen is an effective treatment for primary labial adhesion.

Key words: Primary labial adhesion

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INTRODUCTION

Labial adhesion is the fusion of the labia minora or majora, and it is mostly located near the clitoris. It also may be known as synechia vulvae or labial agglutination. The exact cause for labial adhesions remains unknown. However, it is believed that a state of low estrogen may be a contributing cause [1].

Therefore, these patients are typically managed with estrogen cream when symptomatic. The incidence is reported to be around 1.8% and the diagnosis occurs most frequently between 13 and 23 months of age [2]. Primary labial adhesion is mostly an incidental finding as the majority of the patients have no symptoms. Mostly the anxious parents come to the physician with their child to exclude whether there is a problem. It is rare in the reproductive

age group due to the sufficient levels of estrogen found in this population. So, it is believed that primary labial adhesion occurs due to estrogen deficiency [3].

For those who do develop labial adhesions during the reproductive age, there is usually a history of some sort of genital trauma like childbirth, sexual abuse, and genitourinary surgery [4] or irritation to the genitalia. Management for these patients tends to consist of lysis of the adhesion as well as applying topical estrogen cream. Post-partum labial adhesion is also reported. It is believed that a possibility may be due to breastfeeding along with the irritation and trauma that occurs during vaginal delivery [5].

Management remains the same. For preventive measures, it is recommended for minimization of vulval irritation accompanied by adequate hygiene to the perineal area. Another recommendation may be for the resumption of sexual activity [6].

Labial adhesion may affect up to 2% of pre-pubertal girls, with the typical age of presentation for labial adhesions at two years of age [7]. In our country the exact data for primary labial adhesion is not available so far. But the frequency of this disease assumes the same incidence. The study by McCann et al. [8], in which an incidence of 38.9% was found in pre-pubertal, asymptomatic girls, represents an exception.

Regarding the pathophysiology, the condition is believed to be due to inflammation of the labia in a low-estrogen environment. It is thought to occur in a hypoestrogenic state due to it being very uncommon in the newborn period when there is maternal estrogen influence as well as during the reproductive period when there are adequate estrogen levels. The inflammation can be due to infection as well as to poor hygiene, including stool contamination. Superficial vulvovaginitis due to dryness of skin due to low estrogen level may be an additive cause [9]. Superficial dermatitis may be aggravated by different causes such as a bacterial infection, a threadworm infection or atopical dermatitis. An unfavourable defaecation or micturition position may also represent a triggering cause [10].

Patients usually have no clinical manifestations, and labial fusion is found incidentally on routine examination. A common location for the fusion of the labia is near the clitoris. The labial adhesion consists of thin fibrotic tissue, which can range from being a small partial fusion to a complete fusion occluding the vaginal orifice. The diagnosis is made on the basis of a clinical examination. Typically an extremely thin, translucent membrane that closes the introitus is observed (Fig 1).

Figure 1: Pirmary labial adhesion

When clinical manifestations do occur, they usually consist of post-void dripping, hematuria, dysuria, and local inflammation in the labial area. These females may come in complaining of difficulty voiding and retention of urine. Urinary tract infections (UTIs) also may be associated with this condition, thus prompting treatment. Some studies have shown that a prepubertal female who has labial adhesion has a higher risk of having a urinary tract infection [11].

If the patient is clinically asymptomatic, there is no need for treatment but reassurance. It is

reported that up to 80% resolve without any treatment [12].When treatment is indicated, it consists of applying estrogen cream to the labial area. Treatment of UTI with proper antibiotic is done if needed. Some studies have demonstrated a success rate of up to 90% with the use of topical estrogen cream. Another common topical management is a topical steroid, such as beclomethasone. Though topical estrogen is the most commonly used, studies have not shown a statistically significant difference between topical estrogen and beclomethasone. There is not a precise length of treatment currently recommended for any form of topical treatment; therefore, the shortest duration that resolves the adhesion is recommended. Topical treatment is usually done so once or twice a day for up to six weeks. Some authors have recommended topical management for up to three months. When topical management fails, then adhesion may be managed surgically.

In our study we have given our patients topical estrogen twice daily for six weeks. The patients are asked to come back in 2 weeks and most of the cases were cured. 2 of our patients were partially cured and they were advised to continue the treatment and they were cured in 3 weeks. In spite of that they were advised to continue treatment for 6 weeks. Among the 30 patients 5 of them were at the age range of 3-6 years and they did not responded to medical management after 2 months. We gave medical management for 1 month more and 3 of the 5 patients responded but 2 patients failed to respond and we sent the 2 patients for surgical intervention.

Recurrences are common in labial adhesions, regardless of the mode of treatment used. Labial adhesions may keep reforming until the female patient goes through puberty. Some studies report a rate of recurrence from 11% to 14% with either topical or surgical management. Recurrences may be managed with topical treatment or with surgical lysis of the fusion. Another treatment modality includes manual separation with a continuation of proper hygiene and cleanliness.

MATERIALS AND METHODS

Our study was a prospective observational study. It was carried out between the periods of March 2020 to May 2021. The guardians of the patients brought them in private chamber with an anxious mind when they observed the fusion between labia majora and minora. After taking history they reported no symptoms. We started treating 32 patients with topical estrogen cream but 2 of them discontinued the treatment or did not came for follow up and we could not trace them. Among the 30 patients 5 of them were at the age range of 3-6 years and they did not responded to medical management after 2 months. We gave medical management for 1 month more and 3 of the 5 patients responded but 2 patients failed to respond and we sent the 2 patients for surgical intervention.

RESULTS

We had most of our patients at 4-6 months (Table 1) of age. We advised for 8 weeks treatment but after follow up majority of our patients were cured in 2 weeks (Table 2). In spite of that we advised them to continue the treatment for up to 8 weeks.

Table 1: Age distribution of the patients

Age In months	Number	Percentage
0-3	2	6.66
4-6	20	66.6
7-12	2	6.66
13-36	1	3.33
37-60	5	16.6
Total	**30**	**100**

Table 2: Duration of treatment at which complete separation occurred.

Duration of treatment	Number	Percentage
Within 2 weeks	15	50
2-4 weeks	7	23.3
4-8 weeks	3	10
>8 weeks	5	16.6
Total	**30**	**100**

Table 3: Therapeutic success of the patients with medical management

Total number of patients	Therapeutic success with medical management	Percentage
30	**25**	**83.33**

DISCUSSION

Primary labial adhesion occurs due to low estrogen environment [1]. The incidence is reported to be around 1.8% and the diagnosis occurs most frequently between 13 and 23 months of age [2]. As it is thought to be due to low estrogen level, recurrence is common until the girl goes through puberty. And in some cases as the baby girl goes older, the success of medial management goes down. So, in that cases manual separation of the labia majora and minora may be required. But after surgical intervention proper hygiene and cleanliness should be maintained.

CONCLUSION

So, from the above study we can conclude that, primary labial adhesion is mostly cured by medical management with topical estrogen and with continuous maintenance of hygiene and cleanliness. In some refractory cases surgical intervention may be needed.

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Original Article

Incidence of Hemorrhage Following Bipolar Tonsillectomy

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Abstract

Objective: To see the incidence of postoperative hemorrhage following tonsillectomy using bipolar electro-cautery device. **Study Design:** Observational type of cross sectional study. Materials and methods: Study carried out from February 2015 to August 2020 in a private clinic of Satkhira, Bangladesh. All tonsillectomy performed during this period was included in the study. Adenotonsilletomy patients were also included in the study but only adenoidectomy patients were not included in the study. Tosillectomies using cold dissection method were also not included in the study. **Result:** The study was conducted on 444 patients, 194 (43.7%) was male and 250 (56.3%) was female. Mean age of study patients was 16.3 ± 15.9 years. Out of 444 patients 14 (3.2%) patients experienced post-operative hemorrhages. None of them had reactionary hemorrhage. All of them had secondary hemorrhage. Mean duration of presentation of post-operative hemorrhage was 8.64 ± 4.09 days. Most of the hemorrhages 12 (85.7%) were controlled by conservative measures. Two (14.2%) patients required hemorrhage control by electro cauterization under general anesthesia. Ten (71.4%) patients were managed in their home with conservative measures advised over telephone. 4 (28.6%) patients required hospital admission for management.**Conclusion:** Post-operative hemorrhage following tonsillectomy is an important issue. Bipolar electrocautery dissection method of tonsillectomy is now widely accepted and widely practiced. Post-operative hemorrhage using this device is in an acceptable range.

Keywords: Tonsillectomy, post-operative hemorrhage, bipolar electrocautery device.

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INTRODUCTION

Tonsillectomy is one of the most common procedures performed by otolaryngologists, accounting for up to 20% of all operations [1]. The first authentic report on the removal of the tonsils was made by Aulus Cornelius Celsus, a roman physician and writer in the first century AD [2].

The traditional technique of cold steel dissection was introduced 100 years ago [3]. Cold steel dissection technique remained for many years as the standard procedure. Since then, multiple surgical techniques and diverse instruments have evolved for this procedure [4]. These various techniques include blunt cold steel dissection, guillotine excision, monopolar diathermy, bipolar diathermy, laser dissection, cryosurgery, bipolar dissection scissors, coblation-assisted tonsillectomy and ultrasonic scalpel tonsillectomy [5-13].

Diathermy techniques were introduced 40 years ago and are also commonly used [3, 14]. In this method, high temperature is generated by the electrocautery device and is used to cut or coagulate tissue. It became popular for less operative time and good intraoperative hemostasis. Each technique has some advantages and disadvantages of its own.

The differences between the various surgical techniques available are described in terms of operative blood loss, operative time, and particularly, postoperative morbidity [15], salient among which is postoperative pain and bleeding. Postoperative hemorrhage still remains the most serious and grave complication of tonsillectomy and its incidence is as high as 10% [16].

Primary post-tonsillectomy hemorrhage is defined as bleeding within the first 24 h after the procedure [17]. Secondary hemorrhage occurs after 24 hours, usually between 5 and 10 days [18]. It is thought to be the consequence of infection of the tonsillar fossae resulting in disruption of vessels and bleeding [19]. Post-operative hemorrhages either reactionary or secondary are troublesome sometimes requiring reentry into operation theater for active management.

The aim of our study was to find out the incidence of post-operative hemorrhage following tonsillectomy using bipolar electrocautery dissection method and to see whether it is a good option or not.

MATERIALS AND METHODS

This study was conducted between the periods of February 2015 to August 2020 in a private clinic of Satkhira, Bangladesh. Convenient non-randomized purposive sampling technique was applied.

All tonsillectomy performed during this period was included in the study. All age and sex group were included. Adenotonsilletomy patients were also included in the study but only adenoidectomy patients were not included. Tosillectomies using cold dissection method were not also included in the study. Patient with past history of quinsy, bleeding disorder, craniofacial abnormality or chronic debilitating disease were also not included in the study.

All study patients were observed in the hospital for 24 hours to see any reactionary hemorrhage and then discharged and advised to report any bleeding afterwards. Those reported over telephone or attended in hospital for any sort of bleeding was noted in OT record book and included in the study as secondary hemorrhage. There were no ethical issues regarding this study.

A total of 444 patients were included during this period as study population. Data was analyzed and graph was generated using Microsoft excel. Continuous variables are analyzed by mean values. The quantitative findings were mentioned by frequencies and percentages.

RESULT

Age and sex distribution of the patients is shown in table 1 which shows, among the 444 patients, 43.7% patients were male and 56.3% patients were female. Male patients were predominating in 0-10 year age group but female patients predominating in other age groups. Out of 444 patients 14 (3.2%) patients experienced post-operative hemorrhages (table 2). None of them had reactionary hemorrhage. All of them had secondary hemorrhage. Male patients 8 (57.1%) were predominating secondary hemorrhage. Maximum hemorrhages 6 (42.9%) occurred in 21-30 year age group.

Figure: Pie chart showing sex distribution of study population.

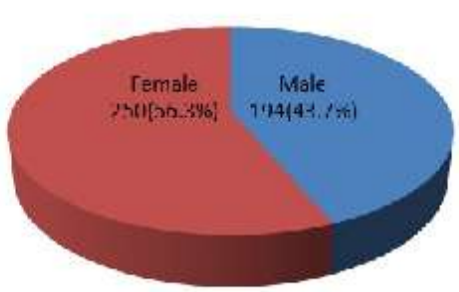

Table 1: Age distribution of the study patients (n=444)

Age Group (Years)	Total n (%)	Male n (%)	Female n (%)	Mean Age
0-10	151 (34)	103 (68.2)	48 (31.8)	16.3 ± 15.9 years
11-20	137 (30.9)	50 (36.5)	87 (63.5)	
21-30	129 (29.1)	34 (26.4)	95 (73.6)	
31-40	24 (5.4)	6 (25)	18 (75)	
>40	3 (0.7)	1 (33.3)	2 (66.7)	
Total	**444 (100)**	**194 (43.7)**	**250 (56.3)**	

Table 2. Age and sex distribution of hemorrhages (n=444)

Age Group (years)	Hemorrhages				Total n (%)
	Reactionary		Secondary		
	Male n (%)	Female n (%)	Male n (%)	Female n (%)	
0-10	0 (0)	0 (0)	2 (66.7)	1 (33.3)	3 (21.4)
11-20	0 (0)	0 (0)	1 (33.3)	2 (66.7)	3 (21.4)
21-30	0 (0)	0 (0)	5 (83.3)	1 (16.7)	6 (42.9)
31-40	0 (0)	0 (0)	0 (0)	2 (100)	2 (14.3)
>40	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	**0 (0)**	**0 (0)**	**8 (57.1)**	**6 (42.9)**	**14 (100)**

Mean duration of presentation of post-operative hemorrhage was 8.64 ± 4.09 days. Most of the hemorrhages 12 (85.7%) were controlled by conservative measures. 2 (14.2%) patients required hemorrhage control by electro cauterization under general anesthesia. 10 (71.4%) patients were managed in their home with conservative measures advised over telephone. 4 (28.6%) patients required hospital admission for management.

DISCUSSION

Tonsillectomy is the most common operation performed by otolaryngologist worldwide. Different methods are used. Of the bipolar electrocautery dissection method is now popular due to low cost and easy availability of the device. Post-operative hemorrhages are the main issues regarding complications. The aim of our study was to find out the incidence of hemorrhage following tonsillectomy using bipolar electrocautery device. The study was conducted in a private hospital in Satkhira for 6 (six) years period. 444 patients undergone bipolar tonsillectomy during the period and all of them were included in the study. Results were analyzed and compared with other studies.

Most of the studies were conducted on paediatric population [20, 21]. In our study all age group were included. Mean age of our study population was 16.3 ± 15.9 years.

Alamgir et al. found (168) 31.11% patients were in 0-10 years age group, (145) 25.9% in 21-30 years age group, (132) 24.4% in 31-40 years age group and (74) 13.7% in 11-20 years age group [22]. In our study we found (151) 34.0% in 0-10 years age group, (137) 30.9% in 11-20 years age group, (129) 29.1% in 21-30 years age group and (24) 5.4% in 31-40 years age group which is more or less similar with the study with little variation in 11-20 years age group.

Alamgir et al. also found male predominance with 360 (67%) male and 180 (33%) female [22]. In our study there is female predominance with (250)56.3% female and 194(43.7%) male. Post-operative hemorrhage in pediatric population is more dangerous due to their small blood volume.

Most studies therefore centered around pediatric group [22]. In our study 151 (34.0%) patients were in 0-10 years age group. Of them 3 patients had hemorrhages which were 21.4% of total hemorrhages. Most of the hemorrhages 6 (42.9%) occurred in 21-30 years age group.

Lee et al. found post tonsillectomy hemorrhage by bipolar electrocautery dissection in 2.5% patients [23]. In another study T. Chimona et al. found post tonsillectomy hemorrhage was in 2.23% patients [24]. In our study 14 (3.5%) patients had secondary hemorrhage which is similar to those studies. VV Raut et al. found overall reactionary hemorrhage in 2 (4%) cases while secondary hemorrhage in 7 (14%) patients which is relatively higher than our study [25]. In other studies the incidence varied ranging from 7-9 % which is higher than our study [26, 27]. In another study the incidence was much higher with a bleeding rate of 18% after discharge [28].

Alamgir et al. found 2 (37%) patients had secondary hemorrhage but there was no reactionary hemorrhage [22]. In our study there was no reactionary hemorrhage which is similar to the study.

Most of the studies considered intraoperative bleeding, operation time, postoperative pain and hemorrhages in their studies. But in our study we considered only post-operative hemorrhage as sometimes it become very much troublesome and occasional life threatening.

CONCLUSION

Post-operative hemorrhage following tonsillectomy is an important issue. Bipolar electrocautery dissection method of tonsillectomy is now widely accepted and widely practiced. Post-operative hemorrhage using this device is in an acceptable range. We recommend using this device as it is easily available and cost effective.

DECLARATION OF INTEREST

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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Original Article

Clinical Profile, Presentation and Treatment of Neonatal Jaundice in an Academic Hospital of Bangladesh

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ABSTRACT

Background: Neonatal jaundice is common presentation in pediatrics practice. However, many associated and contributory factors are associated with this condition. Therefore, the ultimate aim of this research is to depict the profile, presentation, causes and treatment options in our clinical setup. **Aims & objective:** The aims of this research study were to find out the associated causes, clinical features and other associations of neonatal jaundice. **Methodology:** This prospective research was conducted in Khulna Medical College Hospital, Khulna, Bangladesh with a total number of 72 neonates with jaundice. The duration this study was from April 2019 to July 2021. Convenient purposive sampling was the sampling method. **Results:** 62.5 % (45 out of 72 neonates) cases in this research were male and 58.3% was preterm neonates. Physiological jaundice was the commonest type of jaundice in neonates (47.2%). Infection was another important predisposing factor (27.8%). The incidence rates of ABO and Rh incompatibility were 9.7% (07) and 2.7% (02) respectively. Though a small proportion of neonates (6.9%) associated with vague symptoms, most of the neonates was presented with reluctant to feed (39.2%) and infections (19.6%). Fever, vomiting and pallor were next commonest presentation (11.2%). Respiratory distress, mucous diarrhea were common symptoms. Hepatomegaly and splenomegaly were observed in 6.9% (05) and 1.4% (01) cases respectively. Physiological jaundice phototherapy was effective in 100% cases of physiological jaundice. In infection, phototherapy was given in 75% cases with good result. Exchange transfusion was given in ABO (28.6%) and Rh incompatibility (100%). **Conclusion:** Most often neonatal jaundice associated with male sex with preterm cases. Leading pattern is physiological jaundice where phototherapy is quite effective option. ABO and Rh incompatibility usually requires exchange transfusion.

KEYWORDS: Neonatal jaundice

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INTRODUCTION

One of the common causes of pediatric morbidity and mortality is neonatal jaundice in our clinical practice. Moreover, this is a leading cause of newborn hospital admission. Most often the pattern is physiological jaundice [1, 2]. The risk factors of neonatal jaundice in Bangladesh have not been studied enough so far statistically. In a clinical research in BIRDEM Hospital, Dhaka, Bangladesh in 2010, it has been observed that that a substantial number of neonatal jaundice had the history of lower gestational age in Bangladeshi newborns; and the lower gestational age is significantly associated with septicemia and possibly with hyperbilirubinemia. Different clinical aspects of neonatal jaundice have been depicted in this research [3]. From the Child Health Outpatient Department of the Korle-Bu Teaching Hospital, Ghana, no day passes without a baby coming in with neonatal jaundice [6]. In a retrospective study conducted by Onyearugha et al. [4, 5] in Nigeria, 35% of neonates managed at a neonatal intensive care unit during a 24-month period were result of jaundice.

Neonatal jaundice is estimated to occur in 60% of term newborns in the first week of life [6], and < 2% reach total serum bilirubin (TSB) levels of 20 mg/ dL [7]. In rare instances, the TSB reaches levels that can cause kernicterus, a condition characterized by bilirubin staining of neurons and neuronal necrosis involving primarily the basal ganglia of the brain and manifested in athetoid cerebral palsy, hearing loss, dental dysplasia, and paralysis of upward gaze [3]. Risk factors recognized to be associated with severe hyperbilirubinemia in newborns have jaundice in the first 24 hours of life. Glucose-6-phosphate dehydrogenase (G6PD) deficiency, ABO incompatibility, low birth weight and sepsis are the common causes of neonatal jaundice in Asian and South-east Asian regions, but there is a group of babies whose cause of neonatal jaundice has yet to be found. Genetic factors and unidentified environmental factors may also play a role in the prevalence of neonatal jaundice [8].

In this current research, we are trying to evaluate the associations, causes and pattern, treatment modalities of neonatal jaundice in our clinical context in a tertiary hospital, Bangladesh.

METHODOLOGY

This research was a prospective study in Khulna Medical College Hospital, Khulna, Bangladesh. A total number of 72 cases of neonatal jaundice from a period of April 2019 to July 2021 were included in this research, based on inclusion & exclusion criteria. Convenient purposive sampling was used as a method of selecting study sample. The survey data were usually be analyzed using both analytic as well as descriptive statistics. Informed consent was taken from patient's parents and ethical clearance was taken from the ethical review committee of Khulna Medical College Hospital, Khulna, Bangladesh.

RESULTS

In this study, among the 72 neonates with jaundice, 41.7% (30) was full term and 58.3% (42) was preterm (figure 1). 62.5 % (45) of the study population was male. Approximately 47.2% cases had physiological jaundice, followed by 27.8% had jaundice with severe infections. The other causes of neonatal jaundice are shown in table 1. Other than jaundice, the clinical presentation of the neonates is depicted in table 2. The overall treatment modalities given in study population are represented in table 3.

Figure 1: Birth history of study population

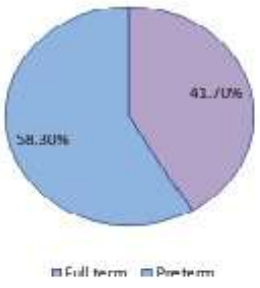

Table 1: Causes of neonatal jaundice

Causes	n (%)
Physiological jaundice	34 (47.2)
Jaundice with infection	20 (27.8)
ABO incompatibility	07 (9.7)
Rh incompatibility	02 (2.7)
Jaundice of pre -maturity	05 (6.9)
ABO and Rh incompatibility	01 (1.4)
Cephal haematoma	03 (4.2)
Total	**72 (100)**

Table 2: Common symptoms and signs (other than jaundice) in study population

Symptoms and sign	n (%)
Non-specific symptoms	05 (6.9)
Reluctance to feed	28 (39.2)
Infection around umbilicus	14 (19.6)
Respiratory distress	06 (8.4)
Mucous diarrhea	05 (6.9)
Fever, vomiting, pallor	08 (11.2)
Pyoderma	03 (4.2)
Hepatomegaly	05 (6.9)
Splenomegaly	01 (1.4)
Convulsion	03 (4.2)
Cephal haematoma	03 (4.2)
Sclerema	01 (1.4)

Table 2: Treatment given in neonates with jaundice

Symptoms and sign	umber	Phototherapy	Exchange therapy	Others
Physiological jaundice	34	34 (100%)	00 (00%)	00 (00%)
Jaundice with infection	20	15 (75%)	01 (05%)	04 (20%)
ABO incompatibility	07	05 (71.4%)	02 (28.6%)	00 (00%)
Rh incompatibility	02	02 (100%)	02 (100%)	00 (00%)
Jaundice of pre-maturity	05	05 (100%)	00 (00%)	05 (100%)
ABO and Rh incompatibility	01	01 (100%)	01 (100%)	00 (00%)
Cephal haematoma	03	03 (100%)	00 (00%)	02 (66.7%)
Total	**72**	**65 (90.3%)**	**06 (8.3%)**	**11 (15.3)**

DISCUSSION

Among the 72 neonates with jaundice, 62.5 % (45 neonates) of the study population were male. The overall incidence was found slightly higher in male neonate in this research. Out of total 72 cases, 41.7% (30) was full term and 58.3% (42) was preterm neonates. Most often, neonatal jaundice was associated with preterm neonates. In many previous researches, it was found that neonatal jaundice may have association with male sex and preterm neonates [5, 6].

Physiological jaundice was found as the most common pattern in this study. The incidence rate was 47.2% (34 neonates). Infection was a common association of neonatal jaundice (27.8%, 20 neonates). In a research, same pattern was observed [3]. The incidence rates of ABO and Rh incompatibility were 9.7% (07) and 2.7% (02) respectively. Other important causes were prematurity and cephal haematoma.

In this research, it was reflected that only a small proportion of neonates (6.9%, 05) presented with vague or non-specific symptoms, whereas most of the neonates was admitted with reluctant to feed and infections (mostly umbilical). The overall incidence rates were 39.2% and 19.6% respectively. Fever, vomiting and pallor were associated with approximately 11.2% (08) neonates with jaundice. Respiratory distress was found in 8.4% (06) cases, whereas 6.9% (05) neonates were associated with loose mucous diarrhoea. Hepatomegaly and splenomegaly were observed in 6.9% (05) and 1.4% (01) cases respectively. Other important symptoms were pyoderma, sclerema, convulsion and cephal haematoma.

Different modalities of measure were taken in course of management. In case of physiological jaundice phototherapy was found as the sufficient treatment with good outcomes (100% cases). In case of infection phototherapy was effective in approximately 75% (15) cases. However, in 05% patient exchange transfusion was required. Exchange transfusion was observed to be necessary in ABO (28.6%) and Rh incompatibility (100%). In case of jaundice of pre-maturity phototherapy was found as effective along with adjuvant therapy.

CONCLUSION

Physiological jaundice is the commonest pattern of neonatal jaundice where phototherapy is most often the sufficient effective treatment. However, in most of the cases with ABO and Rh incompatibility exchange transfusion may be required along with phototherapy. Neonatal jaundice may have intimate association male sex, pre-term neonates and infections.

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Original Article

Outcome of Displaced Pediatric Radial Neck Fracture Managed by Open Reduction and K-Wire Fixation

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ABSTRACT

Background: Pediatric radial neck fracture represents 1% of all children's fracture and 5-10% of elbow fractures. Management of pediatric radial neck fracture remains a challenging and controversial issue. The treatment of radial neck fractures in children varies according to the fracture's displacement, angulation, and skeletal maturity. Open reduction is inevitable in cases of comminuted fractures, interposition of the capsule or annular ligament between the head and the neck, totally displaced, and fracture dislocation. **Objective:** To evaluate the outcome of displaced pediatric radial neck fracture managed by open reduction and fixation by K-wire. **Material & Method:** This was a prospective observational study carried out at National Institute of Traumatology and Orthopedic Rehabilitation (NITOR) Dhaka. 29 patients with radial neck fractures were selected by purposive sampling method according to inclusion and exclusion criteria. All patients were treated with open reduction and K-wire fixation and followed up for 6 months. **Results:** The mean age was 9.96±2.63 years with a slight male predominance (51.7%). Mostly affected hand was left (58.6%). The mean (±SD) duration from injury to surgery of the patients was 5.89(±3.23) days. The main cause of injury was fall on slippery ground (34.5%). In most cases, fracture type was Judet type IVa (65.5%). At last follow up, pronation and supination ≥50 degree found in 72.4% cases. Flexion-extension >1000 was found in 72.4% cases. In 3 patients (10.34%), there was mild pain. In 4 (13.8%) cases, the joint was moderately instable. Radiologically, 20 (69.0%) cases were found excellent at last follow up. After last follow up, 69.0% were excellent, 27.6% were good and 3.4% were found fair according to MEPS. Post-operative complications were found in 10.4% cases. MEPS was found to be strongly associated with injury to operation time, type of radial neck fracture, age of the patients and post-operative complications. **Conclusion:** Open reduction and K-wire fixation is a good and convenient method for treating pediatric radial neck fracture which is displaced, more angulated, reduction not possible by closed technique.

Keywords: Pediatric radial neck fracture, open reduction and fixation by K-wire.

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INTRODUCTION

Radial neck fractures is the third most common fracture of elbow in children after supracondylar and epicondylar fractures [1]. They are predominant among children aged between 8 and 12 years. It includes injuries through the physis (Salter-Harris type I and II lesions) as well as metaphyseal fractures of the radial neck [2]. A basic problem is the vascularization of the radial head through the metaphysis, where most fractures occur which may cause an avascular necrosis of the radial head. The reconstruction of the joint congruity and the regain of a physiological range of motion are often challenging, and an open reduction, which is associated with considerable risks, is still necessary in some cases [1].

About half of the children with radial neck fractures have subsequent limited forearm rotation [3]. Heterotopic ossification around the elbow [4] and radioulnarsynostosis can also limit motion [5]. Deformity may result from avascular necrosis of the radial head [6], nonunion of the fracture, and radial head overgrowth [7]. Physeal injury can lead to partial or complete physeal arrest, which can affect the length and alignment of the radius in the future [4, 7, 8]. The most common deformity that results is cubitus valgus. The PIN can be injured by the fracture, by reduction attempts, or during an open reduction [9].

Open reduction and internal fixation is often used in comminuted fractures or in fractures with a completely displaced head anteriorly or posteriorly on the radial metaphysis, interposition of the capsule or annular ligament between the head and the neck, totally displaced, and fracture dislocation [10]. The goals of this method of treatment include stable articular surface fixation and restoration of articular congruencies and the radial head-neck relationship to facilitate early active motion [11].

Management of pediatric radial neck fracturesare controversial regarding acceptable alignment, variable reduction techniques, and suboptimal outcomes. Closed reduction is technically demanding but frequently unsuccessful in unskilled hands. Operative treatment should be considered when displacement remains over 2 mm, angulation is greater than 450 (age < 10) or greater than 300 (age >10) and for open injuries. The most widely used, technique in the treatment of displaced fractures is percutaneous nail osteosynthesis using Metaizeau technique [12]. However, this technique has some drawbacks: not easy to perform, cannot ensure anatomical or almost anatomical reduction especially in case of severely displaced or angulated fracture.

Open reduction and fixation by K-wire is an easy procedure where intact periosteal hinge helps in reduction. In open reduction the disrupted capsule, collateral and annular ligament can be repaired. So far of my knowledge, no study was carried out in our institute on the management of pediatric radial neck fracture by open reduction and K-wire fixation.

AIMS AND OBJECTIVES

The present study aimed to evaluate the outcome of the treatment of displaced pediatric radial neck fracture by open reduction and fixation by K-wire.

MATERIALS AND METHODS

The study was a prospective observational study, conducted from July 2017 to June 2019, in National Institute of Traumatology and Orthopedic Rehabilitation (NITOR), Sher-E-Bangla Nagar, Dhaka. A total of 29 patients with displaced pediatric radial neck fractures with open growth plates (6-16 years) were purposively included in the study. Patients with open fracture, pathological fracture, fracture with non- union, displacement <2mm were excluded from the study. A semi-structured questionnaire was used to collect data. Clinical motion, radiographic alignment, subsequent procedures, and com plications (heterotopic ossification, osteonecrosis, premature physeal arrest, and neurovascular injury) were recorded. Angulation and displacement were measured on the antero-posterior and lateral radiographs by Goniometer. All fractures were classified according to the method described by Judet classification.

All patients under gone open reduction and K-wire fixation. After 10-14 days stitches were off. After 3 weeks, X-ray was taken to see the neck shaft alignment. Then K- wire and back slab were removed. Arm was supported by oose elbow bag and advised to move the elbow (flexion, extension, pronation, and supi

lnation). At 6th week patients were evaluated according to MEPS. At 3rd month, X-ray was taken to see the radiological alignment and patients were evaluated according to MEPS. At 6th month, again X-ray was taken to see the radiological alignment and patients were evaluated according to MEPS.

The statistical analysis was conducted using SPSS (statistical package for social science) version 25 statistical software. The findings of the study were presented by frequency, percentage in tables and graphs. Means and standard deviations for continuous variables and frequency distributions for categorical variables were used to describe the characteristics of the total sample. Radiologically, the reduction was considered excellent when it healed in the anatomical position, good when the radial neck angle was less than 20º, fair when the angle was between 20º and 40º, poor with an angle of more than 40º. The MEPS ranged from 5 to 100 points, with higher scores indicating better function. If the total score was between 90 and 100 points, it could be considered excellent outcome; between 75 and 89 points was good; between 60 and 74 points was fair and less than 60 points was poor.Associations of data were assessed using Fisher Exact test. Here, $p<0.05$ was considered significant. Here, all p-values were two sided.

At the beginning, approval was obtained from protocol approval committee/thesis committee of National Institute of Traumatology and Orthopedic Rehabilitation (NITOR), Sher-E-Bangla Nagar, Dhaka. Also written permission was taken from the patients.

RESULTS

Among the patients, 68.9% (n=20) were from ≤ 10years age group, 51.7% (n=15) patients were male, 58.6% (n=17) patients had fracture on the left hand, 68.9% (n=20) had duration of injury from 2 to 5 days and 20.6% (n=6) had duration of injury from 6-10 days. Majority of the patients (65.5%, n=19) had Judet type IVa radial neck fracture (Table 1).

At 6th month, majority of the patients (72.4%, n=21) had ≥500 pronation, 21 (72.4%) had ≥ 500 supination. Mild pain was found in 10.3% (n=3) patients, 21 (72.4%) had >1000 range of motion and one fourth of the patients (24.1%, n=7) had 500-1000 range of motion, 25 (86.2%) had stable and one fifth of the patients (13.8%, n=4) had moderate instability. Excellent radiographic alignment was found in 20 (69.0%) patients and 31.0% (n=9) had good radiographic alignment (Table 2).

Majority of the patients (89.6%, n=26) patients had nopost-operative complication. Others had Avascular necrosis(3.4%, n=1), Premature fusion of epiphysis(3.4%, n=1) and Heterotrophic ossification(3.4%, n=1) (Table 3).

The MEPS significantly worsen with longer duration from injury to surgery($p<0.001$), increasing grading of type of radial neck fracture according to Judet classification($p=0.004$), increasing of age of the patients ($p<0.001$), presence of post-operative complication ($p=0.008$) (Table 4).

According to Mayo Elbow Performance Score(MEPS), after 6 months, majority of the patients (69.0%, n=20) had excellent outcome and had 27.6% (n=8) good outcome (Figure 1).

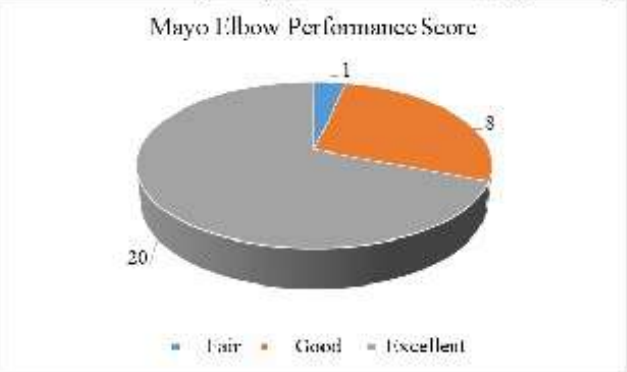

Figure 1: Distribution of the patients by Mayo Elbow Performance Score (MEPS) at 6th month

Discussion

The aim of the present prospective observational study was to evaluate the outcome of the treatment of displaced pediatric radial neck fracture by open reduction and fixation by K-wire. Results of the present study showed that the mean age of the patients was 9.96±2.63 years where minimum age was 6 years and maximum age was 14 years. Majority of the patients (68.9%) were from ≤ 10 years age group and others (31.03%) were from >10

Table 1: Baseline characteristics of the patients (n=29)

Baseline characteristics	Frequency (n)	Percentage (%)
Age (in years)		
≤ 10	20	68.9
>10	9	31.03
Male gender	15	51.7
Female gender	14	48.3
Left side	17	58.6
Right side	12	41.4
Duration (in days)		
2 to 5	20	68.9
6-10	6	20.6
>10	3	10.3
Type of radial neck fracture		
Type III (30^0-60^0 angulation)	3	10.3
Type IVa (60^0-80^0 angulation)	19	65.5
Type IVb (>80^0 angulation)	7	24.1

Table 2: Distribution of patients by clinical characteristics and radiographic alignment at 6th month (n=29)

Characteristics	Frequency (n)	Percentage (%)
Pronation		
<50 degree	8	27.6
≥50 degree	21	72.4
Supination		
<50 degree	8	27.6
≥50 degree	21	72.4
Pain at 6th month		
Mild	3	10.3
Absent	26	89.7
Range of motion (in degree)		
<50	1	3.4
50-100	7	24.1
>100	21	72.4
Stability		
Moderate instability	4	13.8
Stable	25	86.2
Radiographic alignment		
Good	9	31.0
Excellent	20	69.0

Table 3: Distribution of the patientsbypost-operative complication within 6 months (n=29)

Post-operative complication	Frequency (n)	Percentage (%)
Absent	26	89.6
Avascular necrosis	1	3.4
Premature fusion of epiphysis	1	3.4
Heterotrophic ossification	1	3.4

Table 4: Factors affecting theMayo Elbow Performance Score (MEPS) after 6 months (n=29)

	Mayo Elbow Performance Score (MEPS)			p value
	Fair	Good	Excellent	
Duration from injury to surgery				
1-5 days	0 (0)	0 (0)	20 (100)	<0.001[$]
6-10 days	0 (0)	6 (100)	0 (0)	
>10 days	1 (33.3)	2 (66.7)	0 (0)	
Type of radial neck fracture				
Type III	0 (0)	1 (33.3)	2 (66.7)	0.004[$]
Type IVa	0 (0)	2 (10.5)	17 (89.5)	
Type IVb	1 (14.3)	5 (71.4)	1 (14.3)	
Age of the patients				
Up to 10 years	0 (0)	0 (0)	20 (100)	<0.001[$]
>10 years	1 (11.1)	8 (88.9)	0 (0)	
Post operative complications				
Absent	0 (0)	6 (23.1)	20 (76.9)	0.008[$]
Present	1 (33.3)	2 (66.7)	0 (0)	

years age group. In the series of Biradar, et al. [13] the mean age of the cases were 7.7±1.2. Again in the series of Zimmerman, et al. [14] the mean age was 8.4 ± 2.9 years. The ossification center of the proximal radial epiphysis usually appears at age 4 to 5 years. Before this, the radial head is radiolucent and fracture can only diagnosed if accompanied by metaphyseal flake of bone. For this fracture in children less than 5 years are rarely diagnosed [3]. The physis closes at age 16 to 18 years [15]. Patients with open growth plates (6-16 years) were purposively selected for this study.

The mean duration from injury to surgery of the patients was 5.89 ± 3.23 days where minimum duration was 2 days and maximum duration was 13 days. In the series of Tan & Mahadev [16] the time from injury to surgery was 0 to 7 days. In their study, Zimmerman, et al., (2013) found that a time from injury to surgery of two days or less was independent predictors of unsuccessful outcomes. In this study, most of the cases (68.97%, n=20) were operated in between 2 to 5 days. As National Institute of Traumatology and Ortho

pedic Rehabilitation (NITOR) is a tertiary center, receiving referral patients from all over the country, the mean duration of injury was more than other study.

Majority of the patients (65.52%, n=19) had Judet type IVa radial neck fracture whereas others had Judet type IVb (24.14%, n=7) and Judet type III (10.34%, n=3) radial neck fracture. There is a general agreement that displaced radial neck fractures with more than 30º angulations (Judet type III and IV fractures) should be surgically treated [8, 17]. So all the fracture included in this study were either Judet type IV or III. In the series of Ursei, et al. [18] 55% of the cases were Judet Type III and 45% were Judet type IV. This results are quiet similar to the current study.

During normal rotation, the radial head circumscribes an exact circle within the proximal radioulnar joint. Displacement of the radial head on the neck changes the arc of rotation of the head and leads to a loss of supination and pronation [19, 20]. At the end of 6th month, majority of the patients (72.4%, n=21) had ≥ 500 pronation and supination and more than one fourth of the patients (27.6%, n=8) had <500 pronation and supination on the affected hand. The mean pronation & supination was 66.550 ± 17.980 and 70.860 ± 17.530. But in their study, Zimmerman, et al., (2013) showed mean pronation & supination at last follow up was 760 ± 230 and740 ± 270 respectively. There result was slightly increased from the present study because of the extended follow up period of their study (mean follow up was 13.3 months). The arc of pronation & supination is expected to be improved with time and active movement of affected elbow [3].

At the end of 6 month, most of the patients had no pain (89.66%, n=26). 3 (10.34%) cases had mild pain. Among them, one had associated olecranon fracture, one had heterotrophic calcification and the other had avascular necrosis. In the series of Falciglia, et al. [21], 3 out of 28 cases (10.71%) had mild pain at last follow up. This result is similar with the current study. Although Falciglia, et al. [21] elicited pain in another 4 (14.29%) cases after strenuous activity, this presence of elicited pain has not been showed to current study.

Majority of the patients (72.4%) had >1000 range of motion and one fourth of the patients (24.1%, n=7) had 500-1000 range of motion on the affected hand. Only one patient who had had <500 range of motion on the affected hand. In the series of Zimmerman, et al. [14] the mean arc of motion at last follow up was 1320 whereas, the mean arc motion of this study was 105.860. There result was slightly increased from the present study because of the extended follow up period of their study (mean follow up was 13.3 months). The arc of motion is expected to be improved with time and active movement of affected elbow [3].

Majority of the patients (86.21%, n=25) had stable joint at last follow up. Only 4 (13.79%) cases had moderate instability and no cases of gross instability. But in the series of Zimmerman, et al. [14] found instability of radiocapitel lar joint in only 1% cases. As they did not categorized instability, it could not be ascertained whether that 1% cases were moderate or gross instable.

Regarding radiographic alignment at last follow up, majority of the patients (69.0%, n=20) had excellent and 31.0% (n=9) had good result. In the series of Biradar, et al., (2016) 5(33%) had excellent results 6(40%) had good results 2(13.3%) had fair results and 2(3.3%) had poor results. The radiological outcome of current study is much better than the study of Biradar, et al. [13]. Biradar, et al. [13] performed open reduction when closed reduction failed, but in the current study closed reduction has not been tried which may affect the radiological outcome.

According to Mayo Elbow Performance Score (MEPS), majority of the patients (69.0%) had excellent outcome and had 27.6% good outcome. Only one patient had fair outcome. In their series, Klitscher, et al. [22] ended with 82% excellent and 18% good result after open reduction of fractured radial neck which is comparable to current study. Again, Biradaret al. [13] evaluated the outcome of open reduction and temporary internal fixation of pediatric radial neck fractures and reported that 20% patients had excellent result and 26.7% had good outcomes. In their study 53.4% patients had fair to poor outcomes. The dissimilarity of result might be due to the fact that Biradaret al. [13] had conducted the study among the patients in whom initial closed reduction had failed and it is hypothesized that closed reduction maneuver may cause iatrogenic injury to physis which would ultimately affect the outcome [23].

Elbow stiffness is a common sequel of elbow trauma hypothesized to occur for several reasons including highly congruent articular anatomy with three joints encompassed by a single joint capsule that thickens with disorganized collagen fibers, altered cytokine levels, and elevated myofibroblasts after trauma [24]. It has a propensity to form heterotopic ossification around the elbow, particularly in the brachialis muscle [25].

After 6 month follow up, majority of the patients (89.6%, n=26) did not have any complication. Complications include avascular necrosis of radial head (3.45%, n=1), premature fusion of epiphysis (3.45%, n=1) and heterotrophic ossification (3.45%, n=1). In the study of Zimmerman, et al. [14] the overall complication rate was 27%: 20% of the patients had heterotopic ossification, 3% had AVN of radial head, 3% had premature physeal closure, 2% had neurovascular injury, and 1% had residual radiocapitellar instability. The incidence of complication is quiet similar to the current study. Brandão, et al. [13] found 3 (11.2%) cases of complication which included 2 cases of enlargement of radial head and 1 case of heterotrophic ossification. In the series of Fowles and Kassab [3], two patients developed pin tract infection and in two patients pin broke at the joint. But in the present study, pins were introduced through the side of the radial head, cross the fracture and capture the metaphysis to prevent loss of reduction. No patient developed pin tract infection.

Heterotopic ossification is the formation of mature lamellar bone in extra-osseous soft tissues [26]. One patient (3.45%) in this study developed Heterotopic ossification.

The MEPS significantly worsen with longer duration from injury to surgery ($p<0.001$). Tibone and Stoltz [17] also reported that results were poorer in children when treatment was delayed.

The present study found that the MEPS significantly worsen with increasing grading of type of radial neck fracture according to Judet classification. Similar result was shown by Tan & Mahadev [16], where it was found that higher fracture grades Radial neck fractures in children correlated positively with poorer outcomes ($p=0.001$).

Older children tend to sustain more severe fractures and have poorer outcomes. This could be due to the higher energy involved in the injuries in older children. In addition, younger children's bones are more cartilaginous and hence more cushioned. The energy from the trauma is more effectively absorbed, resulting in less severe fractures. The bone also has greater remodeling potential and hence can achieve better outcomes [16]. The current study also found that patients with up to 10 years age had 100.0% excellent outcomes whereas no patient more than 10 years of age had excellent outcomes. Results of the current study found that MEPS significantly worsen with increasing of age of the patients.

Patients with post-operative complication had significantly poorer outcomes [21]. The present study also revealed that the MEPS significantly worsen with presence of post-operative complication.

CONCLUSION

Open reduction and K-wire fixation provides satisfactory outcomes for displaced pediatric radial neck fracture. Increased age of the patients, longer duration from injury to surgery and presence of associated injury are associated with poorer outcome.

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Original Article

Assessment of Vitamin D Status in Asthmatic Patients of Satkhira Chest Disease Clinic

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Abstract

Introduction: Asthma is a chronic inflammatory pulmonary disorder which causes constriction in airway resulting in shortness of breath, chest tightness, cough and wheeze. Asthma can start at any age but most commonly starts in childhood. Sometimes it runs in families but many people with asthma have no family history. Inborn and adaptive immune response is thought to play a significant role in the development of asthma. The discovery of vitamin D receptor (VDR) connected vitamin D to the immune system. Several researches suggested an autoimmune role of vitamin D due to its effects on immune cells such as T lymphocytes, B lymphocytes, and dendritic cells. **Materials & Methods:** This study was conducted in Satkhira Chest Disease Clinic, Satkhira, Bangladesh during from March 2021 to November 2021. For the study purpose 100 cases and 100 controls were selected randomly and Vitamin D was measured in their serum. **Results:** Serum vitamin D level is found low in asthmatic patients than controls. **Conclusion:** Vitamin D plays a significant role in inborn and adaptive immunity and we found low serum vitamin D in asthmatic patients.

Key words: Vitamin D, asthma, immune system, infection

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Introduction

Asthma is a chronic inflammatory pulmonary disorder which causes constriction in airway resulting in shortness of breath, chest tightness, cough and wheeze. It can be mild, moderate and severe. Asthma can start at any age but most commonly starts in childhood. Sometimes it runs in families but many people with asthma have no family history [1]. According to WHO promoted organization GINA (Global Initiation for Asthma) the global burden of asthma is around 300 million people [2]. It is associated with high morbidity and mortality especially in the adult population. As a result, national and global efforts have been implemented to reduce asthma prevalence, mortality and morbidity [3, 4]. There are several unclear factors responsible for the development of asthma because children and adults have different presentation [5].T-helper cell type-2 cytokines like interleukin (IL-4, IL-5 and IL-13) are regulated in the asthmatic airway and are related-

with increased eosinophilia, mast cell degranulation and increased level of immunoglobulin E (IgE) [5, 6]. The complex interaction between cells and inflammatory mediators and impairment of immunogenic tolerance promotes airway injury. This process is known as airway "remodeling" [7]. Airway remodeling causes hypertrophy of smooth muscle, hyperplasia of epithelial goblet cell and deposition of airway extracellular matrix protein due to this air flow obstruction increases and finally creating the pulmonary symptoms [8]. From all vitamin D, serum 25(OH)D is the best indicator which reflects the overall vitamin D status in the body. It accounts the intake of vitamin D from dietary sources as well as sun exposure and adaptation of vitamin D from adipose stores in the liver [10]. Although there are several researches done on the role of vitamin D in asthmatic patients but the clinical theory is still unclear.

Vitamin D is synthesized in the body from sunlight and through the diet. It is a fat-soluble natural nutrient which is a modulator of calcium absorption and bone health. It also plays an important role in immune regulation and in respiratory infections [9, 10].

MATERIALS AND METHODS

This study was conducted in Satkhira Chest Disease Clinic, Satkhira between the periods from March 2020 and November 2020. The patients who come for taking treatment in the out-patient department of Satkhira Chest Disease Clinic were enrolled for the study. For the study purpose 100 cases and 100 controls were selected randomly and their serum vitamin D level was estimated. Blood samples were collected in the red vial and after centrifugation serum were used for the analysis. Informed consent was obtained from all individual participants.

The studied population were divided into three groups according to their age. Patients with 1 to 15 years were included in group 1, while 16 to 45 years were included in group 2 and age 46 and above were included in group 3. Cases were divided into three groups according to the duration of asthma. Patients suffering from asthma for up to 10 years, 11 to 20 years and more than 20 years were included in group 1, 2 and 3 respectively.

Following are the values that indicate the serum vitamin D status of the individuals in our study.

Vitamin D level (ng/ml)	Status
<20	Deficiency
20-30	Insufficiency
30-100	Sufficiency
>100	Toxicity

Inclusion Criteria: Patients having physician diagnosed asthma.

Exclusion criteria: Patients with upper or lower respiratory tract infection, trauma, collagen vascular disease, malignancy, osteomalacia, rickets, smokers, alcoholics and pregnant women were excluded.

Statistical analysis: Data tabulated in Microsoft excel and analysis was performed by using Windows "SPSS" Version-19.0 in which a value of $p<0.001$ and $p<0.05$ considered highly significant and significant respectively. Results are expressed as mean ± SD.

RESULTS

The mean value of serum vitamin D was 17.98 ± 2.69 ng/ml in the cases of asthma and 55.56 ± 17.52 ng/ml in control group [Table 1] and the p value is <0.001 which shows that serum vitamin D level was significantly lower in asthmatic patients in comparison to the control group. Among the age groups of asthmatic patients there were no significant difference found but when compare the age of pat-

ients with controls there was highly significant difference found in serum vitamin D level [Table 2]. When we compared among duration of asthma, we found no significant difference [Table 3].

Table 1: Mean value of vitamin D level in cases and control.

Vitamin D level (ng/ml)	Cases (Mean ± SD)	Controls (Mean ± SD)	P value
	17.98 ± 2.69	55.56 ± 17.52	<0.001*

Table 2: Serum Vitamin D level in different age group of patients.

Age	Vitamin D level (ng/ml) (Mean ± SD)	P value
1-15 Year (n = 4)	18.42 ± 1.58	>0.5
16-45 years (n = 44)	18.18 ± 2.1	>0.5
46 and above (n = 52)	17.79 ± 2.59	>0.5

Table 3: Serum vitamin D level with duration of asthma.

Duration of asthma	Vitamin D level (ng/ml) (Mean ± SD)	P value
1-10 years (n = 76)	18.11 ± 2.69	>0.5
11-20 years (n = 20)	17.86 ± 2.83	>0.5
20 years and above (n = 4)	16.74 ± 2.27	>0.5

DISCUSSION

Vitamin D plays a significant role in inborn and adaptive immunity but still it is under discussion [11, 12]. It is estimated that vitamin D regulates over 900 genes [13]. The discovery of vitamin D receptor (VDR) connected vitamin D to the immune system [14]. Several researches suggested an autoimmune role of vitamin D due to its effects on immune cells such as T lymphocytes, B lymphocytes, and dendritic cells [15, 16, 17]. Enzyme released by the peripheral blood mononuclear cells associated with the activation and degradation of the active form of vitamin D which describes the hormonal action of 1, 25(OH2) D3. Specially, 25(OH) D3 has been metabolized to 1, 25(OH2) D3 by the T cells [18]. 1, 25(OH2) D3 form a complex with VDRs and perform their mechanism of action. This complex binds to vitamin D responsive elements inside the promoter region of vitamin D responsive genes which affects the rate of RNA polymerase II – mediated transcription [19]. The pathophysiology of asthma is explained by the host immune response which included Th1 cells, Th2 cells and CD4+ cells. Th1 cells secrete interferon γ (IFN-γ), interleukin (IL)-2 and TNF-α with cell mediated responses. Th2 secretes IL-4 and IL-5 with antibody mediated immunity [16]. Asthma is caused by increased level of Th2 cells which stimulate IgE production and promote eosinophilic airway inflammation and airway hyper-responsiveness [20, 21]. There can be one more reason responsible for vitamin D deficiency. Vitamin D has thermal instability. It is degraded at higher temperature

above 200°C. Therefore, slow cooking and deep frying of food destroy vitamin D. The reciprocal relationship is between thermal stability and temperature and time. During cooking vitamin D present in the food comes out into the cooking medium and degraded. Short time pressure cooking is suggested to retain some essential nutrients [22]. Li. Et al. conducted a study on 435 adults with asthma and found that the concentration of 25(OH) D was low in asthmatic patients [23]. Shaaban and Hashem also observed serum vitamin D levels in 75 adults with asthma and 75 healthy controls and found that 78.66% vitamin D deficient asthmatic patients whereas 85% of healthy controls expressed sufficient levels [24]. Similarly, Stephanie Korn et al. studied serum vitamin D levels in 280 adults with asthma and reported that 25(OH) D concentrations in adult asthmatics were low and vitamin D insufficiency or deficiency was significantly related to asthma severity [25]. Montero Arias et al. demonstrated that serum vitamin D levels were examined in 121 adults with asthma and noted that in asthmatic patients with low vitamin D levels there was a significant Association between vitamin D levels and the risk of severe asthma, the risk of hospitalization or visit to the emergency department due to asthma [26].

CONCLUSION

From the above study it can be concluded that, vitamin D plays a significant role in inborn and adaptive immunity and we found low serum vitamin D in asthmatic patients.

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Original Article

Potential Use of Single Measurement of Serum Progesteronein Detecting Early Pregnancy Failure

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Abstract

Introduction: Pregnancy failure is the dreadful event of the early sweetest period. There are several causes that can lead to this event. Actually, prediction of failure can reduce the incidence of this event. For that reason, it is thought that single measurement of serum progesterone can assume or predict early regarding the forthcoming demise of zygote. **Objective:** To determine the usefulness of single measurement of serum progesterone in detecting early pregnancy failure. **Materials & Methods:** It is a cross-sectional analytical study that was carried out among 100 early pregnancy period women in department of Obstetrics and Gynaecology Sir Salimullah Medical College and Mitford Hospital. Women who conceived spontaneously and presented with clinical evidence of abortion (PV bleeding and/ or pain) before 13 weeks of gestation. Serum progesterone level was measured in the patients and compared with control group. **Results:** The mean progesterone level in non-viable pregnancy was 20.42 ± 2.87 ng/ml while in viable pregnancy it was 45.69 ± 7.1 ng/mL. This was statistically significant. **Conclusion:** Serum progesterone is a very reliable and useful biomarker to detect early pregnancy failure.

Keywords: Serum progesterone, early pregnancy.

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Introduction

Maintenance of early pregnancy depends on the progesterone production by developing trophoblasts of placenta and corpus luteum of ovary. Vaginal bleeding and abdominal pain are the most common causes of early pregnancy failure. 30% of women who experience pain or bleeding in their first trimester (Perkins et al., 2000). These symptoms lead to anxiety and can be the first signs of a possible miscarriage of an ectopic pregnancy. Most women seeking medical advice have a transvaginal ultrasound scan to confirm a viable pregnancy, a miscarriage, or an ectopic pregnancy. However, even with expert use of transvaginal ultrasound, confirming if a pregnancy is intrauterine or extrauterine, it may not be possible in 8-31% of cases at the first visit (Condous et al., 2003). An observational study of pregnancies with inconclusive ultrasound results has shown that 50% spontaneously resolve (decreasing concentrations of ß human chorionic gonadot-

rophin (ß-hCG), 27% are subsequently diagnosed as viable, and 14% are diagnosed as ectopic pregnancies (Buckley et al., 2000). The high incidence of miscarriages and ectopic pregnancies in women with inconclusive ultrasound results warrants further tests to reach a diagnosis. Measurement of serum ß-hCG can be useful, but often more than one ß-hCG measurements is needed to make a diagnosis (Camejo et al., 2003).

Early pregnancy failure is a common pregnancy complication whereby 15% to 20% of clinically recognized pregnancies end up as abortions (Elson et al., 2003). Historical definitions of early pregnancy failure include threatened abortion, incomplete abortion, complete abortion, inevitable abortion and missed abortion with the outcome of or nonviable pregnancy (Day et al., 2009). In clinical practice, the time delay to distinguish viable from non-nonviable pregnancy is often distressing to patients and doctors (Dart et al., 2002). Ultrasound scanning is probably the best single diagnostic and prognostic test available for diagnosing early pregnancy failure. However, there were certain conditions where both the ultrasonographic evidence and clinical findings were indeterminate (Elson et al., 2003; Phipps et al., 2000). In addition, this technique is dependent upon the skill of the operator and thus the results are not always consistently reproducible. Therefore, a highly sensitive and specific biomarker is required to determine the pregnancy viability for early intervention.

Progesterone is a C-21 steroid hormone secreted by granulosa cells of the ovary. This hormone is important to promote endometrial decidualization by preparing the uterus for implantation of the blastocyst and in maintaining the pregnancy (Taghavi, 2004). Other important physiological function of progesterone is to inhibit smooth muscle contractility, decrease prostaglandin formation which help maintain myometrial quiescence and prevent the onset of uterine contractions, and inhibit immune responses like those involved in graft rejection. Among other maternal and placental hormones, progesterone is a potent immunomodulator that can affect the inflammatory pathway, leading to adverse pregnancy outcomes such as spontaneous abortion and hypertensive disorders (Challis et al., 2009; Dibble et al., 2014). In fact, low serum progesterone has been linked to early pregnancy vaginal bleeding and miscarriage (Arck et al., 2008). Vaginal bleeding in early pregnancy, in turn, is associated with complications later in the pregnancy which might be a consequence of placental dysfunction such as hypertensive disorders, preterm delivery (PTD), premature rupture of membranes (PROM) and preterm premature rupture of membranes (PPROM) (Lykke et al., 2010; Van Oppenraaij et al., 2009). It was previously determined by Valley et al. in 1998 that low serum progesterone in patients with no definite intrauterine pregnancy on endovaginal ultrasonography was suggestive of an abnormal pregnancy, and that serum progesterone 511 ng/mL (equivalent to 35 nmol/L) was the best cut-point to indicate abnormal pregnancies. In a study at KK Women's and Children's Hospital (KKH), Singapore, serum progesterone 535 nmol/L in the first trimester was found to be predictive of risk of spontaneous miscarriage at or before 16 weeks of gestation in women with threatened abortion (Ku et al., 2015).

Progesterone is one of the key factors that regulate trophoblastic Invasiveness (Miko et al., 2011). In addition, progesterone plays an essential role in the formation of normal spiral arteries in placenta (Simoncini et al., 2015), and the remodeling of spiral arteries usually begins in the latter half of the first trimester. It has been suggested that impaired cytotrophoblastic invasion and spiral arterial remodeling in early placentation contribute to the development of pregnancy complications, among them intrauterine growth restriction (Pijnenborg, Vercruysse & Hanssens, 2006). It may well be that low serum progesterone in early

pregnancy adversely affects trophoblastic invasion and spiral arterial remodeling, which results in impaired placentation.

Several studies have also shown that progesterone is the most specific biomarker for distinguishing viable from nonviable pregnancies (Midha et al., 2002). The concentration of serum progesterone is significantly higher in the viable pregnancy compared to nonviable pregnancy (Midha et al., 2002; Vitzhum et al., 2002). In Another study Hanita and Hanisah (2012) reported that the patients with threatened abortion in whom the pregnancy progressed to viability period had significantly higher progesterone values compared to those with nonviable pregnancy. Single measurement of serum progesterone was carried out during admission. The outcome of pregnancy was followed up until 22 weeks of period of amenorrhea to ascertain viability of fetus. Median progesterone levels were significantly lower in women with non-viable pregnancies compared with viable pregnancy. Progesterone levels were also significantly lower in threatened abortion patients with outcomes of nonviable pregnancy compared with pregnancies that progressed on to the viability period. At cut-off value of 32.7 ng/ ml, progesterone had 90% sensitivity with 75% negative predictive value and 92% specificity with 97% positive predictive value. The area under curve for progesterone was 0.95 (95% Confidence Interval, 0.903-0.990). These findings indicate that serum progesterone can be used as a marker for early pregnancy failure.

Maternal serum progesterone assay in first trimester of pregnancy is safe, non-invasive and affordable. The downfall of progesterone as a biomarker is due to the different cut-off values used by researchers (Dumps et al., 2002). The cut-off values were also determined on different study populations. Serum progesterone level is easy and reliable assay for determination of pregnancy outcome. Progesterone assays are currently available in most immunoassay platforms and have shown excellent performance in terms of assay sensitivity, specificity, accuracy and precision with rapid turnaround times. Furthermore, the cost per test for progesterone assay is affordable. The present study is aimed to determine the role of single measurement of serum progesterone in detecting early pregnancy failure.

Materials and methods

Our study was a cross sectional analytic study. It was carried out in the department of Obstetrics and Gynecology, Satkhira Medical College & Hospital, Satkhira, Bangladesh between the periods of May 2020 to April 2021.

A total of 100 women were included in this study. Women who conceived spontaneously and presented with clinical symptoms of abortion (PV bleeding and or pain) before 13 weeks of gestation were enrolled in the study. For all patients, the gestational age was calculated from last date of menstruation period (LMP) and early ultrasonography. All patients who are admitted in the inpatient Department of Obstetrics and Gynecology, Sir Salimullah Medical College and Mitford Hospital, Dhaka, Bangladesh during the study period and who fulfilled the inclusion criteria were enrolled.

Inclusion Criteria:

- Any gravidity and parity
- Maternal age between 20 and 35 years
- Gestational age between 6 and 13 weeks with vaginal bleeding and
- Singleton pregnancy.

Exclusion criteria:

- Multiple pregnancies.
- Anembryonic pregnancy
- Pregnant women getting treatment with progesterone
- Heavy smokers, diabetes mellitus
- Renal, trophoblastic and thrombophilic diseases
- History of endometriosis, leiomyoma
- Pregnant women with vaginal bleeding due to local causes- cervical polyp, cervical cancer, local trauma.
- Assisted pregnancies and ectopic pregnancies.

Results

Mean age of the participants (table 1) were 26.67 ± 4.91. Pregnancy outcome following ultrasonography is shown in table 2. After 22 weeks of gestation, the viable pregnancy (detected by USG) continued to be viable in 56% while became non-viable in 15% (Table 3). Serum progesterone level in subjects with viable pregnancy was 43.69 ± 7.1 ng/ml while that in non-viable pregnancy was 20.42 ± 2.87 ng/ml which was found statistically significant (p= <0.001) (table 4) after doing student's t test. Among the viable pregnancies (n = 55), 51 had normal serum progesterone while 4 had low serum progesterone, but in the non-viable pregnancy (n = 16), 5 had normal serum progesterone while 11 had low serum progesterone level (table 5) which was statistically significant by chi squared test. The ROC curve analysis demonstrated a significant ability of serum progesterone to differentiate between viable and nonviable pregnancies. The area under curve (AUC) for progesterone was 0.95 (95% CI, 0.903-0.990) with the parameters calculated from the ROC curve shown in Figure 1. When using a progesterone concentration of less than 32.7ng/ml as a cut-off value for the diagnosis of nonviable pregnancy, sensitivity was 90% (95% CI), specificity 92% (95% CI), the positive predictive value was 97% (95% CI) and the negative predictive value 75% (95% CI). Taking cut-off values of progesterone as 32.7ng/ml revealed that 90% of viable pregnancies and 92% of nonviable pregnancies had concentration of progesterone over and less the assigned threshold value of 32.7ng/ml respectively.

Discussion

The measurement of serum progesterone is a valuable test in the diagnosis of a pregnancy failure. The assay is inexpensive and the level changes little during pregnancy (Desforges, Carson & Buster, 1993). Recent studies suggest that serum progesterone measured in early pregnancy is the most powerful single predictor of pregnancy outcome in natural

Table 1: Age of the patients (n=100)

Age (years)	Number	Percentage
20-25	54	54
26-30	42	42
31-35	4	4

Table 2: Distribution of the participants according to pregnancy outcome following USG (n=100)

Variables	Frequency (%)
Viable pregnancy	71
Non-viable pregnancy	29

Table 3: Pregnancy outcome at 22 weeks of gestation in viable pregnancy patients (n = 71)

Variable	Frequency (%)
Continued to be viable	56
Become non-viable	15

Figure 1: Receiver operator curve (ROC) curve of progesterone level as diagnostic test for non-viable pregnancy.

Table 4: Association of serum progesterone level in subjects with viable and non-viable pregnancy (n=71)

	Viable pregnancy (n = 56) (Mean ± SD)	Non-viable pregnancy (n = 15) (Mean ± SD)	P value
Serum progesterone (ng/ml)	43.69 ± 7.1	20.42 ± 2.87	<0.001*

p value was calculated by student's t test
* significant

Table 5: Association of serum progesterone with pregnancy outcome (n = 71)

Serum progesterone	Pregnancy outcome		P value
	Viable (n = 55) Number (%)	Non-viable (n = 16) Number (%)	
Normal	51 (92.73)	5 (31.25)	<0.001*
Low	4 (7.27)	11 (68.75)	
Total	55 (100)	16 (100)	

conceptions (Elson et al., 2003; Al Jufairi, 2000; Phipps et al., 2000).

So, this prospective study was designed to detect the relation between serum progesterone and viability of the pregnancy during the first trimester.

One hundred (100) women sought medical attention due to vaginal bleeding and/or abdominal pain during the first trimester of their pregnancies and were included in this prospective study. The mean age of the studied population was 26.67 +4.91 years, the mean gestational age at progesterone assay was 9.2 ± 0.4 week and by the end of the first trimester, women included in this study were classified according to the viability of their pregnancies into viable pregnancy group 71% cases and non-viable pregnancy group (ended by miscarriages) 29% cases. In agreement with present study Abdelazim et al. (2012) reported the mean age of the studied population was 32.7 + 5.1 years, the mean gestational age at progesterone assay was 9.7 + 0.5 week and by the end of the first trimester, women included in this study were classified according to the viability of their pregnancies into; viable pregnancy group 178 (68.5%) cases and non-viable pregnancy group (ended by miscarriage) 82 (31.5%) cases.

The mean serum progesterone of the studied population was significantly high in viable pregnancy group (43.69 ± 7.1 ng/ml) compared to non-viable pregnancy group (20.42+2.87 ng/ml). Progesterone level and daily change in human chorionic gonadotropin (B-hCG) were determined in the serum of 307 patients with suspected ectopic pregnancy by Hahlin et al. (1991) and they found that 99% of the viable intrauterine pregnancies had serum

progesterone more than 30 nmol/l (9.42 ng/ml; nmol/1 = 0.314 ng/ml), whereas 75% of the ectopic pregnancy and 81% of the spontaneous abortions had serum progesterone less than 30 nmol/l (9.42 ng/ml) (Hahlin et al., 1991; Phipps et al., 2000).

In the present study among 56 patients with viable pregnancy 5(8.9%) had low serum progesterone level and 15 patients with non-viable pregnancy 11(73.3%) had low serum progesterone level. Low Serum progesterone is associated with non-viable pregnancy outcome ($p<0.001$). In agreement with our study Hanita et al. (2012) reported serum progesterone values were significantly lower in women with nonviable pregnancies, compared with those of women with viable pregnancy. In the viable group 5 patients had low progesterone level i.e <25ng/ml and were given exogenous progesterone as treatment. They continued to have viability and delivered smoothly. In the non-viable group 4 patients had normal progesterone level i.e >25ng/ml. On follow up it was found that they became non-viable. In additional progesterone there are many other factors which are essential for continuation of pregnancy. These factors one or two might be responsible for making the pregnancy non-viable.

The ROC curve analysis demonstrated a significant ability of serum progesterone to differentiate between viable and nonviable pregnancies. The area under curve (AUC) for progesterone was 0.95 (95% CI, 0.903-0.990) with the parameters calculated from the ROC curve. When using a progesterone concentration of less than 32.7ng/ml as a cut-off value for the diagnosis of nonviable pregnancy, sensitivity was 90% (95% CD. specificity 92% (95% CI), the positive predictive value was 97% (95% CI) and the negative predictive value 75% (95% CI) Similar findings repored Hanita et al. (2012).

Conclusion

From the above study it can be concluded that, serum progesterone is a very reliable and useful biomarker to detect early pregnancy failure.

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Original Article

Comparison of Early Outcome of Laparoscopic with Open Inguinal Mesh Hernioplasty

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ABSTRACT

Aim: To compare the early postoperative outcome of laparoscopic with open inguinal mesh hernioplasty in patients with inguinal hernia. **Study design:** Randomized controlled trial. **Place and duration:** Surgery department, Sadar Hospital, Satkhira Medical College & different private Hospitals in Satkhira district from 01-01-2015 to 30-12-2020. **Methods:** 50 cases of inguinal hernia diagnosed clinically were registered who fulfilled the inclusion criteria. The allocation of cases to two study groups was settled by random number table. The principal operative technique for Group A was laparoscopic hernioplasty and for Group B was open inguinal mesh hernioplasty. **Results:** 50 patients with diagnosis of inguinal hernia were included in study. 48 hours post operatively, 9(36%) patients experienced moderate to severe pain in group A while in group B, 12(48%) experienced moderate to severe pain. Similarly on 7th post operative day, 3(12%) patients in group A and 6(24%) in group B experienced moderate to severe pain. 1(4%) patient in group A while 2(8%) in group B developed wound infection. **Conclusion:** Laparoscopic hernioplasty is superior to open repair in the treatment of inguinal hernia, with less post operative pain and less risk of wound infection.

Keywords: Laparoscopic, open hernioplasty, inguinal hernia

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INTRODUCTION

Inguinal hernia is the commonest external abdominal hernia. Irrespective of country, race or socio-economic status, inguinal hernia constitutes a major health-care drain [1] and its repair is frequently performed accounting for 10–15% of all operations [2, 3]. Since the widespread adoption of mesh in primary hernia repair, recurrence has decreased from 10% to 1% [4]. In the past, stretching of the transversalis fascia was considered to be the most important factor [6]. Now it is believed that the strength of posterior wall of inguinal canal is due to muscles fibres of internal oblique and traversus abdominis [7]. There is evidence of increased risk of right inguinal hernia after appendicectomy [8]. Although some patients with inguinal hernia may be asymptomatic [9], worldwide, some 20 million inguinal hernia repairs are accomplished each year [10]. The various repair procedures fall under two categories: Fascial repairs and tension free prosthetic repairs which may be performed by open anterior approach or laparoscopically. The

fascial repairs are the oldest and they carry the highest incidence of post operative complications and recurrence [11]. In 1986 Lichtenstein introduced "tensionless" hernioplasty showing that the single most important factor in both recurrences and complications of hernioplasty comprised of ill-conceived attempts at approximating normally unopposed tissues under tension. This category of hernia repair is much more favored now a days [12]. The laparoscopic approach has a number of advantages that include less post operative pain, earlier return to full activity and that is why I wanted to undertake this study comparing efficacy of laparoscopic technique with that of conventional open anterior mesh hernioplasty in our local set up.

MATERIAL AND METHOD

Fifty cases of inguinal hernia fulfilling the inclusion criteria were selected from outpatient department. Patients were randomly allocated to two groups; group A for laparoscopic and group B for open mesh hernioplasty. The principal technique for group A patients was TAPP mesh hernioplasty and for group B was open anterior mesh hernioplasty (Lichtenstein's repair). Patients were evaluated post operatively at 48 hours and at one week to assess the severity of post operative pain. Then they were further followed up at day 7 and day 14 for any evidence of wound infection and post operative pain.

RESULTS

50 patients with diagnosis of inguinal hernia were included in study. Minimum age was 20 years and maximum 60 years with mean 43 yrs. All the subjects included in study were males. On clinical examination of either of the inguinal area, lump with expansile cough impulse was elicited in all 50(100%) patients. 30(60%) patients had (right) inguinal hernia and the rest 20(40%) had left inguinal hernia. 25(50%) patients in group A were operated with laparoscopic (TAPP) technique. While other 25(50%) patients included in group B were treated with conventional open mesh hernioplasty (Lichtenstein Repair). After 48 hours, 39(78%) patients experienced mild or no pain. However 14(28%) had moderate pain and 7(14%) had severe pain. Laparoscopic Hernioplasty group: 16(64%) patients had only mild or no pain while only 3(12%) patient experienced severe pain. 6(24%) patients had moderate pain. Open Mesh Hernioplasty group: Only 13(26%) had mild or no pain. 8(16%) had moderate and another 4(8%) had severe pain. Similarly on 7th post operative day, 41(82%) patients were having either no pain or mild pain. Out of remaining 9(18%) patents, 6(12%) had moderate pain while 3(6%) had severe pain. Laparoscopic Hernioplasty group: 22(44%) had mild or no pain while only 1(2%) had moderate and 2(4%) had severe pain. Open Mesh Hernioplastygroup: 19(38%) had mild or no pain. 4(8%) had moderate and 2(4%) had severe pain. Wound infection occurred in 3(6%) cases, out of which 2(4%) wounds were infected in group B (Open Mesh hernioplasty) and 1(2%) wound got infected in group A.

DISCUSSION

Use of a prosthetic mesh to create tension free repair as well as the laparoscopic technique has gained popularity for repair of inguinal hernia [5, 23]. Use of mesh is common and increasing [24] with the use of mesh in open hernia surgery resulting in tension free repair, the recurrence rate as well as rehabilitation period has reduced compared to sutured repairs [25]. Mesh repair has shown to reduce recurrence by 50% no matter what technique of mesh placement is used [26]. Stoppa and others

Table: Comparative frequency of postoperative events

Group	Frequency of pain at 48 hours			Frequency of pain at 7th POD			Wound Infection
	Mild	Moderate	Severe	Mild	Moderate	Severe	
A. Laparoscopic mesh hernioplasty	16(64%)	06(24%)	03(12%)	22(88%)	02(8%)	01(4%)	01(4%)
B. Open mesh hernioplasty	13(52%)	08(32%)	04(16%)	19(76%)	04(16%)	02(8%)	02(8%)

have used pre-peritoneal subumbilical approach to retro-fascial space since 1969 [27]. Advantages of this approach were the ease of separation of retro-fascial cellular space, direct access to posterior inguinal structures, clear understanding of hernial defects and clear exposure of the musculo-pectineal opening [28]. The study was carried out to compare early post-operative outcome of laparoscopic inguinal hernioplasty with open mesh hernioplasty in terms of early post-operative pain and wound infection. Fifty patients presented to out-patient Surgery department of Satkhira Medical college, Sadar Hospital, & different private hospitals in Satkhira district, were included in study. Patients were randomly allocated to two groups; group A for laparoscopic and group B for open mesh hernioplasty. The principal technique for group A patients was TAPP and for group B was open anterior mesh hernioplasty (Lichtenstein's repair). Pain was measured at 48 hours after procedure and on follow up at 7th postoperative day on visual analogue scale. Ziya A Anadol et al published a difference of 37.24 versus 20.92 in mean pain score (0-100) while comparing laparoscopic trans-abdominal approach with open repair [14]. In this study, considerably lower pain scores were observed after 48 hours in patients operated by laparoscopic technique where only 9(36%) patients experienced moderate to severe pain, compared with open technique. In open technique 12(48%) patients had moderate to severe pain. This is comparable with the results of Ziya A Anadolet al [14]. This significant difference in pain scores persisted even after day 7. At 7th post-operative day, 3(12%) patients had moderate to severe pain in laparoscopic group while in open group, 6(24%) patients had moderate to severe pain. M C Misra et al compared laparoscopic with open repair of incisional and primary ventral hernia showing remarkably lower rate of wound infection in laparoscopic group (6 % versus 33 %) [13]. In our study, rate of wound infection was higher in group A. Hence, laparoscopic hernioplasty was observed to have lesser risk of wound infection, though not that much significant as shown by M C Misra et al. 2(2.9%) patients in open hernioplasty group and 1(4%) patient in laparoscopic group developed wound infection. However due to requirement of expensive Cidex solution to sterilize laparoscopic instruments and substandard sterilization in our setup, infection rate may be a little higher as compared to that described by Haq RN [29].

CONCLUSION

This randomized controlled trial concludes that laparoscopic inguinal hernioplasty is better than open anterior mesh hernioplasty in terms of less post-operative pain and low risk of wound infection. However, requirement of general anesthesia and increased estimated time and cost of surgery make it unpopular both among surgeons and patients. Also, long period of follow up is required to assess the exact efficacy of this technique.

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