



SURGICAL SITE INFECTION IN EMERGENCY AND ELECTIVE LOWER SEGMENT CAESAREAN SECTION IN TERTIARY HOSPITAL

Author 1: Dr. Shankar Burute(Professor)

Author 2: Dr.Paidi Naga Rachana(Junior Resident 2nd year)

Author 3:Dr. Apoorva Dhankhar(Junior Resident 1st year)

Author 4 : Dr. Amidha Shukla

^{1,2,3,4} Department of Obstetrics and gynecology , Dr. D.Y. Patil medical college, Hospital and Research center, Pimpri Pune 411018

Corresponding Author: Dr. Paidi Naga Rachana

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ABSTRACT

Background

The aim of the study is to study surgical site infections in emergency and elective LSCS and to identify etiological microbes and their antibiotic resistance pattern in tertiary hospital.

Material and methods

A total of 100 postoperative cases, 50 of emergency LSCS and 50 of elective LSCS were studied prospectively over a period of 1 year. Cases were assessed in detail with adequate history and examination of surgical site. Immunocompromised, diabetic and patients of less than age 18 were excluded from study. Swabs were taken for microbiological examination.

Results

Surgical site infection was found to be 20% out of which about 14 cases (28%) were of emergency LSCS whereas 6 (12%) were of elective LSCS. 54% were between the age group of 18- 25 yrs. 72% were from rural geographical areas. About 21% of total infections were due to gram positive bacteria of which staphylococcus aureus was most common and 27% were due to E.coli, most common in gram negative bacteria. Staphylococcus aureus was found to be maximum resistant to methicillin whereas E.coli was found to be to ceftazidime.

Conclusion

A proper assessment of risk factors and their modification may help in reducing surgical site infection rates also assessment of all

<p>CC License CC-BY-NC-SA 4.0</p>	<p>the pathogens involved and their resistance pattern may help in reduction of the same. Prudent use of antibiotics are to prevent development of future resistance patterns.</p> <p>Key words - surgical site infection , LSCS, staphylococcus aureus , E. coli</p>
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Introduction:

The infection of a wound can be defined as the invasion of tissues by the microorganism following breakdown of local and systemic host defences. The postpartum period is a challenging time for a woman and a postoperative complication further adds to her worries. Wound complications following caesarean section is common and accounts for a significant extension of hospital stays and adds considerable cost to hospital.¹Wound complications occur from time to time in which the majority are of minor importance responding promptly to therapy however a small group may fall prey to a major complication.

Studies support the concept that reduction in postoperative wound complication is directly related to increase awareness of its causes and its prevention. The incidence of wound complication in any surgery can be ascertained only by carefully analyzing the result in all postoperative cases over a significant amount of time, also the risk factors prove to be a major catalyst in development of these complications.

Material and method:

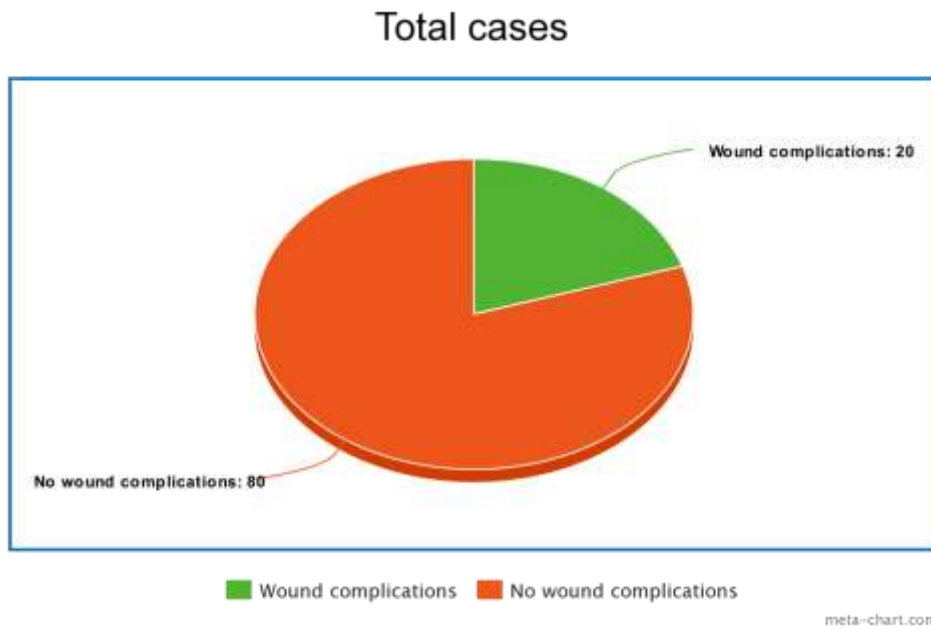
On approval from the ethical committees and after written informed consent from patients the study was done over a period of 1 year in the department of OBGY in our institution in Pune. A total of 100 cases of LSCS were taken into account of which, 50 were of emergency LSCS and 50 were elective LSCS. All cases with an age less than 18 years, immunocompromised and diabetic cases were not taken into the study.

PLAN OF STUDY

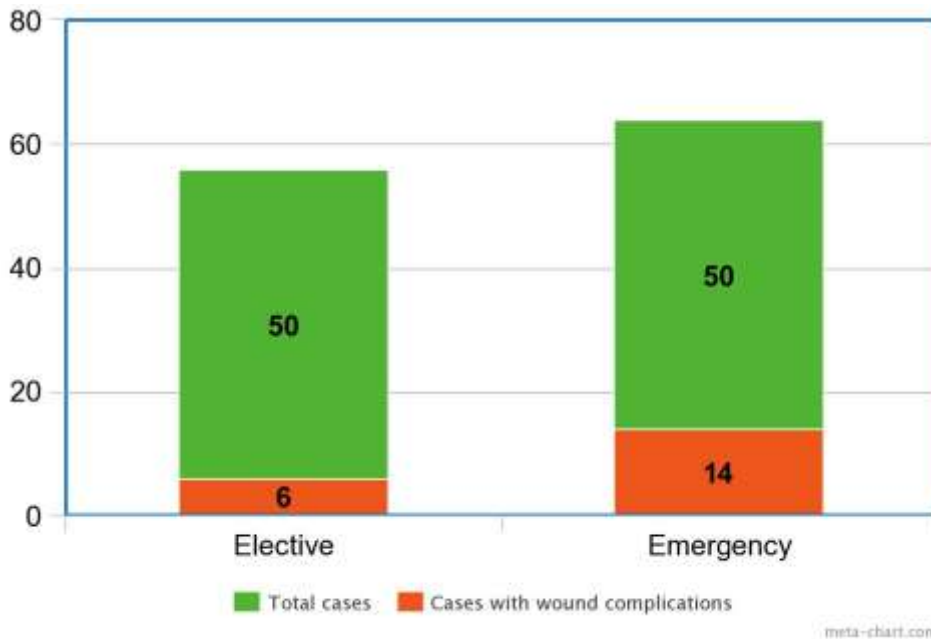
- Detailed history was taken that contains age, residential status, date of admission, date and type of LSCS
- Date of development of surgical site infection
- Pre and postoperative antibiotics
- History of any risk factors
- Details of any clinical complaints
- Inspection of the surgical site was done, and all characteristics were noted
- Samples of discharge were collected by two different swabs, one for bacterial culture and other for grams staining. These were transported to the laboratory immediately.
- Each sample was plated onto blood agar and MacConkey agar and incubated aerobically at 37degree C for 18 to 24 hours and then examined for bacterial growth and colony characteristics.
- Bacterial isolates obtained were identified as per microbiological identification.

Results

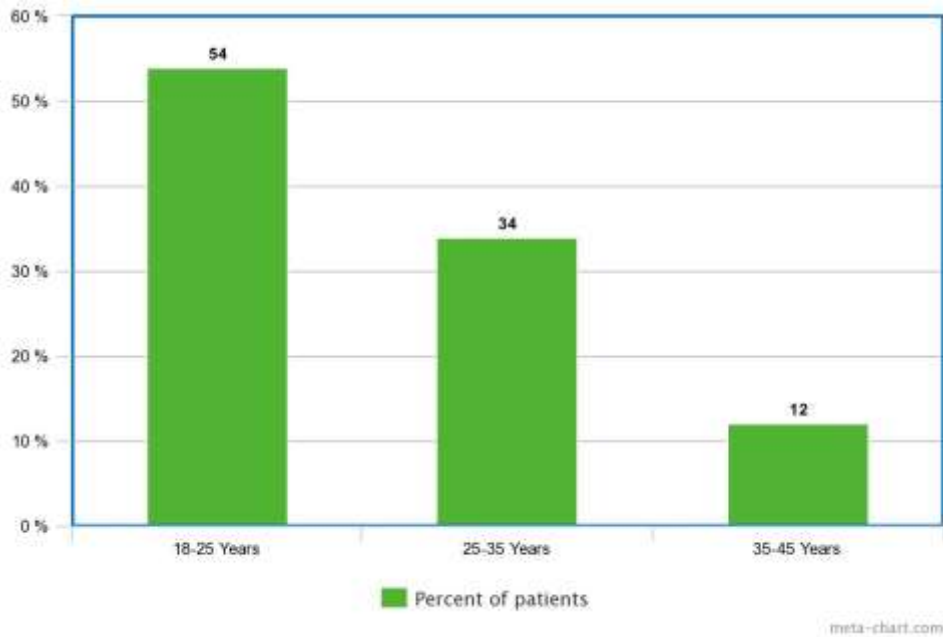
1. The total surgical site infections accounted for 20%



2. Out of 50 cases of emergency LSCS about 14 developed surgical site infection whereas out of 50 cases of elective LSCS only 6 developed surgical site infection.

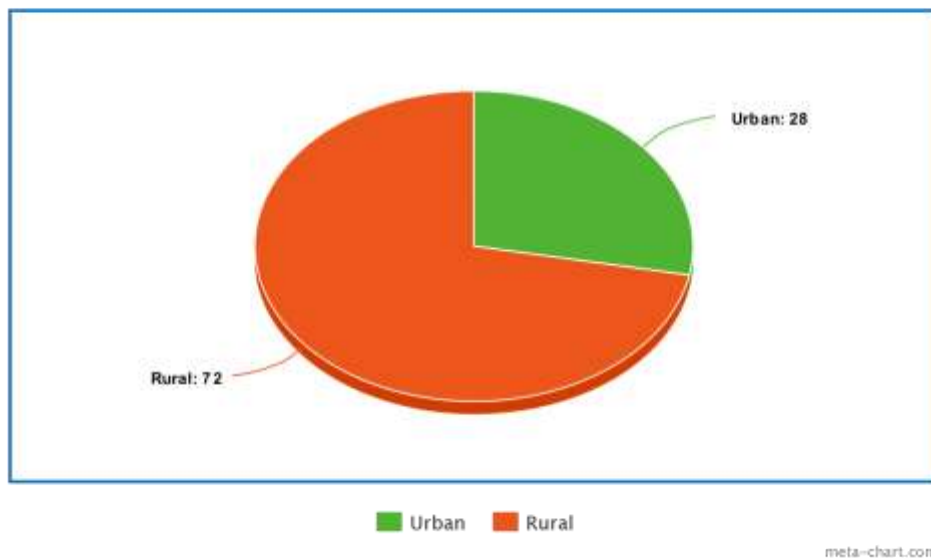


3. Majority of the patients were between the age group of 18 to 25yrs about 54% of total wound infections.



4. Out of 20 cases of surgical site infection 72% (14) were from rural geographical area whereas 28% (6) were from urban areas.

Total infected cases



5. Pathogenic organisms were isolated from 15 cases (75%) out of 20 cases with surgical site infection including one case which showed polymicrobial growth and 5 cases (25%)

did not show any growth may be due to preoperative antibiotics or the microbes were anaerobic.

6. Most common organism isolated was E.coli (27%) followed by staphylococcus aureus (21%).

ORGANISMS ISOLATED	NUMBER
• Staph aureus	4(21%)
• Coagulase negative staph	3(15%)
• Enterococcus spp	1(3%)
• Escherichia coli	6(27%)
• Klebsiella spp	2(12%)
• Pseudomonas aeruginosa	1(3%)
• Citrobacter freundii	1(3%)
• Proteus vulgaris	1(3%)
• Acinetobacter spp	1(3%)

7. E.coli was found to be most resistant to ceftazidime whereas staphylococcus was maximum resistant to methicillin.

RESISTANCE PATTERN OF GRAM POSITIVE ORGANISMS IN PERCENTAGE

ORGANISM	linezolid	vancomycin	azithromycin	ciprofloxacin	cefixime	amoxicillin	methicillin
Staph Aureus	5.8	29.4	17.6	23.5	41.1	52.9	88.23
Coag. Neg. staph	10	20	10	20	30	60	80
Enterococcus	0	50	75	25	75	50	100

RESISTANCE PATTERN OF GRAM-NEGATIVE ORGANISMS IN PERCENTAGE

ORGANISM	imipenem	amikacin	ceftazidime	ciprofloxacin	ofloxacin	ceftriaxone	Amoxicillin clavulanate
E.coli	0	33	61.9	42	47	38.1	57.14
Klebsiella sp	0	22.2	55.5	44.4	11.2	33	22.2
Pseudomonas	14.2	42.8	0	57.1	41.8	26.5	0
Citrobacter	0	40	20	40	20	20	20

Discussion

The current study was done at DR. D Y Patil medical college and research center taking into account 100 cases undergoing LSCS of which 50 underwent elective LSCS and 50 underwent emergency LSCS. Caesarean section surgery has a 5-20 times higher risk of postpartum infection

as compared to vaginal deliveries, mainly with regards to wound infections, endometritis, pelvic peritonitis or pelvic abscesses.²Wound infections are still regarded as the most common nosocomial infections in patients undergoing surgery. The study conducted by A.R Mahale et al, (2008) the rate of overall infection was about 8.6%.³In a study conducted by Thach son Tran et al, (2000) the overall rate of postoperative infection was 12.4% which was reported in prospective study of 1319 caesarean sections. In this study the overall wound infection rate is 20%.

The most common pathogens were *E.coli and staph aureus*. Shittu *et al.* recommended collaboration with a microbiologist and wound-care practitioners, and patient education on personal hygiene to help control wound infections.⁴In this study *E.coli* was found to be most isolated organism followed by staphylococcus aureus.

Satyanarayan *et al.* reported rates of wound infections as high as 25.2% in emergency Caesarean section compared to 7.6% in elective cases.⁵In this study 28% surgical site infections were reported after emergency LSCS whereas 6% after elective LSCS. HansaDhar et al.; studied a cumulative total of 7,923 CS surgeries and showed a higher infection rate was noted in emergency (119, 1.50%) in comparison with elective (92, 1.16%) LSCS procedures.⁶ In the study conducted by Pelle H et al (2011). wound complications in elective Is Caesarean section was 3.8% which is less compared to emergency caesarean section 7.5% comparable to our study.⁷ The mean age distribution among cases of surgical site wound infection in elective LSCS is 25 years and emergency LSCS is 24 years. About 75.5% (192) cases with surgical site wound infection belong to upper lower and lower middle socio-economic class.⁸ In this study the mean age in which surgical site infections were more seen was between 18 to 25 year, the reason maybe since the peak child bearing age lies in between this age group in India.

The frequency of Caesarean section wound infections can be prevented by educational programs designed to raise public and clinical awareness. Modifiable risk factors like BMI and associated comorbid medical problems, such as diabetes and hypertension, should be closely monitored and controlled in the pre-pregnancy period. Some of the cases with wound infections in the current study were noted to have poor personal hygiene. Standards of personal hygiene differ according to the individual patient. Women opting for a Caesarean section for non-medical reasons should be informed about the risks of surgical site infection as a complication.^{9,10} Measures should be taken in the pre-, intra- and postoperative phases to reduce the risk of infection. In the preoperative phase, certain measures can be beneficial- for example, bathing on the day of the surgery, avoiding the unnecessary shaving of hair, the use of electric clippers, the proper sterilization of instruments, antibiotic prophylaxis and patient-specific theatre-wear. Additionally, handwashing, the antiseptic preparation of the surgical site and the use of appropriate staff theatre-wear should be encouraged. Intraoperative infection prevention can be aided by one of the latest practices worldwide, which is the use of monofilament sutures. The use of subcuticular sutures buried in the wound is also very unlikely to cause infection.¹¹

Conclusion

In this study the overall surgical site infection amounted to about 20% which was seen more in emergency LSCS cases. The most affected age group was between 18-25 yr mostly from rural population. Also the most common organism found in the infections was E.coli followed by staphylococcus aureus. Maximum resistance of E.coli was found to be to ceftazidime whereas staph aureus was resistant to methicillin. The need to reduce surgical site infection is currently receiving considerable attention and requires more research. Reducing the rate of surgical site infection will help to reduce the unnecessary morbidity and associated socioeconomic consequences for the patient and her family. Recommendations include addressing modifiable risks factors in the preconception period, ensuring a sterile environment, aseptic surgeries, meticulous hemostatic techniques and the use of antimicrobial prophylaxis to reduce the incidence of infection. Additionally, an organized system of wound surveillance and reporting may help to reduce the wound infection rate to an attainable minimum.

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