

Bacteriological Profile of Surgical Site Infection of Emergency Cases in a Tertiary Care Hospital In Karnataka: A Cross Sectional Study

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Abstract:

Background: Surgical site infection (SSI) is one of the most common causes of morbidity and mortality in surgical wards. To prevent such infections it is important to take into consideration all these factors and most importantly the bacteriological profile which assists a surgeon to decide over the strict prevention practices. With this back ground, we studied the bacteriological profile of the SSI admitted in our emergency surgical ward.

Materials and methods:

A prospective observational study was conducted among the patients who underwent emergency surgeries in a tertiary care hospital in Karnataka. The study was conducted for the duration of 4 months to achieve the sample size of 140. Post operatively, those patients who developed symptoms of surgical site infection, a swab for bacteriological profile was sent. Empirical antibiotics were started after the swab was taken and later changed based on the antibiogram of the culture report. Based on the bacteriological report the type of organism was noted and tabulated.

Results:

The mean age of the study subjects was 36.36 years with male preponderance in the present study. The most common diagnosis was appendicitis (49.29%) followed by perforation (20.71%). The most common organism isolated was *E coli* (30.77%) followed by *Klebsiella pneumonia* (7.69%) in the present study

Conclusions:

Appendicitis and perforation were the most common diagnosis in emergency surgeries in our study. *E coli* was the most common organisms isolated in the present study. Future studies on risk factors for SSI and follow up studies on the SSI have to be conducted to get better results.

Key words: Surgical Site infection; Surgery; Bacteriology

Date of Submission: 29-04-2021

Date of Acceptance: 13-05-2021

I. Introduction

Surgical site infection (SSI) is one of the most common causes of morbidity and mortality in surgical wards^{1,2}. The incidence reported is within range if 2 to 12 %³. SSI are the responsible for increased financial burden and increased days of hospital stay in middle income countries like India^{4,5}. These infections are caused by various exogenous and endogenous factors⁴. Patient related factors like old age, nutritional status, associated co morbidities and pre existing infection and surgeon related factors like poor surgical technique, prolonged duration of surgery, inadequate sterilisation and poor preparation pre operatively are some factors which increase the risk of SSI⁴. Apart from these risk factors, virulence and invasiveness of the organism and immunity of the host are important factors^{4,5}. To prevent such infections it is important to take into consideration all these factors and most importantly the bacteriological profile which assists a surgeon to decide over the strict prevention practices⁶. With this back ground, we studied the bacteriological profile of the SSI admitted in our emergency surgical ward.

II. Materials And Methods

A prospective observational study was conducted among the patients who underwent emergency surgeries in a tertiary care hospital in Karnataka. The study was conducted for the duration of 4 months to achieve the sample size. A study conducted by Akhter MSJ et al⁷ reported the rate of SSI in their study to be

11%. Using this with 5.5% absolute error and 95% confidence interval, we found the minimum sample size to be 124. Considering 10% attrition rate, we finalised our sample to be 136. But for our convenience, we have included 140 cases in the present study. Necessary permissions were taken before the start of the study. During the duration of the study, emergency cases performed by all the units of the surgery department have been included in the study.

Data was collected using pre designed case record form which had details of demography, clinical history and examination, various investigations done pre operatively and the site and type of surgery. Post operatively, those patients who developed symptoms of surgical site infection, a swab for bacteriological profile was sent. Empirical antibiotics were started after the swab was taken and later changed based on the antibiogram of the culture report. Based on the bacteriological report the type of organism was noted and tabulated.

Statistical analysis:

The data was collected, compiled, and analyzed using EPI info (version 7.2). The qualitative variables were expressed in terms of percentages. The quantitative variables were both categorized and expressed in terms of percentages or in terms of mean and standard deviations.

III. Results

We have included 140 cases in the present study.

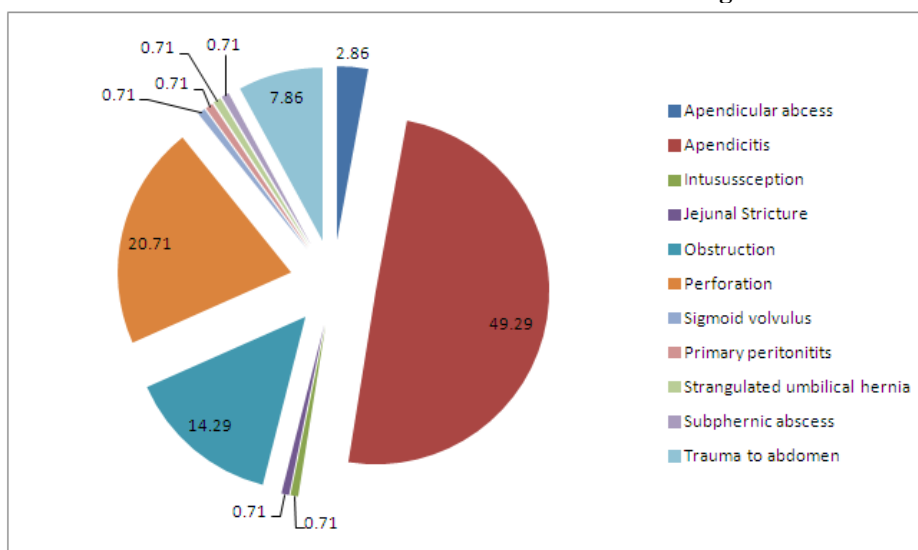
Table 1: Demographic particulars of the sample

Demographic particulars	Frequency/ Mean	%/SD
Age	36.36	17.14
Gender		
Female	47	33.57
Male	93	66.43

%-Percentage; SD-Standard deviation

The mean age of the study subjects was 36.36 years with male preponderance in the present study.

Chart 2: Distribution of the cases based on the diagnosis



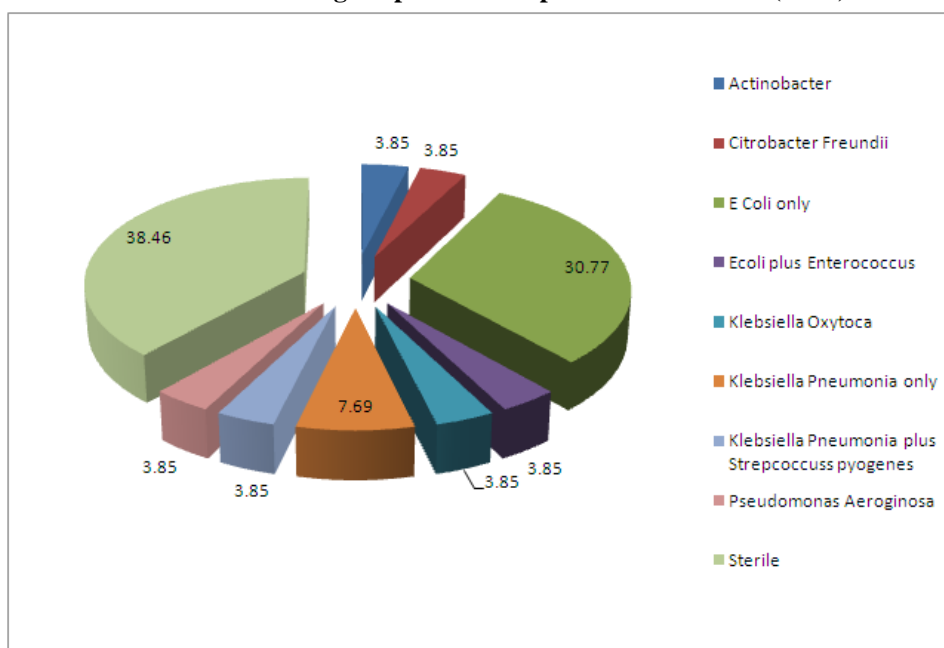
The most common diagnosis was appendicitis (49.29%) followed by perforation (20.71%).

Table 3: Distribution of cases based on pre surgical investigations

Pre operative investigations	Mean	SD
Haemoglobin	12.43	2.65
Total leukocyte count	11734.16	4956.27
Random blood sugar	112.77	70.17
Serum albumin	3.32	0.81

The mean haemoglobin levels were 12.43 gm/dl, total leukocyte count was 11734.16, random blood sugar was 112.77 and serum albumin was 3.32mg in the present study.

Chart 4: Bacteriological profile of suspected site infection (n=26)



The most common organism isolated was E coli (30.77%) followed by Klebsiella pneumonia (7.69%) in the present study

IV. Discussion

Despite the advances in the infection control measures, management of SSI remains a common problem for surgeons⁸⁻¹¹. Rapid resistance to antibiotics and exposure to nosocomial pathogens during the hospital stay further increases the existing problem of management of these wounds^{12,13}. We conducted this study to understand the bacteriological profile of SSI in our setup which will help us in better understanding of the microbial aetiology of SSI.

E Coli was the most common organism isolated in the present study. A study conducted by Negi V et al¹⁴ reported that Staphylococcus aureus (50.4%) was the most common organism in their study. Further E coli was the second most common organism they reported. They also reported some resistant patterns of staph aureus in their study which were not reported in our study. Another study conducted by Kasukurthy LR et al¹⁵ reported that Methicillin resistant Staph aureus was the most common organism isolated in their study. Similar inferences were reported by Mahat P et al¹⁶, Akhter MSJ et al⁷, Mundhada AS et al¹⁷ and Njoku CO et al¹⁸. In a multi centeric study conducted by Mekhla et al⁵ reported that perforation and appendicitis constituted more than half of the patients in their study. Our study was in accordance with the present study.

Our study had some limitations. Firstly, it was a cross sectional study. Longitudinal follow up studies would have been better. Secondly it was a single center study, multi centeric studies will give a better clearer picture of bacteriological profile of the patients in different geographical region. Nonetheless, this was the first study which proposed the bacteriological profile in emergency setup.

V. Conclusions

Appendicitis and perforation were the most common diagnosis in emergency surgeries in our study. E coli was the most common organisms isolated in the present study. Future studies on risk factors for SSI and follow up studies on the SSI have to be conducted to get better results. The profile will assist us to giving pre operative and post operative antibiotic horizon to manage the patient in a better way.

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