Original Article

To Determine the Frequency of Post Caesarean Wound Infection in a Tertiary Care Hospital

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Abstract

Objective: To determine the frequency of postcesarean wound infections in a tertiary care hospital.
Methodology: This descriptive cross-sectional study was conducted at Department of Gynaecology and Obstetrics, Mardan Medical Complex, Mardan from 1st July 2016 to 31st December 2016.All patients who underwent cesarean section during the study period were followed for development of wound infection. The patients, who developed wound infection, were enrolled. Their pus/tissue fluids were collected sent for culture and sensitivity and then reports were followed.
Results: Out of the 392 patients recruited, 47(12%) developed wound infection. The most prevalent age group was 26-35years (49%) while gestational age was 36 -40 weeks in 19(40%) cesareans. 22 (46%) of women were illiterate.20 (42.5%) belonged to rural areas and 22(47%) were para 2-5. Pattern of wound infection seen in our study was superficial incision infection in 30 patients (63.8%), deep incision infection in 13 patients (27.6%) and organ/space infection was in 4 patients (8.5%). Staphylococcus aureus was most common pathogen isolated in 15(32%) followed by Escherichia coli in7 (14.8%) cases.
Conclusion: Rate of wound infection is in the range of WHO recommendation but efforts should be done for infection prevention to reduce the risk of wound sepsis.

Keywords: Cesarean section, Surgical Site Infection (SSI), Risk factors, Antibiotic, Risk Factors.

Cite this article as: Jadoon S. Khan SM, Qadir M, Amir S. To Determine the Frequency of Post Caesarean Wound Infection in a Tertiary Care Hospital.J. Soc. Obstet. Gynaecol. Pak. 2017; Vol 7(3):114-118.

Introduction

Cesarean section is a major obstetrical operative procedure which aims to save the lives of fetuses and mothers.[1] The incidence of cesarean sections has risen over the last few decades, with an estimate being 22.9 million caesarean sections in 2012. [2, 3] Caesarean section carries immediate as well as long-term risks. Wound infections indicate the quality of surgical care provided and range from minor wound discharge, poor scar and persistent pain to major life-threatening complications like sepsis.[4, 5]

Worldwide the rate of post cesarean wound infection ranges from 3% to 15%. [6-8] This wound infection may increase maternal morbidity and mortality. [9, 10] The Center for Disease Control and Prevention (CDC)

Authorship Contribution: [1] Concept and Idea, Data collection, Methodology, literature review, final approval and authored the study,[2,3,4] Data collection, Data analysis, assisted in drafting the work, critically revising the important intellectual contents and reviewed the study. All authors accept the responsibility for the article in the present form.

Funding Source: none
Conflict of Interest: none

Received: Mar 11, 2017
Accepted: May 17,2017

describes three levels of wound infection, superficial incision, deep incision, and organ or space infection.[11]

Postoperative wound Infection should be prevented through adequate measures like antisepsis, preoperative preparation, reduction in the blood loss, duration of surgery, use of absorbable sutures and avoiding cross infections. [12-14] Studies have identified many major risk factors leading to post cesarean wound infections. They are obesity (BMI >25) diabetes mellitus, chorioamnionitis, procedure related blood loss, long duration of surgery, multiple procedures, manual removal of placenta, young maternal age, maternal preoperative condition, absence of antibiotic prophylaxis and low socioeconomic status.[15-18]

The rationale of our study was to find out the frequency of post cesarean wound infections so that early detection can help in reducing maternal morbidity, medical cost, readmission rate and hospital stay. A huge percentage of wound infections arise from preventable causes which if addressed would significantly reduce rate post cesarean wound infections.

Methodology

This descriptive study was conducted at the Department of Gynaecology and Obstetrics, Mardan Medical Complex Teaching Hospital, Mardan, KPK from 1st July 2016 to 1st January 2017. Sample size was 392 and patients were admitted through emergency or outpatient department. Consecutive non probability sampling technique was used. All women aged 18 to 45 years regardless of parity having gestational age between 32 to 42 weeks, delivered by caesarean section elective as well as emergency, regardless of the booking status or indication of cesarean section were included in our study. Women who underwent cesarean section elsewhere and were then transferred to this hospital, those who refused consent, history of skin allergy or surgical site infection prior to the study period, history of malignancy, steroid intake, diabetes Mellitus and body mass index (BMI) >27 were excluded from the study.

Approval was taken from the hospital ethical committee. The patients were informed about the purpose of study and informed consent was taken. All information were collected in a structured proforma which included demographic characteristics, level of education, indication for cesarean section, risk factors for wound infection (like BMI, Diabetes Mellitus etc) and record of follow up at one week and then after fifteen days. Those patients having infected wounds on follow up were either readmitted depending on the severity of infection or advised outdoor dressing. Swab from pus/tissue fluid was taken aseptically for microbial evidence in leak proof containers and sent to hospital laboratory for culture and sensitivity. Patients were asked for follow up. Outcome was assessed after one week and then fifteen days. Culture and sensitivity report was also availed and recorded.

The collected data was analyzed using SPSS version 20.0. Mean and standard deviation were calculated for quantitative variables like gestational age and age of patient while frequency and percentage distributions were calculated for qualitative variables like parity, educational status, type of wound infection and causative pathogen. All data was presented in the form of tables.

Results

During the study period a total of 392 women underwent cesarean section. Out of these, 47 women developed infected wound, making the wound infection rate of 12% and amongst these 47 paieants,35 (8.9%) patients were readmitted as their wounds were healthy at the time of discharge on 4th post operative day which is the protocole of this unit. 19(4.8%) were primary wound infections. Mean age of women included in our study was 28.7 $\pm$ 6.5 years and gestational age was 38.2 $\pm$ 2.2 weeks. Majority of women 22 (46%) were illiterate followed by 12(26%) of primary education. 20(42.5%) Patients belonged to rural and 17 (36%) were residents of urban areas. 12 (26%) were primiparous, 22(47%) had parity 2-5 and 13(27%) were grand and great grand multipara having parity >6. (Table: I)

Level of wound infection was, superficial incision infection 30(63.8%), deep incision infection 13(27.6%) and organ/space infection was 4(8.5%) in these patients. (Table: II) Emergency and elective cesarean sections were 36(76%) and 11(24%) respectively. In these cesarean sections wound infection cases 12(24.6%) were done for the indication of fetal distress, 9(19%) for malpresentations, 7(14.8%) for previous one cesarean section and 7 (14.7%) for cephalopelvic disproportion.

Evidence of causative pathogen in infected wound samples was seen in 25 patients. Staphylococcus aureus was the commonest pathogen and found in 15 wounds (42%) followed by E. coli 7(14.8%), Staphylococcus epidermidis 3(6.38%), Proteus mirabilis1 (2%), Enterobacter 1(2%) and Pseudomonas aeruginosa 1(2%) of patient wounds. There was mixed growth in 5(10%) and no growth was seen in 14(31%) of samples.

The average length of stay in the hospital for patients with infected wound was 10.7± 2.9 days.

Table I: Demographic Data.

Variables		Frequency	Percentage
Age (years)	18 – 25	12	25.5%
	26 – 35	23	49%
	36 – 45	12	25.5%
Gestational Age (weeks)	32 – 36	16	34%
	37 – 40	19	40%
	>40	12	26%
Education	Illiterate	22	46%
	Primary	12	26%
	Secondary	8	17%
	Matric	5	11%
Region	Urban	17	36%
	Rural	30	63.8%
Parity	0 – 1	12	26%
	2- 5	22	47%
	>5	13	27%

Table II: Frequency of level of wound infection. (n=47)

Levels of wound infection*	Frequency	Percentage
Superficial incision infection	30	63.8%
Deep incision infection	13	27.6%
Organ/Space infection	4	8.5%

**CDC levels of wound infection*

Table II: Frequency of different pathogens in post caesarean wound infections. (n=47)

Pathogen	Frequency	Percentage(%)
Staphylococcus aureus	15	32
Escherichia coli	7	14.8
Staphylococcus epidermidis	3	6
Proteus mirabilis	1	2
Enterobacter	1	2
Pseudomonas aeruginosa	1	2
Mixed growth	5	10
No growth	14	31

Discussion

Postoperative wound infection or surgical site infection (SSI) is still a very common postoperative complication especially in the developing countries like Pakistan. This poses a burden to the health care system and their prevention should be one of the top priorities by health care providers. There is need for surgical site infection surveillance during and after surgeries to obtain a standardized incidence.

World Health Organization (WHO) recommends that national rates of postoperative wound infection should not exceed 10 to 15%.[19, 20] We found a post caesarean wound infection incidence of 12% but various degrees of wound infection rates are found in our different regions. Jabbar S et al. in their study at Civil hospital Karachi reported postcesarean wound infection rate of 24.3%.[21] Safi FN et al. in their study at Hayatabad Medical Complex, Peshawar also reported the same rates. [22] Jido T et al. observed post caesarean section wound infection rate of 9.1%. [23] The difference may be attributed to post discharge surveillance. Vast majority of our infected wounds were of the type superficial incision infections, Jabbar S et al. also observed this type of infections in 51.1% of their cases. [21]

Young age group (26 to 35years) was the most common age group to develop wound infection and the percentage observed in our study was (49%). Safi FN et al. also reported the same percentage of 49% in their patients in the same age group.[22] The median age was not different than that have been observed by Mitt P et al.[24] Regarding parity, 47% of our cases were multipara having parity between 2 to 5. Dhar H et al. in their study at a referral hospital in Oman, with a sample size of 431, reported that wound infections were most prevalent with 45.9% in women having parity between 2 to 5. [25] Similar results were also observed in another study conducted at Karachi .[26]

Wound infections continue to be the most common hospital acquired infections. Confirming the causative organisms leads to good recovery as well as economy of antibiotics. In our study, microbiological evidence was confirmed in 33 cases with the commonest pathogen being Staphylococcus aureus which was isolated in 32% of the cases followed by Escherichia coli 14.8%. Staphylococcus aureus being the most common cause of nosocomial infections and it was seen as the principal pathogen observed by Safi FN et al. (24%) cases. [22] Dhar H et al. observed 31.2% cases due to S.aureus followed by 18.9% due to E.coli [25] Both studies closely resemble our results. Shriyan et al. [27] and Nwachukwu

et al. [28] also reported S.aureus the commonest pathogen in their studies on infected wounds. The usual source of infection from this pathogen is patient's own flora or exogenous source. However contrary to our findings, Ali SA et al. found Pseudomonas, E.coli and Klebsiella being the most common organisms in their study. [29]

In our study, there were several limitations like lack of standardized surgical skills levels as per qualification, variable preoperative preparations and intrapartum events prior to cesarean section.

Conclusion

More standardized research is required to know the exact causative organism to reduce postoperative wound infections. Various recommendations include ensuring sterile environment, aseptic technique, meticulous haemostasis and the use of preoperative antibiotics. Reducing the post operative wound infections will reduce the morbidity and the associated socioeconomic consequences for the patient and her family.

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