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EDITORIAL OFFICE:

Department of Microbiology, Sylhet MAG Osmani Medical College
Telephone: 0821-717051, Extension: 111, 0821-711556
Email: somc@gononet.com

Teachers Association, Sylhet MAG Osmani Medical College

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ORIGINAL ARTICLE

The Osmani Medical Teachers Association Journal Volume 3 Number 1

Abdominal Wound Dehiscence: Aetiological Study

MD. MUSTAQUE AHMED BARBHUYIAN[a], *PROMODE RANJAN SINGH[b], CHOWDHURY HUMAYUN KABIR[c]

Abstract

Fifty cases of abdominal wound dehiscence have been studied in an attempt to assess the etiological factors. The condition is more common in man than woman, and maximum incidence occurs in the third decade. Certain factors, recognizable before operation, which are associated with an increased risk of dehiscence include anaemia, hypoproteinemia, jaundice and uraemia. The factors can be minimized by preoperative correction. The important post-operative factors associated with dehiscence are almost all related to increased mechanical stress on the wound, cough, vomiting and abdominal distension, causing raised intra-abdominal pressure in majority of the cases. Preoperative breathing exercise may improve pulmonary status and limit the amount of post-operative severe coughing. Proper post-operative management by nasogastric suction may reduce the incidence of abdominal distension. Wound infection was present in a significant number of cases. In the present study, no difference in relation to dehiscence has been shown between various suture material and method of closure. Because all cases were closed in layer- by- layer method, catgut is used in deeper facial layer and silk at skin. Breaking of suture material or slipping of knot should be avoided by careful selection of material and good technique. Problem of stitch cutting through the margin can be avoided by including adequate bite of tissue within the suture and mass closure technique. Standard measures to obtain proper wound haemostasis prevents haematoma formation, close attention to aseptic techniques minimizes wound infection. Wound dehiscence occurs more frequently in patients undergoing emergency abdominal surgery than elective laparotomy. The direction of incisions seems to bear influence on the wound dehiscence. Vertical incisions were more prone to develop dehiscence. Prolong hospitalization is the main morbidity. Majority of dehiscences seen at 9th post-operative day in our series.

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[a] Assistant Professor, Department of Surgery
[b] Assistant Professor, Department of Urology
Sylhet M.A.G Osmani Medical College.
[c] Former Professor and Head, Department of Surgery IPGMR, Dhaka

* Corresponding author

Introduction

Wound dehiscence is an undesirable complication of abdominal surgery. Its incidence is not uncommon in our surgical practice. It accounts for considerable disability to the patient and invite newer problems during the treatment of the primary disease.[1]

Wound dehiscence is a multifactorial problem. Both local and systemic factors play important role.[2] Besides this, technique of closure and experience of the surgeon also have important roles. A number of factors contribute to the wound dehiscence. In patients with existing predisposing conditions, extra preventable measures should be taken at the time of wound closure in order to decrease the incidence of wound dehiscence. Undoubtedly, diminished incidence of abdominal wound dehiscence is beneficial to patient regarding morbidity as well as mortality, and help the surgeon to avoid facing any undesirable problem. Safe surgery which will be highly economical to the poverty ridden population of a country like ours.

The study has been undertaken to review a series of abdominal operations complicated by wound dehiscence. An effort has been made to identity the predisposing factors related to its aetiology and categorize these according to their importance. An endeavour was made to aware the surgeons, particularly the younger ones of the factors responsible for wound dehiscence. Suggestions are made to minimize the incidence of wound dehiscence.

Methods

For the purpose of this study, 50 (fifty) cases of abdominal wound dehiscence occurring in Sylhet MAG Osmani Medical College and Dhaka Medical College Hospitals, during the period from January to December, 1989, were reviewed. The patients were admitted for various surgical and gynaecological problems and underwent abdominal surgery. Both complete and partial dehiscence were taken into account and routine and emergency cases in all age groups were included.

The case notes of the patients were studied to obtain the information regarding initial complaints of the patients for admission, and findings of general examination with special reference to nutritional status, anaemia, oedema and jaundice.

Clinical diagnosis of the patients and indications for laparotomy were found out. Age, sex of the patients, site and type of incision, such as midline, paramedian, oblique muscle splitting and transverse, were recorded.

From the operation notes of the cases, post-operative findings and detail operative procedure including drainage of the abdominal cavity were obtained.

An account of the problem faced during closure were considered, such as haemostasis, excessive tension at the suture line and stitch cutting out from the wound margin and also technique of closure, whether mass closure or layer-by-layer closure. Types of suture materials used were found out and classified as absorbable and non-absorbable.

An attempt was made to relate the experience of operating surgeon to the frequency of abdominal wound dehiscence.

An examination of complicating factors during the immediate post-operative course of these patients with disrupted wound was made in order to elicit any possible correlation with the incidence of disruption. These were: any violent respiratory distress, cough, any post-operative vomiting, straining in micturation and abdominal distention.

The post-operative day on which the dehiscence took place was noted and relevant investigations, which were required for a particular case, were carried out such as blood for Hb%, TC, DC, blood urea, blood sugar level (fasting), serum total protein and serum bilirubin, x-ray chest and plain x-ray abdomen. Bacteriological study of the wound discharge was carried out and presence of any associated disease, such as pulmonary tuberculosis, diabetes mellitus, bronchial asthma, uraemia and malignancy were sought.

History of previous intake of steroid and radiotherapy was taken into account to correlate with the aetiological factors.

Results

A total of 50 cases of abdominal wound dehiscence were reviewed, among which patients of all age groups were included. Youngest patient in the series was only 9 months old baby, who underwent abdominal surgery for intra-abdominal lump, and the oldest was a 75 years old man, operated for cholelithiasis. Highest incidence (34%) of dehiscence found in 21-30 years age-group. (Table I)

Table I: Age distribution of the patients under study

Age group (Years)	No. of cases (n=50)	Percentage
0-10	01	02
11-20	05	10
21-30	17	34
31-40	09	18
41-50	07	14
51-60	08	16
61-70	01	02
Above 70	02	04

Considering sex incidence among the cases, it is found that majority of the patients (64%) were male. The male and female ratio is 1.77: 1. (Table II) Incidence of partial dehiscence was found more than complete dehiscence. (Table III) Complete dehiscence with extrusion coil was present in only 8 cases. More incidences of dehiscence were found in emergency laparotomies and comprise about 70% of the total cases studied. (Table IV)

Table II: Sex incidence of the enrolled cases

Sex	No. of cases (n=5o)	Percentage
Male	32	64
Female	18	36

Table III: Incidence of dehiscence (complete/partial)

Type of dehiscincc	No. of cases (n=5o)	Percentage
Complete	08	16
Partial	42	84

Table IV : Relationship of dehiscences with Laparotomy (routine/emergency)

Type of Laparotomy	No. of cases of dehiscence (n=5o)	Percentage
Routine	15	30
Emergency	35	70

Regarding indications for abdominal operation, it is found that the highest number of cases were intestinal obstruction among the surgical cases, and Caesarean section for obstructed labour among gynaecological cases. (Table V)

Table V: Indication for laparotomy

Indications	No. of cases (n=50)	Percentage
SURGICAL		
1. Chronic cholecystitis	06	12
2. Pyloric stenosis due to chronic duodenal ulcer	03	06
3. Benign enlargement of prostate	01	02
4. Appendicitis	02	04
5. Perforation of ch. duodenal ulcer	03	06
6. Typhoid ulcer perforation	02	04
7. Sigmoid volvulus	02	04
8. Appendix abscess	02	04
9. Intra-abdominal abscess	03	06
10. Intestinal obstruction	11	22
11. Carcinoma Stomach	01	02
12. Retroperitoneal growth	01	02
13. Diagnostic exploration	02	04
GYNAECOLOGICAL AND OBSTETRICS		
1. Obstructed labour	08	16
2. Uterine fibroid	01	02
3. Vesicovaginal fistula	01	02
4. Rupture uterus	01	02

Considering the relationship of incidence of abdominal wound dehiscence with types of incision used, it is found that vertical incisions were more prone to develop dehiscence than the transverse incisions. (Table VI) More incidences of dehiscence were found to occur among the surgeries done by junior surgeons, i.e. assistant registrars. (Table VII)

Table VI: Relationship of wound dehiscences with type of incisions used during surgery

Type of incision	No. of cases (n=50)	Percentage
Vettical	46	92
Upper midline	05	10
Lower midline	09	18
Paramedian	32	64
Transverse	04	08
Suprapubic	01	02
Grid iron	03	06

Table VII: Relationship of abdominal wound dehiscence with grades of surgeon

Grade of surgeon	No. of cases (n=50)	Percentage
Assistant Registrar	26	52
Registrar	03	06
Resident Surgeon	07	14
Consultant/ Professors	14	28

Among the cases studied, excessive tension at the suture line was more common. But in majority of cases, there was no such problem during closure. (Table VIII)

Table VIII: Problem during closure of abdominal incision

Problems	No. of cases (n=50)	Percentage
Excessive tension at suture line	09	18
Stitch cutout from the wound margin	08	16
Haemostasis diffcult	05	10
No problem	28	56

Among the dehiscenc cases, drain used through separate stab was in 26 (54%) cases, whereas only in three cases, drains were through same abdominal wound. In 21 (42%) cases, drains were not used. (Table IX) Regarding associated pathologies, anaemia was present in 30 (60%), hypoproteinemia in 5 (10%), jaundice in 2 (4%) and uraemia in only 1 case. (Table X)

Table IX: Abdominal wound dehiscence- use of drain

Drain	No. of cases (n=50)	Percentage
Through separate wound	26	54
Through same wound	3	6
No drain used	21	42

Table X: Results of relevant investigation

Findings	No. of cases (n=50)	Percentage
Anaemia	30	60
Hypoproteinemia	05	10
Jaundice	02	04
Uraemia	01	02
No abnormality	01	02

Immediate post-operative complaints significantly associated with the cases of wound dehiscence were cough (64%), abdominal distension (30%), respiratory distress (20%), and vomiting (16%). (Table XI) Associated diseases supposed to act as causative factors were present in very few cases. Malignancy was present in 6 (12%) cases, 40 (80%) cases were free from any associated disease. (Table XII)

Table XI: Immediate post-operative complaints

Complaints	No. of cases (n=50)	Percentage
Cough	32	64
Vomiting	08	16
Abdominal distention	15	30
Straining in micturation	05	10
Respiratory distress	10	20
No such complaint	01	02

Table XII: Associated disease of patients

Associated disease	No. of cases (n=50)	Percentage
Pulmonary	02	04
Bronchial asthma	02	04
Malignancy	06	12
Diabetes mellitus	00	00
No associated disease	40	80

Majority among the organisms identified from the culture of wound discharge at the time of dehiscence were *Staphylococcus* (36%). Next common infecting organism found was *Escherichia coli.* Culture of 7 (14%) cases showed no growth of organism. (Table XIII)

Table XIII: Bacteriological study of discharge of wound

Organisms	No. of cases (n=50)	Percentage
Staphylococcus	18	36
Escherichia coli	13	26
Streptococcus	02	04
Proteus species	01	02
Mixed	09	18
No growth	07	14

Discussion

In spite of advances in surgical techniques and material in recent years, wound dehiscence continues to play a role in post-operative morbidity and mortality. Incidence of dehiscence complicating laparotomies varies according to the operations and the underlying pathology. Defective healing of wounds is related with wound dehiscence.

General factors as the age of patient, presence of anaemia, malignancy, diabetes, systemic infection, Jaundice, uraemia, hyporoteinemia, vitamin C deficiency, use of steroid and cytotoxic drugs are related to dehiscence.

In our series, we tried to identify the factors or combination of factors that are responsible for defective wound healing and hence abdominal wound dehiscence was found in 50 cases.

In this series of 50 cases, complete dehiscence of abdominal wound with extrusion of viscera was present in 8 (16%) cases. This reflects that partial dehiscence is more common than complete dehiscence.

Regarding the urgency of intervention, it may be concluded that wound dehiscence occur more frequently after emergency operations. A total of 70% of our cases underwent emergency laparotomy and 30% elective.

Indication of laparotomy in the present series is mostly surgical and few are gynaecological. Twenty percent of patients were found to present with infective intra-abdominal pathology, such as intra-abdominal abscess, appendix mass, and perforation of hollow viscus.

A comparison of experience of the surgeons was carried out. In this series, most of the dehiscence occurred in hands of junior surgeons. Emergency laparotomies were mostly performed by junior surgeons. Poor surgical technique may be a contributing factor in hand of junior surgeon. Similar findings were noted by Bucknall *et al* in 1982.[3]

Type of incision, suture material and method in closure play a key role in disruption. In our group, there were very few transverse incisions that lead to wound dehiscence as compared to vertical incision. In the series, 32 cases had paramedian incisions and only 4 cases had transverse incisions, the former techinque saves time and give adequate exposure. Transverse incision always affords a high degree of protection, and dehiscence following these incisions is rare.

For the first few days after operation, the integrity of wound is maintained entirely by the suture material used for closure. These have to withstand all the mechanical stress applied to wound and keep the cut edges opposed, until healing process get underway. The wound begins to gain strength over the next 14 to 21 days. In all of our cases, suture material was used in peritoneum and facial layers, absorbable chromic and continuous stitches were given. But skin closure was done by interrupted silk stitches.

Tissue tear may take place if the tissue is destroyed by infection and tight closure. Suture holding capacity of tissue depends on the direction of fibres, the distance from cut edge at which the suture has been inserted and bulk of the tissue embrace by the suture. During closure of wound, excessive tension of suture line was present in 18% cases. Mechanical stress produced by excessive tension may cause rupture of suture material and loss of alignment of wound edge. Stitch cutting out from the wound margin was recorded in 16% cases. These were probably due to friability of facial layers caused by peritonitis.

Difficult haemostasis found in few cases, probably due to excessive oozing from margin, leading to heamatoma formation, which facilitates infection of the wound. Most precise haemostasis at the time of closure reduce the number of haematoma formation.

The result of study shows appearance of dehiscence highest at 9th post-operative day, mostly partial dehiscence. Five cases of complete dehiscence took place at 6th post-operative day and two complete dehiscence occurred at 4th post-operative day. It thus appears highly probable that causes of early disruption are on a technical basis and suture dissolution. However, late disruptions are associated with haematoma formation, anaemia, wound infection, hypo-proteinaemia, etc. Alexander and Prudden (1966) found average day of dehiscence at 6-8 post-operative day.[1]

Drainage of abdominal cavity given through a separate stab wound in 54% of cases and through the same abdominal wound in only 6% of cases. General factors associated with disruption were present in some of our cases. Thirty (60%) of our cases were anaemic. It contributed on dehiscence by producing hypoxic affect at healing area. Hypoprotienemia found in 10% cases contributed to dehiscence by the defective synthesis of collagenous ground substance at the site of wound healing. Alexander and Prudden (1966) mentioned contribution of anaemia and hypoproteinemia on causation of dehiscence.[1]

Jaundice was present in only 4% cases and uraemia in 2% cases. Jaundice was associated with reduction in wound strength due to delayed formation of fibroblast and new blood vessel.

Four patients in this series had history of steroid intake, of which one was for bronchial asthma. The use of steroids on the usual therapeutic dose is believed to have no clinical effect on healing of wound. But massive dose of steroid exert adverse effect and usually massive dose of steroid intake is rare. There were only 8% cases of steroid intake in the present study. Only one patient (2%) in our series had got history of radiotherapy before operation.

Immediate post-operative complaints, such as respiratory distress, cough, vomiting, straining in micturation and abdominal distension were present in almost all of our patients. They all produced mechanical stress on the suture line. Cough was the most prominent complain. These caused adverse effect on suture material, because at early post-operative period, the strength of abdominal wound is maintained by suture material mostly. The finding of all these factors in most of our cases denotes that these had got important influence in causation of the dehiscence.

Malignancy, pulmonary tuberculosis, bronchial asthma and uraemia as an associated contributing disease, present in limited number of our cases. Eighty percent of our cases were free from such diseases, thus seems that their role is not much significant in our cases. However, Alexander and Prudden (1966) suggest that carcinoma alone has little or no effect on the disruption of abdominal incision.[1]

Surprisingly among these 50 patients, none had diabetes mellitus. This may be because of well control of diabetes preoperatively. Diabetes in good control has got little effect on wound healing.

At the time of dehiscence, 86% of our patients had positive culture. Recovered organisms were: *Staphylococcus, E. coli, Streptococcus, Klebsiella, Pseudomonas* and *Proteus*. Incidence of *Staphylococcus* infection was more. Obviously, infection plays important role in the pathogenesis of the dehiscence. Routine irrigation of wound with antiseptic may minimize infection. High rate of infection may be due to repeated contamination of wound from hospital sources. In spite of antibiotic used, infection was found in most of our cases. These may represent inappropriate use of antibiotic without proper culture and sensitivity. Modern surgical management has made it possible to treat infections effectively and efficiently a complication previously associated with high mortality. Wound dehiscence, when properly managed, is no longer a lethal situation.

Thus, the incidence of abdominal wound dehiscence may be diminished or eliminated by the recognition of certain risk factors and the application of specific technical procedure related to wound management.

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ORIGINAL ARTICLE

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Experiences with Blood Culture in an Urban Hospital of Dhaka City: A One-year Study

*SABEENA SHAHNAZ[a], MOHAMMAD MURSHED[b], SHARIFUL ALAM JILANEE[c], MUNIR HASSAN[d]

Abstract

A prospective study was conducted at Microbio-logy department of Holy Family Red Crescent Medical College, from June, 2002 to June, 2003 to find out the positive isolates in blood culture. The most common bacteria isolated were the Salmonellae (85.36%). A total 722 blood samples were cultured in broth system. The highest number of Salmonellae positive patients (62.86%) was noted in the first week of fever. Throm-bocytopenia was seen in 13 out of 35 *Salmonella* positive patients. The highest number of positive cases (58.5%) was in the age group 13-30 years. Salmonella positive cases were also investigated with widal tests. *Salmonella typhi* was resistant to amoxicillin and co-trimoxazole. No resistance was seen among Salmonella against ciprofloxacin, ceftazidime, ceftriaxone. In one case, a positive result with IgM-band in dengue Immunochromatographic test was found.

[OMTAJ 2004; 3(1): 7-10]

Introduction

Blood culture is a common technique, advised by the clinicians to diagnose infections, when the microorganisms are suspected to produce fever and invade the blood stream, the leading cause of which is enteric fever in Bangladesh.

Holy Family Red Crescent Medical College Hospital is an urban secondary hospital, where patients come for treatment, mainly from the upper and middle class family. Blood culture was carried out by the lytic system before June 2002 in this institution. As the process of incubation was cumbersome and positive yield of samples were very few, so broth system of blood culture was replaced. This study was done to compare the two methods and to compare the culture positive enteric fever cases with widal test, blood count and dengue ICT.

[a] Associate Professor

[b] Assistant Professor
Department of Microbiology, Holy Family Red Crescent Medical College, Dhaka, Bangladesh.

[c] Associate Professor, Department of Microbiology, Ibrahim Medical College, Dhaka, Bangladesh.

[d] Associate Professor, Department of Microbiology, National Medical College, Dhaka, Bangladesh.

* Corresponding author

Methods

From June, 2002 to June, 2003, 722 blood samples were cultured in broth system. Under aseptic precautions, 5 ml of blood was inoculated into bottles containing 50 ml of tryptone soya broth. The bottles were incubated at 37^0 C up to 72 hours. Each day, those were observed for turbidity and sub-cultured on Blood, Mac Conkey and Chocolate agar plates. Colonies developed were subsequently identified by using standard techniques.[1-5] Sensitivity tests were done by the disk diffusion technique, using Muller Hilton agar.[6] In the culture positive cases, duration of fever was obtained from the patients' records. Salmonella positive cases were compared with widal tests. Results of the blood count were noted in all of the enteric fever cases.

Results

A total 722 blood samples were cultured in broth system under the study period. Month-wise distribution shows that the highest number (106, 14.7%) of collection of blood was done in August 2002 and the rate of positivity was highest (11, 26.8%) during August 2002. (Table I) Out of the total 722 samples processed in broth system during 2002-03, 41 (5.38%) yielded positive results. The most common bacterial isolates were the Salmonellae, 35/41, 85.36% (*S. typhi*-19, and *S. paratyphi A*-16). (Table II)

The age distribution of the patients shows that the highest number of positive cases (58.5%) were in the age group 13-30 years. (Table III)

The highest number of Salmonella positive patients was found in the first week of fever (22 out of 35, 62.86%). (Table IV)

The widal test was done in 24 out of the 35 Salmonella positive cases, which showed the significantly high titres of TO in three *S. typhi* and one *S. paratyphi A* positive cases. (Table-V) Of the 41 samples showing bacterial growth, 26 (63.41%) were positive in 72 hours, while 13 (31.71%) were positive in 48 hours, and only 2 (2.82%) samples yielded growth in 24 hours.

Table-I: Collection of blood and the rate of positive samples from June-02 to June-03

Months	No (%) of blood samples	
	Cultured (n=722)	Yielded bacterial growth (n=41)
June-02	18 (2.49)	04 (9.76)
July-02	77 (10.66)	06 (14.63)
Aug-02	106 (14.68)	11 (26.83)
Sep-02	89 (12.33)	07 (17.07)
Oct-02	89 (12.33)	01 (2.44)
Nov-02	42 (5.82)	04 (9.76)
Dec-02	39 (5.40)	01 (2.44)
Jan-03	28 (3.88)	00 (00)
Feb-03	31 (4.29)	00 (00)
Mar-03	34 (4.71)	01 (2.44)
Apr-03	81 (11.22)	02 (4.88)
May-03	70 (9.70)	03 (7.32)
June-03	18 (2.49)	01 (2.44)
Total	722 (100)	41 (5.68)

Table-II: Isolation of organisms in blood culture

Organism	Number	Percentage
Salmonella species	35	85.36
Escherichia coli	04	9.76
Pseudomonas species	01	2.44
Klebsiella species	01	2.44
Total	41	100

Table III. Age distribution of the positive cases

Age in years	No of positive cases	Percent
13-30	24	58.54
31-50	09	21.95
Above 50	08	19.51
Total :	41	100.00

Table IV: Duration of fever in Salmonella positive cases (n=35)

Duration	No of cases	Percent
1st week	22	62.86
2nd week	08	22.86
3rd week	01	02.85
4th week and more	04	11.43
Total :	35	100.00

Table V: Significant titres in Widal test among Salmonella culture-positive cases (n=24)

Organism	No (%) of culture-positive cases against significant Widal test titres		
	TO 1:160	TH 1:160	AH 1:160
S. typhi	03 (12.50)	10 (41.67)	03 (12.50)
S. paratyphi A	01 (4.17)	03 (12.50)	04 (16.67)

Table VI: Thrombocytopenia in Salmonella-culture-positive cases

Organism	No. of cases against total thrombocytes/cu mm			
	90-140,000	80-90	50-80	Below 50
S. typhi (n=19)	07	Nil	Nil	Nil
S. paratyphi A (n=19)	04	01	01	Nil

Dengue ICT was done in only 6 of the Salmonellae positive cases and only one case gave a positive result with the IgM band. Two clinically positive cases of dengue were bacteriologically positive for *Pseudomonas* and *E. coli* in blood C/S but Dengue ICT was not done in those cases. Thrombocytopenia was seen in 13 out of 35 salmonella positive patients. (Table-VI) The antibiotic sensitivity pattern showed that *S. typhi* were resistant to amoxicillin and co-trimoxazole. Only one multi-drug resistant strain was found among Salmonellae isolates. (Table VII)

Table VII. Sensitivity pattern of the Salmonellae isolates

Organisms	No. of isolates distributed into susceptibility categories of antibiotics tested																	
	AML			TS			C			CIP			CRO			CAZ		
	S	M	R	S	M	R	S	M	R	S	M	R	S	M	R	S	M	R
S. typhi (n=19)	15	-	04	15	-	04	16	02	01	19	-	-	19	-	-	19	-	-
Percent	79	-	21	79	-	21	84	11	05	100	-	-	100	-	-	100	-	-
S. paratyphi A (n=19)	13	01	02	13	01	02	16	-	-	16	-	-	16	-	-	16	-	-
Percent	81	06	13	87	-	-	100	-	-	100	-	-	100	-	-	100	-	-

AML- amoxicillin, TS- co-trimoxazole, C- chloramphenicol, CIP- ciprofloxacin, CRO- ceftriaxone, CAZ- ceftazidime

Discussion

The present study was undertaken to evaluate the broth system of blood culture in isolating bacteria from blood. Some 5.68% of the samples yielded positive result. In the previous year, only 1 out of 105 (0.9%) samples were positive by lytic system. [unpublished information] Thus the broth system came out as superior to lytic system.

Salmonellae found as the major blood isolates, the rate of positivity was highest after 72 hours. No further incubation was carried out after that period due to shortage of space in the incubator. Hasaan *et al* in Bangladesh, as reported in 1995, found that there was no increase in isolation beyond 72 hours of incubation.[7] Previous works used to carry out the incubation beyond seven days.[7-9] Short incubation time in this study might be due to the use of sodium polyanethol sulphonate (SPS), which acts as anticoagulant, anti-complementary and has antiphagocytic effects as well.[10]

These culture positive cases of enteric fever were also tested for widal test and blood cell count. All the patients were having normal count and no good correlation could be achieved between widal and culture positivity. In the culture positive enteric fever cases, most of the patients (82%) were in the first week of fever, but we also got *Salmonella* positive blood culture in 2nd, 3rd, and even 4th week of fever. So, we can advise for blood culture even the fever has extended beyond the first week. Thrombocytopenia was observed in 32% of the patients among all those enrolled between June to November, 2002. One case was diagnosed as dengue, and in two cases ICT for dengue was positive. Whether the thromcytopenia was related to dengue, it is not clear. Further studies may be carried out to see the rate of double infection (Salmonella and Dengue).

Outbreak of typhoid fever, resistant to various drugs, have been reported from different parts of the world[11,12] as well as in Bangladesh.[13,14] But recent studies from different parts of the subcontinent have shown that there is a change in the drug resistance of Salmonellae. Chandi *et al* [15] in India found multi-drug-resistant (MDR) *S. typhi* in 91% of patients with enteric fever, whereas during 1996-97, he found no MDR. Ranju *et al* [16] in India also have observed that resistance to three conventionally used drugs (amoxicillin, cotrimoxazole and chloramphenical) have decreased from 35% to 20%. In Bangladesh, Asna *et al* [17] found that *S. typhi* isolates from patients during 1996-98 also showed decreases in sensitivity from 59.0% to 45.6%. In the present study, blood isolates of salmonellae showed minimum resistance. In this region in the last few years, there has been an increasing tendency to use ciprofloxacin and 3rd generation cephalosporins in enteric fever. The clinicians are not using amoxicillin, co-trimoxazole, and chloramphenical very frequently. It is probable that the drug resistance strains have been eliminated. But we should be cautious about the drug resistance because some of the Gram-negative organisms like *E. coli* and *Klebsiella* have developed an enzyme, extended spectrum beta lactamase (ESBL), which can degrade the 3rd generation cephalosporins.

The other blood isolates were *E. coli*, *Pseudomonas* and *Klebsiella*. The *E. coli* and *Klebsiella* cases were from the UTI and renal failure, and two clinically diagnosed cases of dengue showed the growth of *Pseudomonas* and *E. coli*. In this study, three dengue patients (two clinically and one positive for IgM) showed bacteremia. Whether dengue predisposes to bacteremia, it cannot be calculated from such a small study but this point needs further evaluation. So, blood culture remains one of the main stay of diagnosis of infectious diseases.

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ORIGINAL ARTICLE

The Osmani Medical Teachers Assocation Journal Volume 3 Number 1

Operative Management of Supracondylar Fracture of the Humerus

*QAMRUL ALAM SALEH[a], KAZI MD. SALIM[b], ABUL BASHAR CHOWDHURY[c], DIPANKAR NATH TALUKDER[d], MA GAFFAR[e]

Abstract

Supracondylar fracture of the humerus is a common fracture in children in our country. Some 25 cases of extension type III supracondylar fracture of humerus were treated in Sylhet MAG Osmani Medical College Hospital from January 2002 to June 2003 by open reduction and percutaneous K-wire fixation. The purpose of the study was to evaluate the results of surgical treatment of type III supracondylar fracture of the humerus in children. Age of the patients were between 6 to 11 years (mean 8.5), 19 patients were male (76%) and 6 (24%) were female. All patients were attempted closed reduction under general anaesthesia. All patients were admitted on the same day of injury and operation was performed within 3 to 7 days of admission. Total hospital stay was between 5 to 9 days. Patients were followed in OPD and results were evaluated. Excellent result was found in 16 (64%), good in 7 (28%) and poor in 2 (8%) cases. Further study involving large number of cases with long term follow up is necessary to see the future outcome of surgical treatment.

[OMTAJ 2004; 3(1): 11-12]

Introduction

Supracondylar fracture of children is a common fracture in our country that has to be managed by orthopaedic surgeon in hospital or private practice. More than 95% of supracondylar fractures are of extension type which is again classified by Gartland as type I, type II and type III (I-undisplaced, II-displaced, and III-displaced with no cortical contact).[1]

[a] Associate professor (cc)

[b] Assistant professor (cc)

[c] Associate professor (cc)
Department of Orthopaedics Surgery, Sylhet MAG Osmani Medical College

[d] Consultant, Orthopaedics, Sadar Hospital, Sylhet.

[e] Consultant, Orthopaedics, Sylhet MAG Osmani Medical College Hospital

* Corresponding author

Typle I and II can be nicely managed non-operatively but type III fractures are very difficult to reduce by close manipulation in which inadequate reduction may result in cubitus varus deformity or loss of elbow movement.[2]

The present study was designed to evaluate the results of surgical treatment of type III supracondylar fracture of humerus in children.

Methods

A prospective study was made in SOMCH from January 2002 to June 2003, where 25 cases of type III supracondlylar fracture were selected for open reduction and percutaneous K-wire fixation. All patients were attempted closed reduction under G/A.

Open fracture or fracture with neurovascular complications were not included in this study. All the patients were admitted in the day of injury. Preoperative x-ray of the elbow AP (antero-posterior) and lateral view was assessed for Baumans angle, crescenting, metaphysioepiphyseal angle and anterior spike.[3] Limb was elevated in Dunlop traction to reduce swelling.[4] Operation was performed within 3 to 7 days of admission under general anaesthesia with strict aseptic condition. In all cases, lateral approach was used. After reduction, stabilisation was done by two K-wires given either both from the lateral side or one on either side.[5] Wound was closed in layers keeping a drain and a long arm posterior slab was given. Drain was removed on the 2nd post-operative day and the patient was discharged from the hospital. Average hospital stay was 6 to 9 days. Stitches were removed between 10 to 12 days and advised to attend in OPD every week. Posterior slab was removed on the 3rd week and gentle mobilization started on a collar cuff sling. K-wires were removed on 6th week, after which assisted elbow movement was given for next 8 weeks.[6] Then active exercise started and radiological assessment done. Each of the patients was advised to attend every 2 weeks for 3 months and then every month for 6 months. Results were assessed on functional recovery, radiological assessment and complications.[7]

Results were classified arbitrarily as Excellent, Good and Poor on the basis of following criteria:

Excellent: almost normal range of elbow movement, normal anatomical alignment and union, and no complications.

Good: some restriction of movement, with satisfactory alignment and union, and have infection.

Poor: movements much restricted with poor alignment, and neurovascular complications.

Result

A total of 25 children with type III supracondylar fracture of the humerus were treated. Age of the patients were between 6 to 11 years (average 8.5 years), 19 (76%) patients were male and 6 (24%) were female. Of them 15 (60%) had right-sided and 10 (40%) had left-sided involvement.

Excellent results were obtained in 16 (64%) cases, Good result in 7 (28%) cases as there was some pin tract infection and restriction of movement. Poor result was in 2 (8%) cases.

Discussion

Supracondylar fracture of the humerus is very common. Majority can usually be managed by closed reduction and immobilization with plaster. Gartland type III Supracondylar fracture is very difficult to manage by close manipulation, which can be managed well by surgery.

In the present study, we found supracondylar fracture more common among the male children (76%), and right sided involvement (60%) were more commom than that of the left. This is probably due to more extroverted activities of the male children having dominant right hand. Operative delay (3 to 7 days) after the day of admission or infliction of the injuries were due to huge swelling of the affected limbs, managed by Dunlop traction and active exercise in elevated position. Excellent result was noticed in 16 (64%) cases, among those who were compliant, underwent surgery earlier, were followed up regularly and whose swelling were minimum. Poor result was found in 2 (8%), one of which was due to severely restricted joint movements, possibly due to inadequate physiotherapy. The other one was due to high radial nerve palsy. Minor pin tract infection and mild restriction of joint movement were found in 7 (28%) cases, categorized as good.

From the above study, it can be inferred that type III supracondylar fracture of the humerus, which is difficult to reduce by close manipulation, can be safely managed by open reduction and percutaneous K-wire fixation, giving better result. Further study involving large number of patients with long-term follow up will be helpful to asses the outcome of surgery.

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ORIGINAL ARTICLE

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Postmortem Outcome of Organophosphorus Poisoning Cases at Dinajpur Medical College, Dinajpur

* MD. RAFIQUL ISLAM[a], ASHARAFUL ALAM[b], AA ADILUZZAMAN[c], M SAIFUL BARI[d]

Abstract

Postmortem study was carried out among victims of OPC (organophosphorus compound) poisoning cases at Dinajpur Medical College (DinMC), Dinajpur morgue from January 2001 to December 2003. Data were collected from postmortem records of the department of Forensic Medicine, DinMC. Out of 706 autopsy cases, 122 were identified as cases of OPC poisoning and analyzed. There was slight chronological decrease in the prevalence of OPC poisoning cases. The main reason of taking OPC poison was found to commit suicide. Every year one million people commit suicide mainly taking OPC poison. It is due to poverty, financial hardship, losses of dearly persons, frustrations in life, job dissatisfaction and prevalence of dowry system in the society. Incidences are more common in females than males usually in the 2nd and 3rd decades of life.

[OMTAJ 2004; 3(1): 13-15]

Introduction

Our country is a land of agriculture. Much of the success in the agricultural fields in our country is due to the knowledge and use of agricultural insecticides. There are other uses of these insecticidal agents e.g., domestic and commercial uses. Some of the insecticides are deadly toxic to human beings as they are also most effective as insecticidal agents. Hence these preparations are most popular on one side and on other side take many lives every year, though mostly in the rural areas but also to a considerable extent in the urban areas.[1]

[a] Assistant Professor and Head
Department of Forensic Medicine
Dinajpur Medical College, Dinajpur.

[b] Professor and Head
Department of Forensic Medicine
Rajshahi Medical College, Rajshahi

[c] Assistant Professor and Head
Department of Forensic Medicine
Sylhet MAG Osmani Medical College

[d] Professor, Department of Cardiology and Principal
Dinajpur Medical College, Dinajpur.

* Corresponding author

Routes of OPC poisoning include absorbtion by inhalation, through the mucus membrane, skin and gastrointestinal tract.[2]

When one takes organophosphorous compound (OPC) poison to commit suicide, it is said to be a case of suicidal poisoning. It is a social crime and is a problem to the affluent society. Being easily available, it is the commonest method of suicide. It is a manifestation of social agitation and causes of which should be identified and eradicated.

In Sri Lanka alone, 16,000 admissions to hospital and more than thousand deaths occur each year from agrochemicals. Many of these are suicides but a large number are accidental.[3]

OPC poisoning is detrimental to social health and its incidence should be reduced to a remarkable extent to attain a healthy society. The root cause leading to such incidence should be eradicated as far as possible.

Workers engaged in the spraying of OPC in the fields, packers and manufactures are at special risk of accidental poisoning.[4]

To commit suicide, females being predisposed than male, hence major causes being property, familial problem like physical assault by husband, loss of dearly persons leading to frustrations, mental depression which should be sought out and socially dealt with. Thus we can attain the goal of a nice society.

Methods

It is a retrospective study of the cases of suicidal poisoning by OPC. The data was collected from inquest reports, chalans, and postmortem reports from the Forensic Medicine department of Dinajpur Medical College, Dinajpur, during the period of January 2001 to December 2003, volume numbers 1-8, and also from chemical analysis reports of the preserved viscerae from chief chemical examiners office Mohakhali, Dhaka. The viserae preserved for chemical analysis were: stomach with its contents and proximal 50 cm of small intestine, portion of liver (500gm), and half of each kidney. Preservative used was rectified spirit. With all precautions

Results

Total number of autopsies performed from January 2001 to December 2003, were 706, out of which 121 were detected to be cases of OPC poisoning and 99% of them were suicidal. (Table I)

There was slight year-wise decrease in the prevalence of OPC poisoning, mainly suicidal. (Table II, III) The maximum cases being committed in the 2nd and 3rd decades of life. The OPC poisoning was found to occur more in females than males and it constituted 17.14% of total OPC poisoning cases. (Table III) It was difficult to analyze occupation due to frequent omission in the inquest report. However, housewife constituted more amongst those whose records were available.

Table I: Year- and sex-wise OPC poisoning cases at autopsy in the morgue of Dinajpur Medical Collage, Dinajpur

Year	Total number of autopsy cases	Number (%) of OPC poisoning		
		Total	Male	Female
2001	267	44 (16.47)	12 (27.27)	32 (72.73)
2002	227	39 (17.18)	20 (51.28)	19 (48.72)
2003	212	38 (17.92)	18 (47.37)	20 (52.63)
Total	706	121 (17.14)	50 (41.32)	71 (58.68)

Table II: Thana-wise cases of OPC poisoning

Sl. No.	Police station	Number of in cases 2001	Number of in cases 2002	Number of in cases 2003
1	Kotwali	10	10	16
2	Parbatipur	06	04	02
3	Chirbandar	02	05	02
4	Birol	01	01	01
5	Bochagong	01	01	02
6	Kaharol	02	02	00
7	Birgang	07	04	06
8	Khansama	03	00	00
9	Phulbari	04	03	03
10	Birampur	03	04	02
11	Ghraghat	01	03	02
12	Hakimpur	02	00	00
13	Nawabgong	02	02	01
	Total	44	39	3

Table III: Age- and sex-wise distribution of the poisoning cases

Age	2001		2002		2003	
	Male	Female	Male	Female	Male	Female
<15 yrs	00	02	00	01	01	01
15.1-18 yrs	01	05	04	00	02	03
18.1-40 yrs	10	23	16	18	12	16
>40 yrs	01	02	00	00	03	00
Total	12	32	20	14	18	20

During autopsies of OPC poisoning, some concomitant external injuries were found on the body of the victims in a few cases which constituted 6%. But these injuries did not result in death of the victims. Their presence indicates that the victim was subjected to physical assault which could be the trigger for mental depression and led to OPC poisoning for suicide.

Discussion

Among the different modes of suicide in Bangladesh, OPC poisoning is the commonest.

Owing to the lack of training and experience, the investigation officer usually fails to prepare the inquest report properly and completely. So these deficiencies lead to difficulty in collection of accurate statistical data such as failure to mention the occupation of the victim and cause of poisoning.

The commonest motive for taking OPC is frustration and mental depression and due to physical torture by hushand.[5]

The OPC poisoning cases reflects the picture of our social status and social health. Collection, preservation and sending the viscera accurately and timely to chemical examiner's office is very important. If we get the chemical examiner's report timely, the relatives of the victim can get the justice. The investigation officer, preparing the inquest report, should be given specialized medico-legal training. The medical personnel concerned with performing the autopsy should have adequate experience in field of Forensic Science, otherwise there might be unintentional errors in the post mortem report. These errors may be minimized by giving a short course specialized training in the subject.

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Isolation, Identification and Antibiogram of the Uropathogens Isolated in Sylhet MAG Osmani Medical College

* MD. ASHRAFUL ALAM[a], OSUL AHMED CHOWSHURY[b], MD. MOSHARAF HOSSAIN[c], NURUN NAHAR[d]

Abstract

This was a retrospective study to see the pathogens of urinary tract infection (UTI) among the suspected cases, and antimicrobial susceptibility pattern of the isolated organisms. The period taken into consideration was from January 2001 to December 2003. The data, as has been recorded in the department, were analysed for the purpose of the study. Total entry of the specimens of urine for culture and sensitivity from suspected cases of UTI was 173. Patients of all age group from 03 to 95 years had been investigated with a male: female ratio of about 1: 1.88. Rate of infection was found more among the females (25%). A total of 34 (20.0%) specimens yielded growth of which almost all (32, 94.12%) were *Escherichia coli*, All (100%) of the *E. coli* isolates were resistant to Ampicillin/ Amoxycillin, almost all (90.32%) to Co-trimoxazole, and majority (75.0% each) to Cephalexin and Nalidixic acid. All of them (100%) were sensitive to Nitrofurantoin, majority (82.76%) to Gentamycin and a good number (51.61%) to Ciprofloxacin.

[OMTAJ 2004; 3(1): 16-18]

Introduction

Urinary tract infection (UTI) is a common medical problem encountered during the clinical practice. Almost all age ranges of the population including both sexes may become infected with the uropathogens. Infections at various anatomical sites of the urinary tract may occur together or independently or present as clinical syndromes. Two general anatomic categories of acute infections have been defined: lower tract infections include urethritis, cystitis, and prostatitis and upper tract infections include pyelonephritis, intrarenal and perinephric abscesses.[1] Infections of urethra and bladder are often considered superficial (or mucosal) infections, while prostatitis, pyelonephritis and suppuration signify tissue invasion. Some authors define urinary tract infection as presence or invasion of microorganism and multiplication into a previously sterile urinary system.[2]

Microbiologically, urinary tract infection exists when pathogenic microorganisms are detected in urine, urethra, bladder, kidney or prostate. Usually growth of more than 10^5 organisms per mililiter (ml) from a properly collected midstream clean catch urine sample indicates infection.[3,4] However, some cases of urinary infections without significant bacteriuria may be present. In patients having symptoms, a smaller number of bacteria (10^3-10^4 per ml of midrstream urine) may accompany infection. In urine specimens obtained by suprapubic aspiration or in and out of catheterization, or from patients with indwelling catheter colony counts of 10^2 to 10^4 per ml generally indicate infection. Conversely, colony counts in excess of 10^5 per ml of midstream urine are occasionally due to specimen contamination, especially when multiple species are present.[1]

Epidemiologically urinary tract infections are subdivided into catheter-associated (or nosocomial) or non-catheter-associated (or community-acquired) infections. Acute infections in non-catheterized patients are very common, especially in women, which occur in 1-3% of school girls and then increase markedly in incidence with onset of sexual activity in the adolescents in the developed countries. The vast majority of acute symptomatic infections occur in young women. Acute symptomatic urinary infections are unusual in men under the age of 50. The occurrence of asymptomatic bacteriuria parallels that of symptomatic infection and is rare in men below 50 but is common in women between

[a,c] Assistant Professors,

[b] Associate Professor,

[d] Professor and Head,

Department of Microbiology,
Sylhet MAG Osmani Medical College

* Corresponding author

ages 20 to 50. About 20% women in the age range of 20-65 years suffer at least one attack per year and 50% of them develop UTI within their lifetime.[5,6] Asymptomatic bacteriuria is very common in elderly men and women, being studied in up to 40-50% patients in some studies.

Many different microorganisms can infect the urinary tract but by far the most common agents are Gram-negative bacilli *Escherichia coli* causes approximately 80% of acute infections in patients without catheters, urological abnormalities or calculi. Other Gram-negative rods, especially *Proteus* and *Klebsiella* and occasionally Enterobacter account for a smaller proportion of uncomplicated infections.[1] In Bangladesh, in a study by Shamima Karim and her colleagues in a tertiary care hospital found *E. coli* as the most common uropathogen (49.1%) followed by *Klebsiella* species (13.4%).[7]

In Bangladesh, uropathogens were found mostly resistant to many commonly used antibiotics.[8,9] The present study was, therefore, designed to explore the prevalence of uropathogens in the area of Sylhet and to see the antimicrobial susceptibility pattern of these isolates.

Methods

Study type and period: Retrospective. Data have been collected from the departmental records from January 2001 to December 2003.

Study population: A total of 173 patients, irrespective of age and sex, whether admitted into hospital or attending OPDs, suspected of having urinary tract infection was included in the study.

Specimen collection: Urine. The patients on attending the department, were briefed about aseptic collection of the urine specimens. Patients were advised to collect the midstream urine of early morning sample and to submit it to the department.

Inoculation and Incubation: Submitted specimens were inoculated immediately onto prewarmed McConkey and Blood agar media with the help of a calibrated loop (to inoculate about 2 microlitre). Inoculated media plates were incubated at 37^0C aerobically for the next 24-48 hours.

Growth observation and pathogen identification: After overnight incubation, plates were examined for any growth. When growth was present, colonies were identified as uropathogen according to standard protocol.[10] Specimens showing $\geq 10^5$ colony forming units/ ml were considered as infected.

Antimicrobial susceptibility test: Identified pathogens were then subjected to antimicrobial susceptibility to available antimicrobial agents following standard protocol by Kirby-Bauer disk diffusion method.[11] Inhibitory zone diameters were recorded on the following day to calculate susceptibility pattern.

Results

Among the 173 patients considered, urine specimen of 34 (19.08%) showed growth of uropathogens. Majority of the cases (113, 65.32%) were female and rate of isolation of pathogens was also higher (20.35%) among these population. (Table I) Ages of the patients included were from 03 to 95 years. The highest enrollment (27.78%) was from 21-30 years age group, and there was no significant variation in infectivity rate. (Table II)

Table I: Relation of gender with infection of the cases (n=173)

Sl no	Gender	No (%) of cases	
		Enrolled	Organism isolated
01	Male	60 (34.68)	09 (15.0)
02	Female	113 (65.32)	23 (20.35)

Table II: Relation of age groups with infection of the cases (n=162)

Sl no	Age group	No (%) of cases	
		Enrolled	Organism isolated
01	Up to 10 years	16 (09.87)	03 (18.75)
02	11-20 years	19 (11.73)	05 (26.32)
03	21-30 years	45 (27.78)	08 (17.78)
04	31-40 years	38 (23.46)	08 (21.05)
05	41-50 years	21 (12.96)	02 (09.52)
06	51-60 years	13 (08.02)	03(23.08)
07	61-70 years	09 (5.56)	03 (33.33)
08	$\geq$ 71 years	01 (0.62)	01 (100.0)
	Total	162 (100.0)	33 (20.37)

Among the 34 specimens showing growth, 32 (94.12%) were *Escherichia coli* and other two were *Klebsiella* and *Staphylococcus saprophyticus*. Antimicrobial sensitivity of the *E. coli* shows all of them are (31/31, 100.0%) resistant to amoxicillin, most of them (28/31, 90.32%) resistant to cotrimoxazole, and majority resistant to nalidixic acid and cephalexin (75.0% each). All of the *E. coli* isolates (28/28, 100.0%) were found sensitive to nitrofurantoin, and most of them (24/29, 82.76%) were sensitive to gentamycin. (Table III)

Table III: Sensitivity pattern of the isolated *E. coli* (n=32)

Sl no	Antibiotic	No (%) of the isolates distributed into susceptibility groups of the antibiotics		
		Resistant	Intermediate	Sensitive
01	Amoxicllin (n= 31)	31 (100.0)	00 (00)	00(00)
02	Cotrimoxazole (n=31)	28 (90.32)	00 (00)	03 (9.68)
03	Nalidixic acid (n=28)	21 (75.0)	00 (00)	07 (25.0)
04	Ciprofloxacin (n=31)	14 (45.16)	01 (3.23)	16 (51.61)
05	Cephalexin (n=28)	21 (75.0)	00 (00)	07 (25.0)
06	Gentamycin (n=29)	05 (17.24)	00 (00)	24 (82.76)
07	Nitrofurantoin (n=28)	00 (000	00 (00)	28 (100.0)

Discussion

Urinary tract infection is a very common clinical condition found in all age groups having specific morbidity. Organisms causing urinary tract infection are becoming resistant to multiple antibiotics in the recent studies.

The sensitivity pattern found in the present study is almost similar to the previous studies.[7,8] But in case of fluoroquinolones (ciprofloxacin) the picture depicted in this study differs with few previous studies.

This study revealed a very narrow range of isolates as well as the sample size. The sample size is also very insignificant which actually can not reflect a community picture of pathogen prevalence or susceptibility pattern of the pathogens. A multicenter surveillance with wider range of isolates is recommended to conclude about the uropathogens prevalence and their susceptibility in our community.

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