

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Evaluation Of The Risk Factors Of Wound Dehiscence After Emergency Exploratory Laparotomy In Tertiary Care Center.

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ABSTRACT

Compared with other acute surgical emergencies, patients undergoing emergency laparotomy have a disproportionately higher mortality both in younger as well as in an older sick patients. This was an observational and prospective study. The study was conducted for a period of 18 months. The study was conducted among patient undergoing emergency exploratory laparotomy. Sample size was determined by Complete Enumeration method. All the cases available during the study period is considered and studied with consideration of exclusion and inclusion criteria, All the relevant information was recorded in case record form(CRF). Thus total 80 cases were studied. On Association between comorbidity and post operative day. Applying chi square test, $p = 0.12$, as p is > 0.05 shows no statistical significance. On risk factors associated with early postoperative wound dehiscence, statistical significance was seen for smoking and alcoholism. Wound dehiscence is a serious complication that has a low incidence but considerable morbidity. It lengthens hospital stays and raises treatment expenses. Evidence on predictive variables for abdominal wound dehiscence in patients following emergency laparotomy is lacking in the literature. This research contributes fresh information on the risk factors for wound dehiscence following emergency laparotomy. After emergency laparotomy, we found smoking, alcohol as independent risk factors for abdominal wound dehiscence. Preoperatively identifying these danger signs and adopting the required safety measures should help avoid this difficult post- emergency laparotomy consequence.

Keywords: Wound dehiscence, surgical emergency, laparotomy

<https://doi.org/10.33887/rjpbcs/2023.14.2.16>

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INTRODUCTION

Compared with other acute surgical emergencies, patients undergoing emergency laparotomy have a disproportionately higher mortality both in younger [1-5] as well as in an older sick patient [6]. Emergency laparotomy is a resource intensive surgical procedure with a high morbidity and mortality rates even in the best healthcare systems and remain an area of focus for quality improvement [7-9]. Perioperative management of patients undergoing emergency laparotomy with middle and low-income is extremely challenging, and causes high postoperative 30-day patient morbidity and mortality as well as imposes a high healthcare cost burden [10]. In addition, in developing countries, like India there are large volumes of emergency patients who need surgical care and patient to surgeon ratio is also very less.

Despite constantly improved knowledge of the physiology of wound healing process, as well as the advances in surgical technique and application of modern technologies and materials in surgery, wound healing problem remains to be, and the immediate complications such as wound dehiscence continue to occur despite all the precautions taken. Surgical wound of the abdominal wall is artificially-made cut through all the layers of the anterior abdominal wall (skin, subcutaneous tissue, fascia, muscles and peritoneum). This incision initiates a cascade of mechanisms at the cellular level, which are aimed at healing at the site of incision. Healing can take place as primary type (per primam-adequately surgically reconstructed wounds) or secondary type (per secundam-wound with divided edges for any reason). Secondary healing occurs whenever there is an extensive loss of cells and tissue in the projection section, inflammatory processes, abscesses formed, and the like. Both processes take place cascading through three stages: exudative phase, proliferation phase, and phase of reparations. Frequency of wound dehiscence in the relevant literature cited in the range of 0.2% to 6% [2], with a mortality ranges from 9 to 50% [3]. Factors affecting the abdominal wall wound healing are numerous and relating to the characteristics of the patient, its co morbidities, type of pathology and method of surgical treatment. Several retrospective studies have examined the problem of identifying risk factors for this complication, but with discordant results.

MATERIAL AND METHODOLOGY

This was an observational and prospective study. The study was conducted for a period of 18 months. The study was conducted among patient undergoing emergency exploratory laparotomy. Sample size was determined by Complete Enumeration method. All the cases available during the study period is considered and studied with consideration of exclusion and inclusion criteria, All the relevant information was recorded in case record form (CRF). Thus total 80 cases were studied.

Inclusion Criteria

The patients who show clinically verified signs of the operative wound dehiscence After Emergency Exploratory Laparotomy.

Patients who have given valid written informed consent.

Exclusion Criteria

Patients whose record was not available.

Patients who were lost to follow up the initial Procedure.

RESULTS

Majority 47.5% were in age group of 30 to 60 years, 28.8% in 10 to 30 years, 18.8% >60 years and 5% had age <10 years. Mean age was 40.3 \pm 19 years, ranging between 1.5 to 72 years. Majority 67.5% were males and 32.5% were females.

On co morbidity, majority 20% had HTN, 13.8% had DM, 3.8% had bronchial asthma. Most common diagnosis was peritoneal perforation 37.5% followed by SAIO 27.5% and least were intussusception 1.3%.

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Majority 77.5% had dehiscence on 5 to 10 post operative day. Mean post operative day 7.4 ± 1.7 , ranging 4 to 12 day.

Table 1: Post operative complications

Post-operative complication	Frequency	Percentage
Cough	18	22.5
EC fistula	8	10.0
No complication	54	67.5
Total	80	100

Other most common complication noted was 22.5% cough and 10% EC fistula

Table 2: Laboratory investigation

Parameter	Mean	SD
RBS	136.2	59.6
Hb	10	1.4
TLC	14.1	2.17
Creatinine	1.2	0.49
Proteins	5.7	0.59

On laboratory investigations, mean RBS was 136.2, HB was 10, TLC was 14.1, creatininewas 1.2 and proteins was 5.7

Table 3: Association between comorbidity and post operative day

Co morbidity	Post operative day			Total
	<5	5to 10	>10	
HTN	4	11	1	16
DM	2	8	1	11
Bronchial asthma	0	3	0	3
Cancer	0	0	2	2
COPD	1	1	0	2
HBSAG positive	0	1	0	1
Hypothyroidism	0	2	0	2
Tuberculosis	1	2	1	4

Applying chi square test, $p = 0.12$, as p is > 0.05 shows no statistical significance.

Table 4: Distribution on risk factors associated with early postoperative wound dehiscence.

Parameters	Post operative day		P value
	<5	>5	
Mean Age in years	49.07±12.1	38.6±19.6	0.06
Gender			
Male	11	43	0.07
Female	2	24	
Mean BMI	23.7±3.2	23.5±2.8	0.8
Addiction			
Smoking	9	28	0.03*
Alcohol	9	27	0.02*
Diagnosis			
Acute Appendicitis	1	4	0.4
Abdominal trauma	0	2	0.2
Append. Perforation	1	11	0.2
Intussusception	0	1	0.3
Perforation Peritonitis	6	24	0.2
Ruptured liver abscess	0	1	0.3

DISCUSSION

On risk factors associated with early postoperative wound dehiscence, statistical significance was seen for smoking and alcoholism. On addiction 46.3% were smokers and 45% were alcoholic. Study by Serdar Kalemci et al [10] showed that 37.9% were smokers. Study by Hegazy, Tarek O et al ¹¹ showed that 41.9% were smokers.

On co morbidity, majority 20% had HTN, 13.8% had DM, 3.8% had bronchial asthma. Study by Aksamija G et al showed that 14% had DM, 73% had HTN. Study by Serdar Kalemci et al [10] showed that 20.6% had HTN, 17.9% had DM, 14.3% had COPD. Study by Hegazy, Tarek O et al ¹¹ showed that 41.9% had DM, 16.1% had HTN, 6.5% had bronchial asthma.

Most common diagnosis was peritoneal perforation 37.5% followed by SAIO 27.5% and least were intussusception 1.3%. Study by Aksamija G et al showed that 40.1% had cancer, 29.5% had acute abdomen, 11% had ileus, 25 had ulcerative colitis, etc. Study by Verma S et al showed that 30(60%) patients had peritonitis due to hollow viscus perforation secondary to duodenal ulcer, gastric or small bowel perforation, 6(12%) patients had complicated appendicitis, 5(10%) patients had pyoperitonium, 4(8%) patients were diagnosed with intestinal obstruction.

On Association between comorbidity and post operative day. Applying chi square test, p =0.12, as p is >0.05 shows no statistical significance.

On risk factors associated with early postoperative wound dehiscence, statistical significance was seen for smoking and alcoholism.

Study by Aksamija G et al [12] showed that frequency in the sample was not statistically significantly different compared to the comorbid conditions. Study by Serdar Kalemci et al [13] showed

that patients in the wound dehiscence group had higher mean BMI (27.8 vs. 26.3 kg/m², p=0.006) and ASA score (p=0.002). History of COPD (30.2 vs. 14.3%, p=0.006), DM (44.2 vs. 17.9%, p=0.003), previous abdominal surgery (18.6 vs. 7.7%, p=0.014), and POI (58.1 vs. 16.9%, p=0.006) were also higher in this group. There was no difference between the two groups in terms of the history of HT, duration of operation, type of urinary diversion, and status of smoking. In the multivariable regression model, DM (OR 4.9, 95%CI 2.3– 10.1; p <0.01).

CONCLUSION

Wound dehiscence is a serious complication that has a low incidence but considerable morbidity. It lengthens hospital stays and raises treatment expenses. Evidence on predictive variables for abdominal wound dehiscence in patients following emergency laparotomy is lacking in the literature. This research contributes fresh information on the risk factors for wound dehiscence following emergency laparotomy. After emergency laparotomy, we found smoking, alcohol as independent risk factors for abdominal wound dehiscence. Preoperatively identifying these danger signs and adopting the required safety measures should help avoid this difficult post- emergency laparotomy consequence.

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