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Post-Operative Operations Wound Infection Rate for Biliary Tract Disease, Gastrointestinal Tract Disease and Other Intrabdominal Diseases

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Abstract **Original Research Article**

Introduction: Contamination is inevitable especially in operations upon the patients with rupture or perforation of gastrointestinal tract as there is gross spillage. Contamination is also common in conditions with continuous drainage of faucal, tracheobronchial or genitourinary discharge or actual drainage of purulent materials. Contamination may also result from poor surgical technique. Postoperative wound infection results from bacterial contamination during or after the surgical procedure. ***Objective:*** The main objective of this research is to make a comparative study on factors contributing wound infection post-operative wound infection between first and subsequent cases in routine surgical procedure. ***Method:*** In this study 228 cases have been studied. The samples were divided into 3 cases for the purpose of this study.All cases belong to the surgical unit I of Mymensingh Medical College Hospital. Operation days were selected at random. The study duration was from September 2015 to August 2016. ***Result:*** It is clearly showed that host factors like Malnutrition, Obesity, Obstructive Jaundice, Malignancy render the wound prone to infection due to lower host resistance and impaired wound healing process, so adequate preoperative assessment and preparation of the patient is essential to minimize wound infection. Again, proper operation site skin preparation, personal cleanliness, gentle handling of tissue, proper haemostasis, all contribute to reduce wound infection. ***Conclusion:*** The study concludes that wound healing is a local phenomenon; care of the wounds is essentially the care of the patients.

Keywords: Skin Trauma, Micro-Organisms, Wound Infection.

INTRODUCTION

Contamination is inevitable especially in operations upon the patients with rupture or perforation of gastrointestinal tract as there is gross spillage. Contamination is also common in conditions with continuous drainage of faucal, tracheobronchial or genitourinary discharge or actual drainage of purulent materials. Contamination may also result from poor surgical technique. Postoperative wound infection results from bacterial contamination during or after the surgical procedure. The infection usually involves the subcutaneous tissue. The clinical manifestation depends on the amount of contamination, if contamination is minimum, and there is no injury and without anyinjury and without any dead spaces, infection rarely occurs [1].

The rate is higher for those types of operation, which indicates poor asepsis, faulty operative technique etc. Severely contaminated wounds such as in operation on the unprepared colon or emergency operation for internal bleeding or perforation may have an infection risk of 15-30% [2].

Unnecessary trauma from retractors, inappropriate use of electrocoagulation, gross ligation of bleeding points, foreign bodies and dead space contribute a vital role in postoperative wound infection.

Since even a minor postoperative wound infection prolongs hospitalization and causes economic loss, every effort must be made to keep the infection rate low [3].

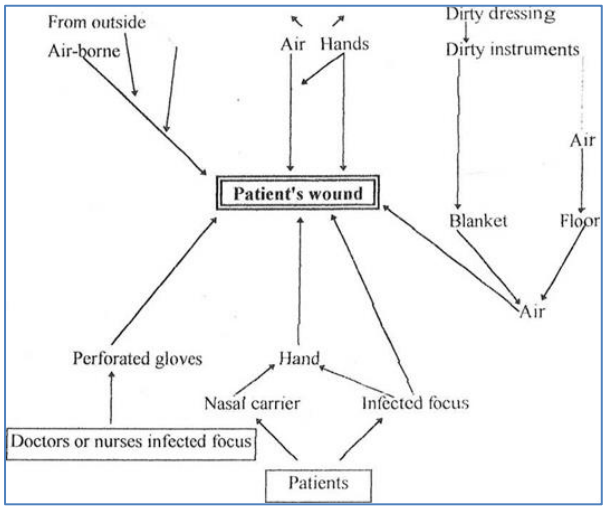

Fig-1: Patients Wound and Pre-operative Preparation

Hospital infection is the result of the transmission of pathogenic organism to a previously uninfected patient from a source of environment of the hospital. There is progressive accumulation of pathogenic organism in an ill ventilated operation theatre. The sources are patients, attendants and spectators. Movements of spectator's cause movement of settled organisms to rise in the air which might facilitate in setting down the organism in operation wound. Most of the organisms are resistant to commonly used antibiotics. This statement is true with staphylococci and gram negative intestinal bacilli- Constant uses of antibiotics over the years cause most of the sensitive strains to eliminate leaving the resistant variety behind. Once the resistant population has developed it is perpetuated by infecting new victims [4].

OBJECTIVES

Main Objective

The main objective of this research is to make a comparative study onfactors contributing wound infection post-operative wound infection between first and subsequent cases in routine surgical procedure.

Specific Objectives

The specific objectives of the study are

- To identify the various factors especially environment of the operation theatre in our situation.
- To determine the factors contributing wound infection following planned operation. There by reduction of post-operative infection by taking appropriate measure against causative factors/agents.

METHOD

In this study 228 cases have been studied. The samples were divided into 3 cases for the purpose of this study. Here,

- 76 were the 1st case,
- 76 were 2nd case, and
- 76 were the 3rd case in routine operation days.

Inclusion criteria of the study

All the patients included in this study were admitted for elective surgery for

- biliary tract disease,
- gastrointestinal tract disease and
- otherintrabdominal diseases.

Exclusion criteria of the study

The patients that were elected for any other surgery that were more critical or complex than the routine surgeries were excluded from the study.

Study Area

All cases belong to the surgical unit I of Mymensingh Medical College Hospital. Operation days were selected at random.

Study Procedure

Pre-operative preparation

All routine and diagnostic investigation was done. Particular attention was paid to diabetic status; drug used especially steroids and any immunosuppressive drugs and presence of concurrent disease. Patients were examined carefully with particular attention to the vital parameters, general physical build, nutritional status, anaemia, jaundice and any septic focus. Patients were given necessary treatment where indicated.

Skin Preparation

The day before the operation patients took bath using toilet soap. In the operation theatre, after anesthesia skin was cleaned with-

- Povidone iodine USP 5% w/w
- Spirit (70% methylated spirit in water)
- Chlorhexidine

RESULTS

The details of the incision and infection per cases (33.33% for each) in the overall sample are shown in Table 1.

Table-1: Character of Incision and Infection

Incision	No	of incisions		No.	of infection		% of infection		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Kocher's	41	32	17	1	1	1	2.44	3.13	5.88
Upper Paramedian (Rt)	2	9	14	0	1	1	0	11.11	7.14
Upper Mid line	1	7	9	0	0	1	0	0	11.11
Lanz	O	2	3	0	0	0	0	0	0
Rt. lower paramedian	1	2	2	0	0	0	0	0	0
Inguinal	6	8	5	0	0	0	0	0	0
Rt. Lumbar incision	8	6	13	1	0	0	12	0	0
Lt. lumbar incision	2	0	4	0	0	0	0	0	0
Pfannenstiel	1	7	6	0	1	1	o 1	14.29	16.66

Table 2 describes the duration of operation and wound infection rate per each cases of sample. Infection rate varies not only with the sequence of operation in a routine operation day, but also with the duration of operation. Upto 1 hour it was 1.72% in 1st case, 1.92% in 2nd case & 1.92% in 3rd case and for >1 hour it was 5.56% in 1st case, 8.33% in 2nd case & 12.50% in 3rd cases in this series.

Table-2: Host Conditions (Duration of Operation) and Wound Infection Rate

Duration of operation	No. of cases			No. of infection			% of wound infection		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
0-1 hr.	58	52	52	1	1	15	1.72	1.92	1.92
>1 hrs.	18	24	24	1	2	*n*	5.56	8.33	12.50 1

Wound infection rate also varies with the conditions of the host. As we see in series that - In Malnutrition wound infection rate was 2.63 in 1st case, 2.56 in 2nd case, and 4.55 in 3rd case. In obesity 0% in 1st case, 5% in 2nd case & 0% in 3rd case in Diabetes Mellitus, 16.67% in 1st case, 0% in 2nd case, 11.11% in 3rd case, in Obstructive jaundice. 0% in 1st case, 14.28% in 2nd case, 0% in 3rd case, in Malignancy, 0% in 1st case.0% in 2nd case & 10% in 3rd case (Table 3).

Table-3: Host Conditions (Physical) and Wound Infection Rate

Host conditions	No. Cases			No. of infection			% of infection		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Malnutrition	38	39	44	1	1	2	2.63	2.56	4.55
Obesity	26	20	10	0	1	0	0	5.00	0
Diabetes Mellitus	6	4	9	1	0	1	16.67	0	11.1 1
Obstructive Jaundice	0	7	3	0	1	0	0	14.28	0
Malignancy	*6*	6	10	0	0	1	0	0	10.00

In this series the rate of infection in clean wound in 1st case was 1.72%. 2nd case, .1.92%, 3rd case was 2% and in clean contaminated wound was 5.56% in 1st case, 8.33% in 2nd case & 11.54% in 3rd case (Table 4).

Table-4: Host Conditions (Environmental Factors) and Wound Infection Rate

	Types of wounds	No. of Cases			No.	of infection		% of infection		
		1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Present series	Clean	58	52	50	1	1	1	1.72	1.92	2.00
	CleanContaminated	18	24	26	1	2	3	5.56	8.33	11.54
	Contaminated	0	0	0	0	0	0	0	0	0

Table 5 describes the analysis of infection rate related to wound types per each of the subsequent cases.

Table-5: Infection Rate Related to Wound Types

A 10 year prospective	Total Number	No. of Infection		%
study of 62,939 Wounds	Clean	47,054	732	1.5
by Peter J. E. Cruse &	Clean contaminated.	9,370	720	7.7
Rosemary Frood, R.N.	Contaminated	442	676	15.2
(The Surgical Clinicsof North America, February1980) Surgical Infection	Dirty	2,093	832	40.0
	Overall	62,939	2,96	4.7
Present series	Clean	160	3	1.88
	Clean contaminated	68	6	8.82
	Overall	228	9	3.95

DISCUSSION

Post-operative wound infection is still one of the major problems in the hospitals of our country and also continues to be a source of morbidity in the surgical patients. There are few reports on nosocomial infection in our country'. There are some study reports on post-operative wound infection [5-8].

There is a relation between the length of operating time and infection rate. In this series (table-10) the rate of wound infection was about three times more when the duration was two times more; it also varies with the sequence of cases. In 1st case, infection rate was more than the 3rd case.

Other studies also shown a rise in infection rate associated with prolongation of the operating time [9]. There are four possible explanations-

- Dosage of the bacterial contamination increases with the time.
- Wounded tissues are damaged by drying and by exposure to air and retraction.
- Increased amount of suture and electrocoagulation may reduce the local resistance of the wound.
- Longer procedures are more liable to be associated with blood loss and shock, thereby reducing the general resistance of the patients.

Again, this study shows that when the wounds were clean peroperatively, infection rate was low. But when there was peroperative contamination, the rate of infection were higher as compared with the following studies-

A 10 year prospective study of 62,939 wounds by cruse PJE and firood R - the wound infection rate in clean wounds 1.5%, clean contaminated wounds 7.7%, contaminated wounds 15.2%, dirty wound 40%[9].

In this series, (Table-6) wound infection rate increases with clinically malnourished to 2.63% in 1st case, 2.56% in 2nd case, 4.55% in 3rd case, Obesity to 5% in 2nd case, Diabetes mellitus 16.67% in 1st case, 11.11% in 3rd case. Obstructive Jaundice to 14.28% in 2nd case, Malignancy to 10% in 3rd case.

In this series, it is clearly showed that host factors like Malnutrition, Obesity, Obstructive Jaundice, Malignancy render the wound prone to infection due to lower host resistance and impaired wound healing process, so adequate preoperative assessment and preparation of the patient is essential to minimize wound infection.

Again, proper operation site skin preparation, personal cleanliness, gentle handling of tissue, proper haemostasis, all contribute to reduce wound infection. Nature of incision, its length and operation time all influence the wound infection rate.

CONCLUSION

The quality of surgical care is often correlated with the post-operative wound infection rate in a hospital. The ideal care of the wound begins from the admission and includes immediate assessment and resuscitative measures, preparation of the patient at optimal conditions when the wound is made and an aseptic environment are important for control of infection rates.

In contrast to the highly advanced surgical amenities, preoperative resuscitative units, modern operation theatre facilities and very sophisticated sterilization procedure of developed countries, we have poor general health status, very poor aseptic environment and miserable surgical amenities but the incidence of wound inflection is not so high.

If we had a well-equipped, surgical ward with clean environment, adequate resuscitative facilities, a planned operation theatre, isolation facilities for septic patients and overall consciousness of the patient regarding health, the incidence of post-operative wound infection is bound to come down and routine use of antibiotics can be avoided. Wound healing is a local phenomenon; care of the wounds is essentially the care of the patients.

REFERENCE

1. Russel RCG, Williams NS: Bulstrode C. J. K. Bailey and loves, Short Practices of Surgery 23rd ed. Arnold, London. 2000; 29-39, 87-98.

2. Dudley HAF: Hamilton Baily's Emergency Surgery, 11th ed. J. Wright and sons' ltd. Bristol. 1985;259-270.
3. Me Minn RMH. Last's Anatomy, Regional and Applied, 9th ed. Churchill- Livingstone. Edinburgh. 1994; 241,295-299.
4. Rintoul RF. Farquharson's Textbook of Operative Surgery, 8th ed. Churchill-Livingstone. Edinburgh. 1995; 2-6, 337-352.
5. Ali SL and Khan ANGA. Pattern of Surgical infection at Chittagong Medical College Hospital, Journal of BCPS. 1983; 1:1: 17-20.
6. Noel-1, Hollyoak-V, Galloway – A. A Survey of the incidence and care of post-operative wound infections in the community; J- Hosp- Infect. 1997 Aug; 36 (4): 267-73.
7. Eltahawy- AT, Mokhtar – AA, Khalaf- RM, Bahnassy-AA. Post-operative wound infection at a University hospital in Jeddah, Saudi Arabia; J-Hosp- Infect. 1992 May; 21(1): 79-8.3.
8. Nichols – RL. Surgical wound infection. Am - J - Med. 1991 Sep. 16; 91 (3b) 54S-64S.
9. Cruse PJE, Frood R. The epidemiology of wound infection, surgical clinics of North America. 1980; 60:1:27- 40.