SURVEILLANCE OF SURGICAL SITE WOUND INFECTIONS AFTER GYNAECOLOGICAL AND OBSTETRICAL SURGERIES IN A TERTIARY CAREHOSPITAL

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Abstract

Objective: To determine the incidence of surgical site infections, the surgical procedure preceding it, its indication and the pathogenic organism involved in all the gynecological and obstetrical surgeries performed during the study period.

Methodology: This descriptive cross sectional study was conducted at Gynae B unit of Mardan Medical Complex, Mardan from Jan 2019 to July 2019.All women of any age or parity who underwent surgery during the study period were followed after the surgeries to observe whether they develop wound infection. Those whose wounds got infected were enrolled. The discharge from the wound was collected on proper swab stick, and sent for culture and sensitivity to the laboratory. The reports ofculture were followed and recorded.

Results: Out of the 642 women enrolled, 58 had wound infection. The incidence of surgical site infection was 9%.32(56%) had caesarean sections and 26(44.8%) had gynecological surgeries.23 (39.6%) were emergency and 9(15.5%) were elective caesarean sections. Most common indication for caesarean was repeat caesarean in 12(37.5%) followed by fetal distress in 10(31%) subjects.11 (19%) were abdominal hysterectomies,8(14%) were laprotomies,4(6%) were vaginal hysterectomies and 3(5%) were AP repairs.38(65.5%) had superficial,14(24%) had deep wound infection and 6(10%) had organ/space infection. The commonest pathogen isolated was S.aureus in 17(29%), followed by E.coli in 9(16%),P.aeruginosa and S.epidermidis in 4(7%) each.

Conclusion: Surgical site infections are more commonly seen in abdominal surgeries. Staphylococcus aureus and E.coli are themicroorganisms more commonly involved.

Keywords: Comorbidity, Surgical Site Infection, Obstetric Surgery, Caesarean Section, Microorganism, Gynecological Surgery

INTRODUCTION

Postoperative surgical site infections (SSI) are hospital acquired infections and certainly is an important cause of postoperative morbidity [1].They can involve tissues, cavities or organs which are handled in surgical procedure and makes 14% to 16% of all infections [2].Incidence of SSIs is 0.5% to 15% depending on the type of surgical procedure performed and mostly there are procedure and associated risk factors which are involved in causation [3].

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The Centers for Disease Control define SSI as " an infection related to an operative procedure that occurs at or near the surgical incision within 30 days"[4].Age,malnourished patient, medical disorders like uncontrolled diabetes, smoking, infectious status, smoking, altered immune status, malignancy and long stays in preoperative period are risk factors for surgical site infections [5].Other factors being site preparation, scrubbing of staff before surgery, surgical time, surgical technique, operation theatre disinfection, processing of OT materials, in the course of surgery [6].

Postoperative infection is also responsible for causing extra financial burdens on hospital and patient due to more antibiotic administration, more reoperations, lengthy stay in hospital, increased susceptibility to get admitted in ICU and increasing treatment costs [7]

The prevalence of SSI following gynecological procedures was greatest for

abdominal hysterectomy (3.3%) followed by gynecological laparotomy (1.3%)[8]. Patients who develop SSI are twice at risk of death
,60% are at risk of getting shifted to ICU, and more than five times likely for readmission to the hospital [9].Microorganisms responsible for causing postoperative wound infections can be endogenous(a patient's internal
Flora causes the infection) or exogenous (the infection is caused by microorganisms acquired from the hospital environment) [10]

The aim of this study is to determine the incidence of postoperative wound infections in obstetrical and gynecological surgeries along with their indications and causative organisms.

MATERIALS AND METHODS

This descriptive (cross sectional) study was conducted in Gynae B unit of Mardan Medical Complex, Mardan from January 2019 to July 2019.All the Patients were admitted from emergency or Outpatient Department. Consecutive nonprobability sampling technique was employed. Women of any age or parity, who underwent any type of elective or emergency obstetrical or gynecological operative procedure in Gynae B unit were included. Women who were not willing to participate, had caesarean section elsewhere, were giving history of any type of skin allergy, or surgical site infection prior to study period, steroid intake by any route of administration, history of diabetes, body mass index more than 27 were excluded.

Hospital ethical committee was consulted for approval of the study. All the subjects were given a short briefing about the purpose of our research and informed consent was taken. After assessing the patients and taking the proper history related to past, medical and surgical, clinical examination including systemic examination along with vital parameters. A detailed preform for the collection of data pertaining to patients in this study was prepared and patients were included as per the inclusion and exclusion criteria, which included demography, educational status, indication of surgery, elective or emergency procedure, nature of wound infection i.e., superficial, deep or organ/space, any known risk factors in that specific patient and details of follow up at seven days and then at fifteen days. The patients whose wounds were infected on follow up were either readmitted depending on status and severity of infection or advised outdoor dressing. Proper wound Swab was taken under aseptic conditions for microbial evidence and sent to hospital laboratory for culture and sensitivity. All the subjects
Were asked to come for follow up. Culture and sensitivity report was recorded when available.

The collected data was analyzed using SPSS 20.0.Mean and standard deviation were calculated for quantitative variables whereas frequency and percentages were calculated for qualitative variables like type of surgery, indication of surgery, nature of wound infection and involved organisms. All data was presented in the form of tables.

RESULTS

In the study period, 642 surgical procedures were performed at Operation Theatre of Gynae B unit, Mardan Medical Complex.58 patients were found to have infected wounds. The incidence of wound infection was 9%.

32(56%) women had caesarean sections and 26(44.8%) had gynecological surgeries. Out of the caesarean sections, 23(39.6%) were emergency and 9(15.5%) were elective. Regarding the gynecological procedures, 11(19%) were abdominal hysterectomies,8(14%)were laprotomies,4(6%) were vaginal hysterectomies and 3(5%) were AP repairs.(Table no.I)

38(65.5%) patients had superficial wound infection, 14(24%) had deep wound infection and 6(10%) had organ/space infection.

The wound swabs of patients were followed and it was found that Staphylococcus aureus was the most commonly found pathological organism, seen in 17(29%) subjects. This was followed by E.coli in 9(16%), Pseudomonas aeruginosa and Staphylococcus epidermidis in 4(7%) for each, Proteus mirabilis and Enterobacter in 2(3%) for each, polymicrobial growth in 6(10%) and no growth in 14(25%) specimens.(Table no.II)

NATURE OF SURGERY	FREQUENCY	PERCENTAGE
Emergency	34	59%
Elective	24	41%
SURGICAL PROCEDURE		
Caesarean Section	32	56%
Abdominal Hysterectomy	11	19%
Laparotomy	8	14%
Vaginal Hysterectomy	4	6%
AP Repair	3	5%
NATURE OF ANESTHESIA		
General	28	48%
Spinal	30	52%
PAST SURGICAL HISTORY		
Insignificant	39	68%
Significant	19	32%
LENGTH OFSURGICAL PROCEDURE		
Less than 45minutes	14	24%
More than 45 minutes to 3hours	44	76%

TABLE NO.I: INCIDENCE OF POSTOPERATIVE INFECTION INVARIOUS SURGERIES (n=58)

TYPE OF SURGERY	FREQUENCY	PERCENTAGE
Caesarean Section	32	56%
Abdominal Hysterectomy	11	19%
Laprotomy	8	14%
Vaginal Hysterectomy	4	6%
AP Repair	3	5%
Total	58	100%

TABLE NO.II: PATHOGENIC ORGANISMS INVOLVED (n=58)

PATHOGEN	FREQUENCY	PERCENTAGE
Staphylococcus aureus	17	29%
Eschericia Coli	9	16%
Pseudomonas aeruginosa	4	7%
Staphylococcus epidermidis	4	7%
Proteus mirabilis	2	3%
Enterobacter	2	3%
Polymicrobial growth	6	10%
No growth	14	25%
Total	58	100%

DISCUSSION

Surgical site infections negatively affect the image of a health care facility. They limit the potential benefit of a surgical intervention and lead to a significant increase in morbidity, length of hospital stay and health care costs 6. World Health Organization recommends that national rates of postoperative wound infections should not exceed 10 to 15% 16The present study reports an incidence of 9% surgical site infections for both obstetrical and gynecological surgeries. Babu BG et al in their study at a rural tertiary health care facility reported the same incidence 11.Similarly another study from Tanzania reported 10.9% SSI rate 12.

Caesarean section was the most common surgical procedure preceding surgical site wound infections in our study comprising 32(56%) surgeries. This finding was in accordance with the research conducted by Awan MS et al who reported 51% of their surgeries being caesarean sections 13.Out of the caesarean sections, emergency caesareans were more common (39.6% versus 15.5% elective).Shan Bhag et al also concluded in their study that emergency caesarean sections are more commonly involved in SSI as compared to elective caesarean sections 10.

Abdominal hysterectomy was the most common gynecological surgical procedure leading to SSI.11(19%) cases had infected wound. Tayade S et al in their study in 2019 also reported abdominal hysterectomy as the most vulnerable gynecological operative procedure for SSI 6.Laprotomies including exploratory, ectopic, BTL comprised 14% of our SSI, whereas they were responsible for causing 2.7% cases of SSI in another study 6. Superficial surgical site infection involving only skin and subcutaneous tissue comprised of 65.5% of our cases, similar to study of Jadoon S et al in 2017 in Mardan medical complex 14.24% of our SSI were deep involving muscles or rectus sheath, Tayade S et al reported this figure to be 6.25 % in their study as almost rest all of their wounds were superficial surgical site infections 6.Jabbar S et al also recorded superficial type of infections in 51% of their subjects 17.

Confirmation of the involved organisms lead to quick recovery as well as less expenditure on antibiotics. Staphylococcus aureus was the predominant pathogen which was found to be present on the culture. It was the pathogenic organism isolated in 31% of specimens in another study 11,12.S.aureus being the commonest cause of hospital acquired infections and it was seen as the principle pathogen observed by Safi FN et al in 24% cases 15, usual source of infection from this organism being patient's own flora or exogenous source. But according to Shan bhag ER et al,E.coli was the predominant organism and S.aureus accounted for only 4.69% 10.Pseudomonas aeruginosa accounted for 7% SSI in our study whereas it was responsible for 24% infections in another study 11.

In our study, there were several limitations like there was no standardization in the performance of surgeries in accordance with the qualification of surgeon ,variable

preoperative preparation and intrapartum events prior to caesarean section

CONCLUSION:
Surgical site wound infections were more common in abdominal surgeries,especially those done in emergency. Superficial wound infections were commonly observed in our study and Staphylococcus aureus was the observed organism in most of the cases followed by E.coli. Infected wound rate in our study is in accordance with the range provided by WHO but efforts should be done to reduce the rate further and thus prevent sepsis.

CONFLICT OF INTEREST:

None.

AUTHOR'S CONTRIBUTION:

Conception of study, Data collection: Dr. Maimoona Qadir Analysis/Interpretation: Dr. Naila Bukhari
Critical Review: Dr. Fauzia Afridi

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