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## A study of short term (6weeks) wound complications after caesarean section

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### Abstract

A Study of Short Term (6weeks) Wound Complications after Caesarean Section in 2100 cases of both elective and emergency cases for one year prospective study conducted. The incidence of wound complication in various risk factors like anemia, Chorioamnionitis, obstructed labour, PROM was studied. The impact of duration of operation, type of skin incision and skin closure on wound complication was also noted the antibiotic sensitivity pattern for organisms isolated was also studied. 21 patients out of 378 elective CS had wound complications (6%) where as the number of wound complications were higher in those who underwent emergency CS (13%). 12% of patients developed wound complication with pfannenstiell incision compared to that of 10% with mid line vertical incision. Out of 2080 patients with mattress suture 250 (12 %) had wound complications where as 20 patients with sub-cuticular stitch developed 10% wound complications. 33% of the wound complications were seen in patients aged more than 35 years and 15% were seen between 21-25yrs. The various pathogens isolated by culture in our study are Staphylococcus Aureus, Pseudomonas Spp, Esch. coli, Enterobacter Spp. Few patients had no growth. The commonest organism obtained was Staphylococcus Aureus.

**Keywords:** Caesarean Section, Wound Complications, antibiotic sensitivity, Chorioamnionitis, obstructed labour, PROM

### Introduction

Caesarean Section (CS) is the delivery of the fetus after 28 weeks of gestation through incision in the abdominal wall and the uterine wall<sup>[1]</sup>. The cs incidence increased from 5% to 10% to 30% to 40%<sup>[2]</sup>. This caesarean delivery can cause febrile morbidity infection of the wound and urinary track<sup>[3]</sup>. The wound infections are identified in this study at tertiary care hospital GMH of, Sri Venkateswara Medical College at Tirupati

### Aim and Objective

- To analysis the frequency of wound complication after elective and emergency CS.
- To find out the associate this risk factor at the most common causative organisms in the wound complications and treatment modalities

Joseph Lister, Louis Paster recognized anti sepsis prevents infection<sup>[8]</sup>. The wound infection seen as superficial incisional surgical site infection SSI, deep incisional SSI, Organ / SSI and with signs and symptoms of infection – pain or tenderness, swelling, redness and heat. Least wound infection may have discoloration of tissue in the wound, abnormal smell, friable, bleeding granulation tissue, lymphangitis, with growth of microorganism. The surgical wound can be clean, clean –contaminated and dirty<sup>[4]</sup>. Burke demonstrated that if antibiotics were given before wound contamination, rate of infection decreased<sup>[5]</sup>. Factors associated with wound complications can be categorized as host related or unrelated. Host related risk factors include co-morbidities such as diabetes, Obesity, poor nutritional status, and smoking. Factors unrelated to the host typically involve the perioperative environment: adequacy of skin preparation, preoperative Antibiotics, and postoperative wound care<sup>[6]</sup>.

### Methodology

**Study design:** Prospective observational study.

**Study subjects:** Pregnant women undergone caesarean section both elective and emergency.

**Inclusive criteria:** All the women underwent caesarean section with wound complications at short time of 6 weeks both elective and emergency.

**Exclusive criteria:** Other Post-operative cases like Laparotomy, Hysterectomy. After Caesarean section either emergency or elective with complications like Urinary tract infection and upper respiratory tract infection.

**Study period:** Over a period of 1 year.

Study is carried at GMH, SVMC, Tirupati, from September 2014 to August 2015. GMH is a Teaching hospital and tertiary care center in Tirupati, Chittoor district. All the women enrolled in the study were observed for signs of wound infection till they are discharged from the hospital. Women were asked to come for follow up 1week after discharge. Wound was examined at that time and findings noted. They are again asked to come for follow up at 6 weeks. The hospital policy is to give Inj Cefotaxime 1gm I.V B.D for two days and Inj Metronidazole 500mg I.V TID for two days followed by oral Cefotaxime for 5 days in all cases [7].

If there is H/O PROM, Obstructed labour, Diabetic women [or] any other conditions women susceptible to wound infection, [or] any other condition which needs higher Antibiotics Inj Cefoperazone + Sulbactam is given. Phone numbers are collected from all patients with Wound infection and information gathered about wound healing and counseling given to come for follow up. culture and sensitivity done for all wound infection patients and antibiotics are changing depending on reports [8]. If necessary secondary suturing done and then discharged. Data collected included details of the wound infections, any organisms grown in the cultures, the drug sensitivity of those organisms as well as the risk factors contributing to infections, like obesity, premature rupture of the membranes (PROM), prolonged labour and comorbid medical conditions like diabetes, hypertension and anemia. A *P* value of 0.05 or less was considered statistically significant. Ethical clearance was obtained from the Ethical Committee.

### Results and Observation

Our study included 2100 patients undergoing caesarean section at GMH, SVMC Tirupati during 2014-2015. Number of deliveries during study period 8402, among caesarean section was 2100 and vaginal deliveries were 6302. Caesarian section rate during study period was 25%. The incidence of wound complication in various risk factors like BMI, anemia, chorioamnionitis, obstructed labour, PROM was studied. The impact of duration of operation, type of skin incision and skin closure on wound complication was also noted [9] the antibiotic sensitivity pattern for organisms isolated was also studied.

### Results

#### Incidence of Cesarean Section

In our study period number of deliveries was 8402, among 6302 was normal vaginal deliveries and 2100 was caesarian Section which accounted for 25%.

#### Presentations No of cases %

Normal vaginal delivery 6302  
Caesarian Section 2100 [10]  
Total No of cases 8402 2100 is 25%

#### Incidence

Normal vaginal delivery 75%  
Caesarean section 25%

#### Incidence of Wound Complications

In our study of 2100 patients, 252 cases developed wound complications which accounted for 2%.

#### Type of Wound Complications

The various types of wound complications seen in the present study are superficial wound infection; Superficial wound break down, and hematoma with out infections. The commonest wound complication was superficial wound infection (58.4%). None of the patients developed fascial dehiscence [11].

#### Age Distribution

33%of the wound complications were seen in patients aged more than 35 years and 15%were seen between 21-25yrs.

#### Type of Caesarean Section

Out of 2100 patients included in the study, 378 underwent elective CS and 1722 underwent emergency CS. Table 11 represents number of wound complications in both elective and emergency CS. 21 patients out of 378 elective CS had wound complications (6%) where as the number of wound complications were higher in those who underwent emergency CS (13%).

#### 12: Risk Factors

The various risk factors which contributed to the wound complications in this study are PROM (24%) anemia (17%), hypertension (10%), diabetes mellitus (9%), more than half of those with obstructed labour and Chorioamnionitis developed wound complications (70 & 56% respectively) [13].

#### 13: Type of Incision

12% of patients developed wound complication with pfannenstiell incision compared to that of 10% with mid line vertical incision.

#### 14. Duration of Operation

When the duration of operation was more than 60mins, 60% of patients developed wound complication as compared to 31% and 9% with the duration of operation between 45-60 min and less than 45min respectively.

#### 15. Type Skin Closure

Out of 2080patients with mattress suture 250 (12 %) had wound complications where as 20 patients with sub-cuticular stitch developed 10% wound complications.

#### 16. BMI of the Patient

It can be seen from table 16 that the rate of wound complications was almost similar in those with underweight, average weight and overweight patients (BMI19-30).

Whereas the rate of wound complications increased significantly in obese patients (BMI>30). Though the numbers was small, 7 out of 28 from obese patients had wound complication and the all patient morbidly obese developed wound complication

### 17. Duration of Hospital Stay

The average hospital stay for woman with no wound complication was 7 days. In those woman who had wound complication, 119 patients of them stayed for >15 days and 14 patients stayed for >21 days. Thus wound complication increased the hospital stay by an average of 7days.

### 18. Most Commonly Isolated Organisms

The various pathogens isolated by culture in our study are Staphylococcus Aureus, Pseudomonas Spp, Esch. coli, Enterobacter Spp. Few patients had no growth. The commonest organism obtained was Staphylococcus Aureus.

### 19. Management of Wound Complicated Cases

Out of 252 wound complicated cases, 30 patients underwent re-suturing and other 222 patients were treated with daily dressings and antibiotics depending on culture sensitivity report. All these treated patients discharged at the end of the hospital stay Without further problems.

**Discussion:** The current study was done with 2100 patients with both elective and emergency Caesarean section during 2014-2015 at GMH, SVMC Tirupathi In our study all infected cases noted, Infection at the surgical site within 30 days which is one criteria for definition of wound infection according to study Fathia *et al* Jama [14]. The most common type of wound complication found in our study was superficial wound Infection. In our study superficial wound infection is 58.4% deep infection 36%. Whereas study conducted by Túlio Cícero Franco Farret (2012) superficial wound infection is 70.9%deep infections is 12.6%. [14] *et al* The wound complication rates after caesarean section vary from 3-16% reported in literature, the incidence of wound complications in present study was 12%.The study conducted by A.R. Mahal *et al* (2008), Study conducted by Fathia E. Al Jama *et al* (2007) [15] showed an incidence of 8.6%.

The overall rate of post-operative infection was 4.2 % The Study conducted by TA Jido *et al*, (2003) wound infection rate was 8. In a study by Pelle H *et al*, (2011) [16] reported that the an incidence of 6.6% and study by Santyanarayana the overall rate of post-operative infection was 12.4 % comparable to your study common, diagnosed by discharge from wound, wound culture, symptoms of infection accompanied by deliberate opening of the wound noted. Superficial wound infection was 58.4%, Superficial wound breakdown was 36%. In our study elective and emergency caesarean section show difference in overall wound complication rate, incidence of wound complications in elective caesarean section was 6%which is less compared to emergency caesarean section (13%), the study conducted by Pelle H *et al* (2011) [17]. wound complications in elective Is Caesarean section was 3.8%which is less compared to emergency caesarean section 7.5% comparable to our study. Wound complication rate in emergency caesarean section almost double compared to elective caesarean section in both studies. Mahale study (2008) which showed chorioamnionitis (60%), obstructed labour (76%), PROM (20.8%) and anemia (22%). In the present study Obstructed labor (70%), Chorioamnionitis (56%), significantly increased the wound complication rate in comparison with other variables which were similar to the results given by AR Mahale *et al*, (2008) [17]. In the current study it can be seen that the rate of wound complication was almost similar

in those with underweight, average weight and overweight patients (BMI19-30).The rate of wound complications was 25% in obese patients (BMI>30) and all patient in our study who was morbidly obese (BMI>40) developed wound complication. In the study by AR Mahale [17], The average hospital stay for woman with no wound complication was 6 days, woman who had wound complication stayed for 14 days. The average hospital stay increased by 7 days in wound complicated cases. The average hospital stay for woman with no wound complication was 7 days. The present study the average duration of hospital stay for women with no wound complications was 7 days and women with wound complications stayed for more than 15 days which increased by 8 days. The study of Fathia E. Al Jama *et* infection the mean hospital stay in the present study was 4 days longer in the patient group compared to the control. In the present study 75% of patients had wound complications, when the duration of operation was > 1hr compared to 31% and 9% whose duration of operation was between 45 – 60 min and less than 45 min respectively Thach son TRAN *et al* (2000) [18] also reported that caesareans that lasted longer than 1 hour that longer the duration of operation increases the risk of postoperative wound complications. Study done by Devjani D *et al* (2011) had significant p- value [19, 11] all wound and Habib FA *et al* (2000) [20]

### Conclusion

- Study was aimed to know the incidence of wound complications, associated risk factors, causative organisms and management of Caesarean section has become one of the commonest surgical procedures in obstetric practice. The incidence of section rate is 25% in our hospital as it is tertiary hospital and referral center. The incidence of wound complications after caesarean section in this study was 12%.
- Study confirms that risk factors like anemia, DM; PROM, HTN, increased surgical time, increase BMI poses risk for wound complications. Whereas chorioamnionitis (56%) and obstructed labour (70%) showed increased risk for wound complications.
- Wound complications increased the duration of the hospital stay, which again increased the extra financial burden both to the patients and the Hospital. As longer the duration of operation increases the risk of postoperative wound complications
- The most common organism isolated was staphylococcus aureus. Next common organism was pseudomonas.
- Superficial wound infection was the commonest wound complication which was treated by daily dressing and antibiotics. Whereas in 36%wound break down Resuturing was done.
- Correcting malnutrition, anemia, stabilizing diabetes and eradicating all infection such as urinary tract infection, proper preparation of skin, proper surgeons scrubbing, and using proper surgical technique can decrease the risk of post operative abdominal wound infection.
- Knowledge of these risk factors would help the obstetrician in avoiding these complication and help to decrease the maternal morbidity post operatively.
- Prophylactic antibiotic in proper time and dose decrease post operative wound complications.

- Based on the sensitivity pattern of different isolates of bacteria, an empiric antibiotic therapy in post caesarean infection can be implemented.

### Summary

- Study is carried at GMH, SVMC, Tirupathi, Chittoor district from September 2014 to August 2015. GMH is teaching hospital and tertiary care center.
- The incidence of post-caesarean wound complications was 12% higher than the average of about 6%.
- The commonest type of wound complication was superficial wound infection (58.4%).
- The risk of wound complication was more in emergency LSCS (13%) compared to elective LSCS (6%).
- The various risk factors which accounted for wound complications are anaemia (17%), hypertension (10%), DM (9%), obstructed labour (70%), chorioamnionitis (56%) and PROM (24%).
- Chorioamnionitis and obstructed labour significantly showed increased risk for wound complications.
- The risk of wound complication was higher with increase in BMI. 25% with BMI of more than 30 and 100% in BMI of more than 40.
- Midline vertical incision (12%) showed equal incidence of wound complications compared to pfannenstiell (10%).
- Wound complication rate was no difference between mattress type of skin closure and subcuticular stitch.
- Increased duration of operation increased the risk of wound complications (60% in patients with more than 60 min of procedure).
- Wound complications increased duration of hospital stay by 7days.
- The most common organism obtained was Staphylococcus aureus. (47.2%), next common organism was Pseudomonas (19.4%). Whereas in 16.7% no growth of organisms.
- There are three main aspects to prevention of infection (1) Careful, gentle and neat surgery (2) Reduction of contamination during and after surgery and (3) Support of the patient's defenses, including use of prophylactic antibiotic whenever necessary.
- The standard approaches to decrease the risk of post-operative abdominal wound infection include limiting the duration of pre-operative hospitalization when possible, correcting malnutrition, anemia, stabilizing diabetes, decreasing steroids or immunosuppressive agents if possible, eradicating all infection such as urinary tract infection, proper preparation of skin, proper surgeons scrubbing, limiting operating room ventilation and air flow and using proper surgical technique.

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