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A Prospective Clinical Study on Incidence of Postoperative Wound Complications Following Obstetrics and Gynaecological Surgeries

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Abstract: ***Aims and objectives: To find out the incidence of post operative wound complications among the obstetrical and gynaecological surgery and to identify risk factors and study preventive aspects. Materials and methods: This is a prospective observational study of all the patients with wound infections following operations done for any obstetric or gynaecologic cause. Results: Incidence of post operative wound complication following obstetrics and gynaecology surgery was 8.9% among 1029 surgeries performed during study period. Out of 1029, 92 patients have developed postoperative wound complications. Wound dehiscence is most common complication in our study and classified as per class of SSI. Most of the patients in our study were from age group 21 - 25 years (34.7%). Mean age was 37.4 years. Caesarean section was done in 44.6% cases, while abdominal hysterectomy was done in 29.3% cases.20.7% cases had laparotomy and 5.4% had tubectomy. According to wound fortification technique, secondary suturing was done in 34 cases while drain was used in 2.2%. Staphylococcus aureus being the mostcommon isolated organism from wound specimen. Incidence of wound complication was 6.3% in LSCS cases and 11.8% in hysterectomy cases. Conclusion: Incidence of wound complications in our study was 8.9%. Since LSCS and hysterectomy are the most common operation done, the wound complication rate is also high (6.3% in LSCS cases and 11.8% in hysterectomy cases). Most of the wound complications in our study was wound dehiscence i. e superficial skin gaping (according to SSI classification). Anaemia being the most common predisposing factor. Surgical site infections can be prevented by proper pre - operative assessment of cases, strict compliance with scrubbing and donning protocols, skillful surgery, avoiding overcrowding in operation theatre and post operative wards and by maintaining conducive theatre environment.***

Keywords: Antibiotic prophylaxis, Anaemia, Surgical site infections (SSI), SSI surveillance, Wound dehiscence

1. Introduction

Surgical site infections continued to be the reason for major complications for the patients underwent surgical procedures in spite of advances in operative techniques and having knowledge about pathogenesis of wound healing [1.] The (CDC) Centres for Disease control defined SSI as “an infection related to an operative procedure that occurs at or near the surgical incision within 30 days” [2].

Surgical site complications is the most significant and being the reason for raising morbidity, due to high antimicrobials usuage, more redo surgeries, and duration of hospital stay and intensive care unit, thus contributing to increase in treatment costs and increasing resource utilization [3.] Surgical site infection being the most common infections following gynaecological procedures. Increased risk of post operative infection occurred following operative procedures like abdominal and vaginal hysterectomies and caesarean section in obstetrics and gynaecological procedures. Women delivered vaginally has less infection rate compared to women delivered by caesarean section (2 - fold - 20 - fold) [4].

Analysis of the reliable hospital data will help to determine the factors responsible for SSI in thereby will help in preventing them. With this in mind this study was undertaken at Srinivas university of medical sciences, Mukka, Surathkal during a two year study period.

2. Materials and Methods

This is a prospective study conducted on patients admitted and operated in Department of Obstetrics and Gynaecologic surgeries in SIMS, Mangalore, or referred from outside for wound care to our hospital. Study group patients were observed postoperatively for any development of wound infections or complications that required wound debridement or secondary suturing or negative pressure dressing, or relaparotomy were included after taking informed consent.

A detailed history was taken from the women included in the study. The study subjects were taken detailed history regarding their age, parity, BMI, diet, socioeconomic status. In case of caesarean section, detailed history regarding, indication of surgery, elective or emergency, parity, age, BMI, haemoglobin status, ANC history, drug history, any Prolonged PROM, any comorbidities history, previous operative and present operative findings, previous scar status, and other complications associated with pregnancy noted.

Patients planned for major or minor gynaecological elective surgery were admitted 3 days or 1 day prior to date of operation respectively. Complete physical examination was done out to rule out any local or systemic infections. Blood and serological investigations were performed as prerequisite for anaesthesia. Abdominal wall shaving done on previous night.

A single dose of prophylactic antibiotic half hour before on the day surgery was advocated. Surgery usually starts at 9:

30 am in the morning. Intraop Skin was painted with Povidone iodine solution (10%). After surgery, abdominal wall was closed in layers. Rectus sheath was closed with (Vicryl 1) delayed absorbable suture material and skin was closed by Monocryl 3 - 0 RC or vicryl 1 RB, In Vertical incision, skin closed with ethilon 0 or staplers. Antibiotics would be continued for 1 to 2 days and then same drugs by oral route for next 7 days.

Post - surgery patients were given analgesic drugs as per individual need and adequate hydration assured. Along with antibiotics, all cases received anti - inflammatory drugs from 2nd to 5th Postop day. Bladder was catheterized for 24 hours.

Early ambulation was advised for our patients. Patients encouraged to accomplish deep breathing exercises and lower limb movements in bed. Patients were observed for clinical or bacteriological evidence of post operative wound complications like (pain, discharge - serous or blood stained, tenderness or erythema at surgical site, wound dehiscence, etc). The criteria used for Wound dehiscence – Separation of edges of suture line - superficial or deep or complete abdominal wall (Burst abdomen) as per CDC guidelines.

The duration of hospital stays, and status of wound outcome was noted. Data based on age, BMI, associated predisposing factors, indication and nature of surgery - emergency or elective, route and technique of surgery, and anaesthesia, surgical site infections, duration of hospital stay, wound related complications were collected**.**

3. Results

Incidence of post operative wound complication following obstetrics and gynaecology surgeries which was 8.9%. Of the total 1029 cases included in the study, 92 developed wound complications. Most of the patients in our study were from age group 21 - 25 years (34.7%). Mean age was 37.4 years while mean duration of stay was 18.4 days. Mean haemoglobin was 10.5 g/dl. According to BMI distribution, underweight were 23.9%, while normal BMI were 60.9%, overweight accounted for 12% and 3.30% patients belonged to class 1 obese. Elective surgery was done in 54.3% cases, emergency surgery was done in 45.7% cases. Incidence of caesarean section having postoperative wound complications was 6.3% and abdominal hysterectomy was 11.8%. In our study transverse incisions contributed to 58.7% since majority of operations done were caesarean section among study group. The routine use of ceftriaxone alone for caesarean deliveries and cefosulbactam for gynaecological procedures was found not to be effective in preventing postoperative wound infections which could have been prevented by addition of Metrogyl. Most of the wound infection in our study occurred between 5th and 6th POD Monocryl 3 - 0 RC needle when used for subcuticular skin closure has less infection rate comparable to vicryl 1 - 0 round body, similarly in gynaecological surgeries skin closure with staplers had no wound complications compared to ethilon mattress skin closure. In our study anaemia was the most common predisposing factor contributing to wound complications followed by underweight, chronic cough, diabetes mellitus. Most cases of wound dehiscence in caeserean section in our study occurred in cases of emergency indications. In our study among 92 study group, 2 patients developed deep incisional SSIs for whom vacuum dressing followed by secondary suturing gave a better outcome Among 92 patients, 58 patients have superficial skin gaping, for whom regular dressing with wound debridement with betadine and normal saline. wash, topical antiseptic application provided good results, where as 32 patients have dehiscence up to subcutaneous layer for whom regular dressing with step up antibiotics according to culture sensitivity report, local gentamycin injection with secondary suturing gave a best outcome. Appropriate statistical software, included but not restricted to MS Excel, SPSS ver.20 was used for statistical analysis.

Table 1: Distribution according to primary operative procedure

Primary Operative procedure	Number	Percent	Total number of patients
Lower Segment Caesarean Section	41	44.60%	654
Abdominal hysterectomy	27	29.30%	227
Laparotomy	19	20.70%	112
Tubectomy	5	5.40%	36
Total	92	100.00%	1029

Table 2: Distribution according to pre disposing factors

Predisposing factors	Number	Percent
Anemia	23	25.00%
Chronic cough	16	17.40%
Pulmonary bronchitis	10	10.80%
Abdominal distension	9	9.70%
Diabetes mellitus	12	13.00%
Underweight	19	20.60%
Overweight	3	3.20%
Total	92	100%

Table 3: Distribution according to incision

Incision	Number	Percent
Pfannensteil incision	21	22.80%
Transverse incision (suprapubic) (caesarean sections, hysterectomies)	54	58.70%
Vertical infraumbilical midline incision (in cases of laparotomy, large tumors, tubectomy)	17	18.50%

Table 4: Distribution according to treatment of surgical site infection (SSI) dehiscence as per class of SSI

Class of SSI	Treatment	Number of cases of SSI	Percent
Superficial incision SSI (Superficial skin gape)	Regular dressing	58	63%
Superficial incisional SSI (Dehiscence upto subcutaneous layer)	Secondary Suturing	32	34.70%
Deep incisional SSI (involving deep tissues)	Vaccumdressing+Secondary suturing	2	2.30%
Organ Space SSI (Burst abdomen)	Resuturing, Debridement + Resuturing, Mesh application	0	0%
Total		92	100%

4. Discussion

All surgeons strive to perform operations as efficiently as possible without complications and harm to the patient. However, inspite of all efforts, complications can occur with surgery that effect prognosis. The results obtained in study are discussed as follows.

In our study 1029 cases participated among which 8.9% were having post operative wound complication. Incidence of post operative wound complications was 8.9%. Our study focused on surgical site wound complications only, general postoperative complications like UTI, anaesthesia related complications, febrile morbidity, thromboembolism, ureteric and bowel injuries, paralytic ileysetc have not been included in our study.

[5]Chia et al in their study on A survey of postoperative wound infections in 150 of 6639 cases was conducted at KandangKerbau Hospital, Singapore over a period of 12 months, with an overall incidence of wound infection of 2.26% and an incidence of cesarean section wound infection reported that it was 2.29%. The surgeries with the lowest rates of wound infection were laparoscopic and sterilization procedures. Radical and extended hysterectomies have the highest rates of infection.6James et al. Their study reported an incidence of wound infection of 2.3%. Pandit et al in their retrospective study carried from March 2002 to January 2003, reported the incidence of 2.76%[7].

Incidence of post - caesarean wound infection reported by Piret et al. in his cross - sectional study at the Obstetrics and GynecologyCenter of Tertiary Care, incidence found to be 6.2% [8]. According to Demisew et [al.9], his postoperative wound infection rate in his prospective study of 770 women from April 2009 to March 2010 was 11.4%. Infection rates after caesarean section were higher than after hysterectomy. In the present study, the overall incidence of wound infection was 8.9%, of which incidence of wound infection in LSCS (6.3%), followed by abdominal hysterectomy (11.8%) and the incidence of wound infection being least in tubectomy surgeries.

Wound infection is one of the most common postoperative complications in septic wounds and causes significant morbidity. In our study prevalence of wound complications was 8.9% and also 8.9% cases (either elective or emergency). In study by Singh etal 65overall prevalence of complications that required intervention was 2.14% (29 out of a total of 1356 surgeries) which was low as compared to our study. The prevalence of common surgical complications associated with gynecological and obstetric procedures is low compared to studies by Ortiz - Martínez et al., [11]and Erekson et al., [10], with a prevalence of 3.8%, and 3.7% respectively. In a study by Ibrahim et al in 212 patients, there's are only 5cases with the rate of septic injury (2.4%). According to data published by (Dicker et al., 1982) [12] the incidence of wound infection was 5%, and recent figures (Siddiqua et al., 2016) [13] suggest that the incidence of wound infection is the same where the decreased percentage in wound infections noted. However, Bahadur et [al14] reported a much increased prevalence of these complications of around 24.16% in their study. The difference between these outcomes was that minor and major complications after obstetric and gynecologic procedures such as fever, respiratory infections, shock, and surgical complications were all included, whereas in our study only surgical site wounds complications were included. . Wound dehiscence (Superficial incisional SSI acc to SSI Classification) is most common complication in our study similar to study done by VidyadharBangal et al [84]. Anaemia was the major and most common pre disposing factor in our study contributing to 23 cases (25%) followed by underweight (19, 20.6%) then chronic cough (16, 17.4%) and post operative pulmonary bronchitis contributing to 10 (10.7%) of the cases.

In contrast to our study, Awan et al.1[5]did not observe anaemia as a predisposing factor of surgical site infection while in our study anaemia was most commonly seen (26.4%) cases. In his study 4 RTI cases with a percentage of 1.9 percent were developed which was low as compared to our study. These results were also contrary with a study by (Siddiqua et al., 2017) [13] that reported 3 RTI cases from 100 cases with a percentage of 3%. .5Among 150 patients of wound infections reported by Chia et al. When examined, 22.8% showed no bacterial growth in the wound discharge sent for culture and sensitivity, and 77.2% of the cultures were positive for bacterial growth.

Among the pathogens, Staphylococcus aureus was isolated in 58.1% of cases, of which 49.5% were methicillin - susceptible Staphylococcus aureus and 8.6% were methicillin - resistant Staphylococcus aureus. This was followed by Streptococcusspp. (10.5%) and Klebsiella (9.5%). Majority of these organisms showed susceptibility to cloxacillin. Shittu et al. reported that in his study of 120 cases at a Nigerian University Teaching Hospital, 62% were culture - positive cases in wound discharge [16]. Of these 62% cases, 38.23% were monomicrobial and53.92% were polymicrobial. Staphylococcus was the predominant isolate in 25% of cases, followed by Escherichia coli in 12%, Pseudomonas aeruginosa in 9% and S. epidermidis in 9% of cases. In the present study, wound culture report showed bacterial growth in 87% cases. Out of those showing bacterial growth, Predominant micro - organism isolated was staphylococcus aureus in 39% cases, klebseilla in 3%, E. coli in 25%, pseudomonas aeruginosa in 15%, CONS in 4%, Staphylococcus being sensitive to pencillin and cephalosporin group.

5. Conclusion

Preoperative complete evaluation of the patients, getting physician opinion for gynaecological procedures, improving haemoglobin status prior surgery, improving nutritional status, explaining the patient personal hygiene, early ambulation, and motivation support to the patients yields a better outcome.1 Anaesthesia opinion, choosing the correct choice of induction, preoperative antibiotic, parts prepation, foleys catheterization under aseptic precautions, proper painting and draping of the patients are few general measures. In the operation theatre, following surgical safe checklist, which includes, identification of patient procedure and site of surgery, sterilised instruments, giving pre op antibiotics as per the recommendation, anticipate the

complications and outline strategy to prevent them. Proper postoperative care, adequate analgesics, fulfillment of metabolic needs, hydration, antibiotics, starting drugs for comorbidities if any, early ambulation, and monitoring of patient for development of any complication is important[17]

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