

# Original Article



## Bacteriological analysis of infected wound and their antibiotic sensitivity following emergency caesarean section-a study of 100 cases

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### Abstract

**Background:** Emergency caesarean section is one of the commonly performed operation in the department of gynae and obstetrics. **Objectives:** The aim and objective of the study was to evaluate the organisms responsible for post emergency caesarean wound infection and their antibiotics sensitivity. **Materials & Methods:** The study is a prospective type of cross sectional study where 100 patient of post emergency caesarean wound infection was evaluated during July 2012 to December 2012 (6 Month Duration) at Rajshahi Medical College Hospital (RMCH) Rajshahi. The wound swab was sent for culture and sensitivity test. **Results:** The peak incidence of wound infection to between 6th - 8th post operative day. In wound discharge shows various organism but 16% showed no growth. The most of the infected wound showed (48%) thick creamy pus and the organisms isolated is *Staphylococcus*. antibiotics mostly used were Ciprofloxacin, Cephadrine and Metronidazole. This study revealed that maximum wound infection is due to *S. aureus*. Regarding antibiotic sensitivity of the cultured organisms, all of them are sensitive to Imepenem (100%). *Staphylococcus aureus* mostly sensitive to Flucloxacillin (79.16%). Ciprofloxacin sensitivity is found in 58.33% cases. *E coli* mostly sensitive to Imepenem (100%) followed by Ceftriaxone (53.84%). *Klebsiella pneumonia* found mostly sensitive to Imepenem (100%) followed by Ceftriaxone (75%) and Cephadrine (50%). **Conclusion:** Selection of appropriate antibiotic is important to reduce post caesarean wound infection.

**Key words:** Bacteriological analysis. Culture sensitivity, Wound infection.

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### Introduction

Post-operative wound infection is one of the common problem in surgical patient including caesarean section. It is a multifactorial problem but antibiotics sensitivity of the infective organism is one of the important issue. Emergency caesarean section is one of the commonly performed operation in the department of gynae and obstetrics. Wound infection following emergency caesarean section is one of the important cause of maternal morbidity.<sup>1</sup> The current study highlights on the post emergency caesarean wound infection and their bacteriological study and antibiotic sensitivity. The aim and

objective of the study was to evaluate the organisms responsible for post emergency caesarean wound infection and their antibiotics sensitivity and thereby to reduce the complication of wound infection.

### Materials and methods

The study were enrolled a prospective type of cross sectional study. In this study 100 patient having post emergency caesarean wound infection was considered during the study period.

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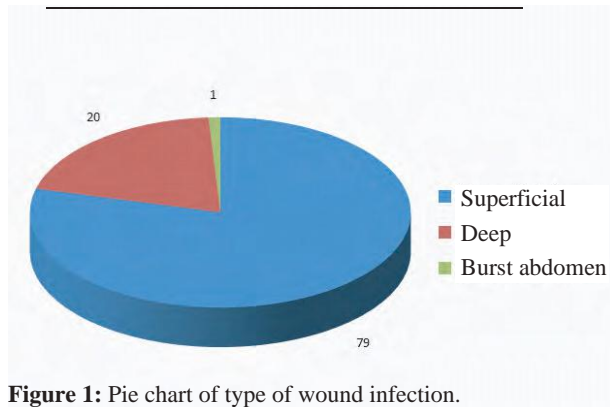
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The study was performed in the department of gynae and obstetrics in Rajshahi Medical College Hospital from July 2012 to December 2012. All cases having post-operative wound infection following emergency caesarean section during the study period was included. The wound swab was sent to the department of microbiology for culture and sensitivity test. The number of patients developed wound infection during this period was 100. The necessary data were collected and later on analysis of the recorded data was done.

**Results**

**Table I:** Type of wound infection.

Type of wound infection	Number	%
Superficial	79	79%
Deep	20	20%
Burst abdomen	1	1%
Total	100	100



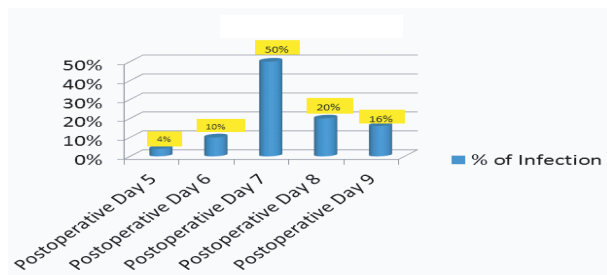
**Figure 1:** Pie chart of type of wound infection.

The above table shows most of the wound infections were superficial (79%) and deep wound infection is 20%. Only 1 case was detected as burst abdomen.

**Table II:** Post-Operative Day of Infection.

Post-Operative Day of Infection	Number of Infection	Total Infected Cases	% of Infection
5	4	100	4%
6	10	100	10%
7	50	100	50%
8	20	100	20%
9	16	100	16%

The table shows most of the post-Operative wound infection occurred on the 7th post-Operative day.

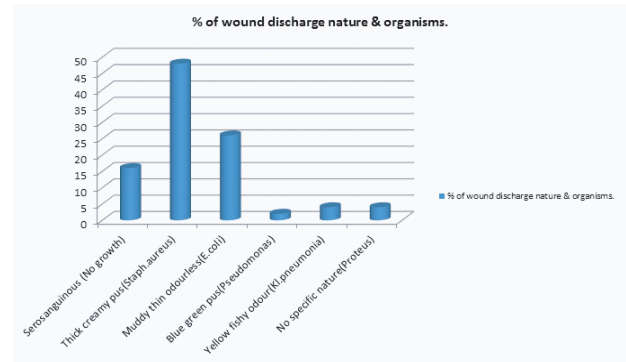


**Figure 2:** Postoperative day of wound infection.

**Table III:** Nature of wound discharge and organisms.

Nature of discharge	organisms	n	%
Serosanguinous	No growth	16	16.0%
Thick creamy pus	Staphylococcus auerus	48	48.0%
Muddy thin odourless	E.coli	26	26.0%
Blue green pus	Pseudomonas	2	2.0%
Yellow fishy odour	Klebsiellapneunonia	4	4.0%
No specific nature	Proteus	4	4.0%

The above table shows the nature of discharge from the infected wound of which thick creamy pus (48.0%) followed by muddy thin odourless discharge 26.0% and 16.0% of discharge is serosanguinous in nature indicating no growth.

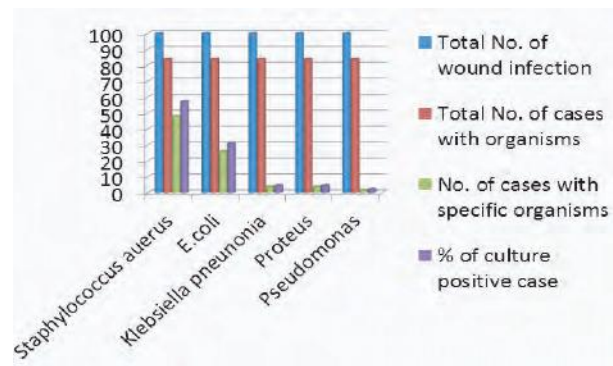


**Figure 3:** Bar diagram of nature of wound discharge and organisms.

**Table IV:** Incidence of wound infection and organisms.

Total no. of wound infections	No. of case by isolation of organisms	Name of organism	n	%
100	84	Staphylococcus auerus	48	57.14
		E.coli	26	30.95
		Klebsiella pneunonia	4	4.76
		Proteus	4	4.76
		Pseudomonas	2	2.38

The above table shows the percentage of isolated organisms from the cultured wound swab in which most common organism was Staphylococcus aureus and least common was Pseudomonas.

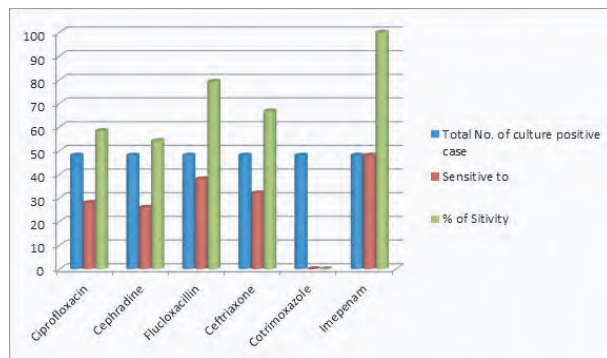


**Figure 4:** Bar diagram of incidence of wound infection and organisms.

**Table V:** Antibiotics sensitivity of the cultured organisms.

Organism isolated	Name of sensitive Antibiotics with percentage												
	Name	No.	Ciprofloxacin	Cephadrine	Flucloxacillin	Ceftriaxone	Cotrimoxazole	Imepenem	No.	%	No.	%	
S.aures	48	28	58.33	26	54.16	38	79.16	32	66.66	-	-	48	100
E.coli	26	8	30.76	10	38.46	-	-	14	53.84	12	46.15	26	100
Klebsiella pneumonia	4	2	50	2	50	-	-	3	75	1	25	4	100
Proteus	4	3	75	2	50	-	-	3	75	-	-	4	100
Pseudomonas	2	1	50	1	50	-	-	1	50	-	-	2	100
No growth	16												

Regarding antibiotic sensitivity of the cultured organisms, all of them were sensitive to Imepenem (100%). Staphylococcus aureus mostly sensitive to Flucloxacillin (79.16%) followed by Cephadrine (54.16%) and Ceftriaxone (66.66%). Ciprofloxacin sensitivity was found in 58.33% cases. E. coli mostly sensitive to Imepenem (100%) followed by Ceftriaxone (53.84%) and Cotrimoxazole (46.15%) respectively. Klebsiella pneumonia was found to be mostly sensitive to Imepenem (100%) followed by Ceftriaxone (75%) and Cephadrine (50%) and Ciprofloxacin (50%) respectively. In case of Proteus infection most of the sensitive antibiotic was Imepenem (100%) followed by Ciprofloxacin and Ceftriaxone both of which were 75% sensitive. In case of Pseudomonas infection, following Imepenem, the organism was equally sensitive to Ciprofloxacin, Cephadrine and Ceftriaxone.



**Figure 5:** Bar diagram of antibiotics sensitivity of the cultured organisms

**Discussion**

This prospective study was carried out with an aim to evaluate the post emergency caesarean section wound infection regarding the underlying factors and the causative organisms with their antibiotic sensitivity. In this study 100 patient of wound infection following emergency caesarean section was evaluated. In this study 79(79%) of infected wound was superficial type, 20(20%) deep type and 1(1%) was burst abdomen. In this study the peak incidence of wound infection to between 6th-8th post-operative day (Figure 2) Al-Falloujed and Mcbrien<sup>1</sup> in 1998 showed the same result. In this study the appearance of abdominal wound infection was highest at 7th

post-operative day (50%). Alexander and Prudden showed the largest number of wound infection became clinically evident on the 7<sup>th</sup> post-operative day and on an average of 6.8 post-operative day.<sup>2,3</sup> They suggested the cause may be associated with haematoma, anaemia, malnutrition and suture demolation.

**Nature of discharge and organisms**

- Serosanguinous - No growth
- Thick creamy pus - Staphylococcus aureus
- Muddy thin odourless - E. coli
- Blue green pus - Pseudomonas
- Yellow fishy odour - Klebsiella pneumonia
- No. specific nature - Proteus

The most of the infected wound showed (48%) thick creamy pus and the organisms isolated was Staphylococcus.16% of the discharge is serosanguinous in nature and showed no growth (Table III). Regarding infection and organism, antibiotics mostly used were Ciprofloxacin, Cephadrine and Metronidazole, Rasul G, Ashraf et al did not use any antibiotics in 65 selected cases. There was not a single incidence of infection.<sup>4</sup> The result of recent clinical trials of perioperative antibiotic therapy after emergency abdominal.<sup>5</sup> surgery support such policies causative organisms detected were staphylococcus aureus (57.14%), E.Coli (30.95%), Klebsiella (4.76%), Proteus (4.76%) Pseudomonas (2.38%) This study revealed that maximum wound infection was due to S. aureus. Next common was E.coli (Table V). Aziz in 1997 in Dhaka Medical College Hospital, reported that among 100 patients 60 had positive wound culture and S. aureus, E. coli, Streptococcus, Pseudomonas and proteus were the common infective organisms.<sup>6</sup> Matin in 1981 in the Institute of Post Graduate Medicine and Research (now BSMMU) noted the commonest infective organism in his series is Coliform (60%) followed by Staphylococcus (40%).<sup>7</sup> Regarding antibiotic sensitivity of the cultured organisms, all of them are sensitive to Imepenem (100%). Staphylococcus aureus mostly sensitive to Flucloxacillin (79.16%). Ciprofloxacin sensitivity is found in 58.33% cases. E. coli mostly sensitive to Imepenem (100%) followed by Ceftriaxone (53.84%) and Cotrimoxazole (46.15%) respectively. Klebsiella pneumonia were found mostly sensitive to Imepenem (100%) followed by Ceftriaxone (75%) and Cephadrine (50%) and Ciprofloxacin (50%) respectively. In case of proteus infection most of the sensitive antibiotic was Imepenem (100%) followed by Ciprofloxacin and Ceftriaxone both of which are 75% sensitive. In case of Pseudomonas infection, following Imepenem, the organism was equally sensitive to Ciprofloxacin, Cephadrine and Ceftriaxone.

**Conclusion**

If we had a well equipped obstetric ward with clean environment and adequate facilities, a planned operation theatre and overall consciousness of the patient and their family about the health of a pregnant women, the incidence of post caesarean wound infection and their complication is bound to come down with only minimal use of antibiotics. Selection of appropriate antibiotic is very much important in the treatment of infected wound following any surgery to reduce the morbidity and complication.

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