



STUDY OF INCIDENCE AND CAUSATIVE FACTORS FOR SURGICAL SITE INFECTIONS FOLLOWING CAESAREAN SECTION

Gynaecology

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ABSTRACT

Introduction- Surgical site infection (SSI) is a common health care associated infection worldwide affecting both developing and developed countries. Along with increased financial burden it is also responsible for increased physical and psychological stress to patient. **Material and methods-** Three hundred consecutive cases of caesarean section performed for various indications were studied and analyzed for incidence and reasons for surgical site infections. **Results-** Incidence of surgical site infection following caesarean section was found to be 4.33%. Obesity/overweight, anaemia, previous LSCS scar were common risk factors associated with development of SSI. **Conclusion-** The incidence of SSI in present study was in acceptable limits. Obesity, anaemia, previous LSCS scar, non-compliance with post operative instructions were responsible for development of SSI. Majority of surgical site infections can be prevented by pre, intra and post operative phases of care.

KEYWORDS

Surgical site infections, Caesarean section, Post operative morbidity

INTRODUCTION-

Caesarean Section is the most common surgical procedure performed on women worldwide. 1 Procedure is carried out to ensure the safety of mother and fetus. Some of the indications for emergency caesarean section include dystocia, premature membrane rupture, abnormal presentations of the fetus, premature placental detachment. 2. Like other major surgeries, it has complications such as haemorrhage, infection, and venous thrombo-embolism especially in pelvic veins and veins of lower limbs. 3. One of the frequent complications that occur following Caesarean section is surgical site infection (SSI); a health care associated infection, which occurs after an invasive (surgical) procedure. 4. It has considerable impact on post-operative hospital stay and cost of hospitalization. Fever without apparent cause after surgery should always awaken suspicion for wound infection. 5.

Another complication related to Gynaecological and obstetrical abdominal surgery is wound dehiscence that is parting of layers of surgical wound, either the surface layers separate or complete wound splits open. 6. Wound infection is one of the causes for wound dehiscence; other causes include type of surgical suture material used, pressure/tension on sutures, incorrect suture technique used to close the incision, weak muscle or tissue at incision site, and severe vitamin C deficiency. 7. Some of the important risk factors associated with surgical wound infection and dehiscence are obesity, poor nutrition, diabetes mellitus, presence of prior scar at incision site, severe coughing, straining, or vomiting following surgery, poor immunity and non-compliance with post-operative instructions.

Material and Methods-

This was a prospective observational study conducted at Department of Obstetrics and Gynaecology of medical college for a period of 6 months, from April 2017 to September 2017. Institutional ethics committee approval was obtained for the study. Consecutive three hundred cases, who underwent caesarean section, either emergency or elective and developed either surgical site infection and or wound dehiscence during study period were considered as study subjects for finding out incidence of SSI and risk factors associated with surgical site infections and wound dehiscence. Cases were monitored for evidence of infective morbidity, clinical evidence of surgical site infection like pain, discharge-serous or blood stained, redness at surgical site and wound dehiscence. Variables that were studied were number of cases that undergo caesarean section and develop surgical site infection, pre-operative and post-operative haemoglobin level, type (primary/repeat), indication and timing (before/after onset of labour) of caesarean section, type of surgical suture material used to close the skin incision, post operative day, when surgical site infection occurred. The pertinent data was collected from hospital records (admission register, operation theatre register, indoor case file,

treatment register). Collected data was entered in excel sheet and tables were made according to study objectives.

Results-

Three hundred cases of caesarean sections were observed for their outcome. It was observed that the incidence of Surgical Site Infection following caesarean section was 4.13%. (Table 1) Previous Surgical Scar (46.15%) and Anaemia (15.38%) were most common observed risk factors. (Table 2) Sixty four percent cases of caesarean section had normal (as per WHO guidelines) haemoglobin level, while 25.66% had moderate anaemia and 0.66% had severe anaemia. Incidence of SSI was more in the age group of 26 – 30 years. Incidence of SSI was 7.52% and 2.89% with the use of Ethilon 2.0 and Vicryl 2.0 respectively. (Table 3) In Present study 69.32 % cultures showed bacterial growth, while 30.76 were sterile. Staphylococcus aureus was commonest organism isolated 53.84%. Klebsiella was isolated from 7.69% cultures and 7.69 cultures were poly microbial. (Table 4)

DISCUSSION-

Incidence of wound infection following Caesarean section studied by Piret Mitt et al. In his cross-sectional survey carried out in tertiary care obstetric and gynecological center was 6.2%. 8 According to Demisew et al surgical site infection rate in his prospective study on 770 women was 11.4%. Infection rate following Caesarean section was more than that following Hysterectomy. 9 In India the infection rate was 24.2% including post discharge surveillance in a study conducted at Lady Hardinge Medical College, New Delhi. 10 In a study conducted by Ansar A, incidence of SSI following Caesarean section was 5.8%. In present study incidence of SSI was 4.33% following caesarean section. 11

In a study of 15 cases who developed wound infection out of 3500 cases studied retrospectively by John Spiliotis et al, COPD was found in 10 cases (66.66%), obesity in 6 cases (40%), malnutrition in 5 cases (33.33%), anaemia in 6 cases (40%), diabetes in 6 cases (40%), history of previous radiotherapy or chemotherapy in 6 cases (40%) and 3 cases (20%) were on steroids. 12 Waqar et al studied 117 cases, out of which obesity was found in 13%, anaemia in 17% cases, under nutrition in 13% cases and Malignancies in 15% of cases. 13 Ansar A Studied 500 cases of caesarean section which were performed for various indications, he reported that among the patients who developed SSI, 23% were obese, 55% had anaemia, 52% previous caesarean scar. 31 In present study, the risk factors found were obesity in 7.69%, previous LSCS scar in 46.15%, anaemia in 15.38%, while in 30.76% cause was unknown.

Tan et al. conducted a study comparing the incidence of SSI with the suture material used and reported that absorbable and non-

absorbable sutures have similar short-term outcomes but non-absorbable sutures have a disadvantage of requirement of removal. Additionally, late-term itching at the scar site was seen more frequently in absorbable suture material group possibly due to the late absorption of this kind of suture material. 14 Study Conducted by Tefvik Guvenal et al. showed that there was no significant difference in terms of wound complications. There is a tendency to get better wound healing with non absorbable suture materials, although this difference did not affect the patient's satisfaction rate. Rate of Surgical Site Infection observed with absorbable suture Vicryl 2.0 was 2.89% and that with non-absorbable Ethilon 2.0 was 7.52% in this study.¹⁵

Amongst 150 cases of wound infection studied by J.Y. Chia et al, 22.8% showed no bacterial growth in wound discharge sent for culture and sensitivity and 77.2% cultures were positive for bacterial growth. Among the etiologic agents found in this study, staphylococcus aureus was the commonest 58.1% of which 49.5% were Methicillin sensitive staphylococcus aureus and 8.6% were methicillin resistant staphylococcus aureus. This was followed by streptococcus species 10.5% and klebsiella 9.5%.¹⁶ In survey done by Pandit et al, 16.6% cases culture grew organisms, out of which staphylococcus aureus was the commonest 10% followed by enterobacter 6.6% and klebsiella species 3.3%.¹⁷ In study conducted by Ansar A, single microbial infection was noted in 12 (39%) cases and polymicrobial infection in 13 (42%). E.coli was the most common organism isolated followed by Staphylococcus aureus. E. coli was isolated in 14 (48 %) cases. Staphylococcus aureus was grown in 6 (20 %) cases.³¹ In Present study 69.32 % cultures showed bacterial growth while 30.76 were sterile. Staphylococcus aureus was commonest organism isolated 53.84%. Klebsiella was isolated from 7.69% cultures and 7.69 cultures were poly microbial.

CONCLUSION-

Surgical Site Infection is the most common hospital acquired infection affecting both developing and developed countries. The incidence of SSI in present study was within acceptable limits. Presence of patient related risk factors like obesity, anaemia, previous LSCS scar, non-compliance with post operative instructions and other factors like large patient turnover, poorly followed aseptic measures by health care workers, were responsible for development of SSI.

Majority of surgical site infections can be prevented by pre, intra and post operative phases of care. Surgical Site Infections have considerable impact on quality of life of patient. They are associated with considerable morbidity and extended hospital stay. They also result in considerable financial burden to health care providers. Regular surveillance for SSI in the hospital and sensitization of staff regarding consequences of SSI would go a long way in further reduction in the rate of SSI. Rate of SSI was less in cases where surgical suture used for skin closure was vicryl 2.0. Staphylococcus aureus and klebsiella were isolated from microbiological specimens sent for culture and sensitivity. SSI was a cause of concern and stress for patient and relatives

Table 1: Incidence Of Surgical Site Infection (SSI)

Parameter	No of cases (%)
Caesarean section cases without SSI	287 (95.66%)
Caesarean section cases that developed SSI	13 (4.33%)
Total Cases of Caesarean Section	300 (100.0%)

Table 2: Risk Factors Associated With Surgical Site Infection

Risk Factor	Number of Cases of SSI (%) (n=13)
Over Weight/ Obesity	1 (7.69%)
Previous Surgical Scar	6 (46.15%)
Moderate to severe Anemia	2 (15.38%)
Unknown	4 (30.76%)

Table 3: Distribution Of Cases Of SSI In Relation To Type Of Surgical Suture Used For Skin Closure

Type of Suture Material Used	Total Number of Cases (n = 300)	Number of Cases Developed SSI (n=13)	Incidence of SSI in Relation to Suture Material
Ethilon 2.0	93	7	7.52 %
Vicryl 2.0	207	6	2.89 %

Table 4: Micro-organisms Isolated In Surgical Site Infections

Type of Micro-organism	Number of cases of SS (%) (n=13)
Staphylococcus Aureus	7 (53.84%)
Klebsiella	1 (7.69%)
Multiple organisms	1 (7.69%)
Sterile culture	4 (30.76%)

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