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Original research article

A clinical investigation into the incidence of postoperative sepsis following emergency abdominal surgeries

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Abstract

Background and Objective: To ascertain the incidence of postoperative sepsis following emergency abdominal surgeries, the various risk factors during the preoperative, intraoperative, and postoperative periods, the microbiology of infection, and the mortality of sepsis.
Method: The ethics council gave its consent before this study was conducted, and 200 patients from all of the surgical department's units who underwent urgent abdominal procedures were chosen for the investigation. Each patient was enrolled in the trial after providing written informed consent. Throughout the research period, patient data was recorded, including diagnosis, investigations, the surgical procedure carried out, intraoperative outcomes, postoperative time, prophylactic antibiotics, and follow-up period.
Result: The mean age of males was 39.1±18.0 years and that of females was 38.0±19.0 years; the difference in ages between the sexes was not statistically significant (p>0.05); the mean age of all subjects was 39.7±18.6 years, with a range of 66 years; the relationship between the wound class and culture was statistically different (p<0.05); and the culture was strongly associated with the wound class.
Conclusion: This study assessed how complicated the variables that affect surgical sepsis are. In contrast to past research like Brun Buisson C *et al*, where the incidence was around 22.8%, there is a diminishing incidence in this study. Effective surgical methods, proper bowel anastomosis with enough vascularity, proper haemostasis, blood transfusions to treat anaemia, bowel exteriorization in the presence of cross contamination, early mobilisation and use of effective antibiotics, a healthy nutritional state, and avoidance of hypotension are among the best resuscitation techniques.

Keywords: postoperative sepsis, abdominal surgeries, microbial infection, intraoperative result

Introduction

Postoperative sepsis is a challenging and irritating phenomenon seen by surgeons during the postoperative period. It continues to be a notable contributor to morbidity and mortality subsequent to emergency abdominal procedures. The escalation in treatment expenses is accompanied by a decline in work productivity, disturbance of routine activities, and unanticipated psychological strain experienced by patients in a general context. While preoperative prognostic indicators have been well acknowledged, the timely identification of postoperative sepsis continues to pose challenges. The intricate unregulated host response to infection encompasses uncontrolled inflammation and immunological suppression. At its most fundamental level, overt clinical infection can be understood as a disruption in the equilibrium between the mechanisms of host defence and microbial invasion [1, 2, 3]. Over time, surgeons have been concerned with the virulence of infections, the volume of microbial inoculum, and host defence in their efforts to combat infection. Several studies have been conducted to assess postoperative sepsis. However, due to the intricate nature of the issue, certain publications include limitations that hinder the ability to derive significant interpretations. There are individuals who fail to recognise the importance of implementing rigorous statistical control measures in order to differentiate between the random occurrences influenced by chance and the significant clinical factors that determine the occurrence of postoperative sepsis [4, 5].
The surgical experience is extensively diversified, which may include confounding factors in drawing conclusions regarding sepsis rates due to potential variations in the case material over time. The inclusion of varied cases in different times with varying propensities to develop postoperative sepsis will have an impact on the computed sepsis rates. The precise definition of surgical sepsis and the specific methodologies used, along with proper validation measures, are frequently overlooked. The relatively low occurrence rate of postoperative sepsis after clean surgery, ranging from one to five percent,

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necessitates the collection of several cases in order to facilitate a comprehensive analysis of the statistical data [6, 7]. The intricate interrelationship among several elements that contribute to the onset of postoperative sepsis presents a formidable challenge in isolating a single component as the primary determinant among numerous potential causes that could potentially influence the occurrence rate. The resolution of these fundamental issues in result analysis poses significant challenges, and despite the limitations of the current study, an investigation of the occurrence of postoperative sepsis has been conducted among patients who underwent emergency abdominal surgeries [8, 9].

Material and Method

After receiving approval from the ethics council, this study was carried out at Department of General Surgery, Government Medical College, Nalgonda, Telangana, India on 200 patients who underwent urgent abdominal procedures across all of the surgery department's units between July 2022 to June 2023 were chosen for the study. After receiving informed written agreement from each patient, they were all recruited in the study. Throughout the research period, patient information including diagnosis, investigations, the surgical procedure performed, intraoperative results, postoperative time, prophylactic antibiotics, and follow-up period were documented.

Inclusion Criteria

All Patients had Urgent Abdominal Surgery

Exclusion Criteria

1. Patients under the age of 12
2. Elective abdominal procedures performed on all patients.

Result

Table 1: Distribution according to age and gender

Age group	Male		Female		Total	
	Frequency	%	Frequency	%	Frequency	%
< 20	26	19.3	13	20	35	17.5
20-29	18	13.3	15	23.1	29	14.5
30-39	24	17.7	9	13.8	30	15
40-49	22	16.2	10	15.3	29	14.5
50-59	30	22.2	7	10.7	35	17.5
60-69	8	5.9	8	12.3	14	7
70-79	7	5.1	3	4.6	8	4
Total	135	67.5	65	32.5	200	100.0
Mean ± SD	38.5±18.0		38.0±25.0		39.6±19.2	
Significance	"t" =0.810, df=185, P=0.562				Range=15-85 = 70	

Table 2: Platelet counts according to the culture positive

Culture	Platelet normal		Elevated		Total		Results
	No	%	No	%	No	%	
E. coli.	0	0.0	16	8	16	8	
Klebsiella	0	0.0	16	8	16	8	
							χ^2 =180.000
Proteus	0	0.0	8	4	8	4	df= 3
							p<0.001
No growth	160	80	0	0.0	160	80	
Total	160	80	40	20	200	100.0	

Table 3: INR according to the culture positive

Culture	INR Normal		Elevated		Total		Results
	No	%	No	%	No	%	
E. coli.	0	0.0	16	8	16	8	χ^2 =184.000 df= 4 p<0.001
Klebsiella	0	0.0	17	8.5	17	8.5	
Proteus	0	0.0	7	3.5	7	3.5	
No growth	160	80	0	0.0	160	80	
Total	160	80	40	16.7	200	100.0	

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Table 4: Results according to the INR

Results	INR Normal		Elevated		Total		Results
	No	%	No	%	No	%	
Alive	160	80	0	0.0	160	80	χ^2 =184.000 df= 4 p<0.001
Sirs	0	0.0	15	7.5	15	7.5	
Septic Shock	0	0.0	5	2.5	5	2.5	
Death	0	0.0	20	10	20	10	
Total	160	80	40	20	200	100.0	

Discussion

200 emergency abdominal operations were performed as part of this study, and 40 cases—30 men and 10 women-of postoperative infections-were associated with those surgeries. 4:1 is the male to female ratio. According to this study, the prevalence of postoperative sepsis is 16.6%. According to earlier studies, it is around 22.8%. Appendicectomy is the most frequent emergency procedure, followed by major laparotomy. The most frequent hollow viscus perforation is duodenal. The level of gross contamination during surgery directly relates to the likelihood of infection. The length of the procedure is the next predictor affecting postoperative sepsis. Infection risk rises with prolonged exposure. Sepsis was ascribed to inadequate bowel preparation and poor hydration management during the emergency. The possibility of postoperative infection is increased by the possibility of faecal matter contamination during surgery or cross-infection with prior cases in the emergency OT theatres [10, 11, 12].

Other factors include incorrect diathermy use, poor hemostasis, and length of operation. Use of suture materials. The risk of infection increases when a theatre is contaminated due to inadequate ventilation. The rate of infection is influenced by surgeon factors such as hand washing method and normal commensals surgeon technique. Sepsis is exacerbated by patient characteristics such as poor personal cleanliness, delayed recognition of symptoms, delayed admission to medical facilities, male tobacco and alcohol use, and female anaemia. Late referrals from the peripheral health care facilities are another source of postoperative infection. To control postoperative infection, the following postoperative steps are crucial. Shaving properly and properly preparing the surgical spot before the procedure. Good aseptic environment education for the technicians. Asepsis environment maintenance requires a good theatrical environment with good ventilation. The use of suture materials and diathermy should be kept to a minimum. To remove grossly polluted materials, complete irrigation with 0.9% NACL with a minimum of 6L is required. The peritoneal cavity must be carefully cleansed with normal saline to remove any accumulation [13, 14, 15].

Maintaining complete hemostasis is important. When necessary, CRD should be applied to class IV wounds. Polyfilament suture material ought to be replaced with monofilament. The postoperative period calls for the administration of effective antibiotics, enough hydration, and blood glucose management. Patient mobilisation must begin sooner. It is important to begin oral feeding as soon as possible. Drain removal must be done quickly [16, 17].

Conclusion

This study evaluated the complex nature of the factors influencing surgical sepsis. There is a declining incidence in this study as opposed to earlier studies like Brun Buisson C *et al*, where the incidence was roughly 22.8%. This is because of the following actions. During the procedure, the surgical site should be free of hair and well antibiotic-covered. good resuscitation techniques, fluid adjustment effective surgical method, proper bowel anastomosis with sufficient vascularity, proper haemostasis, blood transfusions to treat anaemia, bowel exteriorization in the presence of cross contamination the early ambulation and mobilisation of effective antibiotic use, a healthy nutritional state, hypotension avoidance.

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