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Research Article

Associated incidence and risk factors of surgical site infection among female patients undergoing cesarean section in Pakistan

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ABSTRACT

Introduction: Surgical site infection (SSI) show up in the postoperative period that happens inside 30 or 90 days of post-agent procedure on account of metallic embed addition. Infection has dependably been an element of human life and sepsis in present day surgery keeps on being a critical issue for medicinal services experts over the world.
Objectives of the study: The main objective of the study is to find the SSI rate and to identify risk factors after cesarean section.
Material and methods: The current study was conducted at Mayo Hospital Lahore during March 2017 to December 2017. The data include all those women who delivered baby through C-section. The data was collected on the basis of demographic factor and social factors of the patients.
Results: A total of 200 patients are involved in this study. We can find that there is a significant relationship between SSI and types of anesthesia used for surgery. The position of the baby does not have any significant role in SSI.
Conclusion: It is concluded that significant independent risk factors for SSI were as follows: higher BMI, increase in the amount of blood loss during surgery, breech baby presentation, intrathecal analgesia, spinal anesthesia, and the duration of hospital stay. The risk factors identified in this study are important in terms of the potential review of practice and subsequent reduction in SSI.

Keywords: SSI, C-section, Risk factors, association

INTRODUCTION

Infection is defined as an invasion and multiplication of microorganisms in body cells and tissues, which may be clinically unapparent or result in local cellular injury because of competitive metabolism, toxins, intracellular replication or antigen-antibody response.[1]Surgical site infection (SSI) show up in the postoperative period that happens inside 30 or 90 days of post-agent procedure on account of metallic embed addition. Infection has dependably been an element of human life and sepsis in present day surgery keeps on being a critical issue for medicinal services experts over the globe. It isn't just a vital reason for horribleness and mortality yet additionally cause extreme financial weight all through the world by causing torment, expanding the danger of hospital readmission and making rehashed procedures more probable.[2] Surgical site infection (SSI) is the second most regular irresistible entanglement after urinary tract infection following cesarean section (CS) delivery. Surgical site infection after cesarean

section is related with expanded maternal bleakness, delayed hospital stay, and expanded therapeutic expenses.[3] The gainful impact of anti-toxin prophylaxis in decreasing events of infection related with elective or crisis cesarean section is as of now settled. In numerous organizations, the anti-infection organization is performed after the umbilical rope has been braced, defended by the neonatal effect of antimicrobial utilize.[4] Albeit antimicrobial prophylaxis decreases the danger of endometritis and incisional SSI when controlled accurately, much has been examined about its genuine effect because of the modest number of studies and their constraints.[5]

The frequency of SSI contrasts starting with one nation then onto the next as per the distinctive frameworks utilized for the epidemiological control of hospital infections. While the worldwide assessments of SSI have fluctuated from 0.5-15%, in the United States, each year SSI creates in 2-5% of patients, bringing about no less than 500,000 infections, 3.7 million abundance hospital days and $1.6 billion in additional hospital charges.8,9 Studies in India have reliably indicated higher rates of SSI running from 16-38.8%. Surgical site infection is connected to factors related with surgery, which may impact the danger of infection. Another hazard factor which may add to SSI is weight record (BMI). A more noteworthy rate of infection related with fat ladies experiencing CS surgery has been accounted for.[6,7]

Theoretical background of the study

There are different factors which influence on SSI and determine various risks factors influencing the SSI rate. A better understanding of the risk factors related with SSI could help lessen their event by advancing powerful techniques for infection anticipation. So there is an extraordinary need of the investigations for better understanding of the rate and hazard factors of SSI in the creating nations like Pakistan.

Objectives of the study

The main objective of the study is to find the SSI rate and to identify risk factors after cesarean section.

MATERIAL AND METHODS

DATA COLLECTION

The current study was conducted at Mayo Hospital Lahore during March 2017 to December 2017. The data include all those women who delivered baby through C-section. The data was collected on the basis of demographic factor and social factors of the patients. We collected all the information related to medical record, body mass index, age, number of child's, anesthesia techniques during surgery, blood loss due to surgery and incidence of infection. The data was collected with the permission of ethical department of Mayo hospital, Lahore. The sample size was 200 patients during March 2017 to December 2017.

STATISTICAL ANALYSIS

The collected data were analyzed using SPSS software (version 17). The results are presented as a mean with 95% confidence interval limits or standard deviations. The significant value for P <.05 was accepted as statistically significant.

ANALYSIS AND RESULTS

We collect the data of 200 females from the hospital and these all females undergo C-section for delivery. Some of them get spinal anesthesia and some get general anesthesia. They belong to different sociological background. The mean age of selected sample size was 20 to 45 years and mean weight was 40 to 120kg. According to analysis of result almost 7% received general anesthesia and 3.25% received epidural and spinal anesthesia (table 1 and 2).

Table 01: Basic characteristics of patients

Gestational Age	6 38±1.3
Poor class	49%
Middle class	40%
Upper class	10.7%
educated	11.7%
Illiterate	55%

Table 02: Demographic characteristics and history of patients

Demographic characteristics		% age
Age	≤25	60.4
	>31	39.6
Body mass index	≤30	66.0
	>30	44.0
History of C-section	Yes	37.3
	No	62.8
Operation time in minutes	≤60	54.0
	>60	46.0
Reason of C-section	Fetal distress	27.8
	Previous CS	26.1
	Breech presentation	16.8
	Poor progress	6.5
	Twin babies	2.5
	Severe preeclampsia	2.5
Types of anesthesia	General	7.0
	Epidural	3.55
	Spinal	82.1
Type of C-section	Emergency	63.25
	Elective	36.75

Table 03 shows the data regarding use of antibiotics after C-section. These antibiotics are used for women undergo C-section.

Table 03: Types of antibiotics which were used by patients

Type of antibiotic	Dose (mg)	%age
Cefuroxime (oral)	250	4.3
Metronidazole (oral)	500	3.3
Unasyn oral (ampicillin sodium/sulbactam sodium)	375	41
Ampicillin IV	1000	7.5
Cloxacillin (oral)	1000	2.5
Metronidazole	500	3.5
Cefuroxime IV	750	1.3

Table 04 represents the risk factors which are associated with surgical site infections. These results shows that there is a statistical significant relationship in reasons of C-section and types of anesthesia used for surgery. However there is no link of SSI with age, time of surgery and types of C-section. It means infection does not depend upon age and time of surgery but it depends upon type of anesthesia used and blood loss during surgery.

Table 04: Associated risk factors of surgical site infection (SSI) in females of Mayo hospital Lahore.

Demographic characteristics		SSI (%)		P value
		With infection	Without infection	
Age	≤25	56.1	61.5	0.345
	>31	44.0	38.5	
Body mass index	≤30	52.2	42.3	0.13*
	>30	47.8	57.7	
Operation time in minutes	≤60	44.0	42.8	0.876
	>60	56.0	57.2	
Reason of C-section	Fetal distress	25.34	28.3	0.012*
	Previous CS	22.7	26.5	
	Breech presentation	5.6	14.2	
	Poor progress	2.7	13.6	
	Twin babies	2.7	2.5	
	Severe preeclampsia	1.3	2.70.	
Types of anesthesia	General	13.3	5.5	0.001*
	Epidural	9.3	1.8	
	spinal	77.3	92.6	
Type of C-section	Emergency	32.0	37.8	0.344
	Elective	68.0	63.2	

The outcomes demonstrate that a higher BMI and additionally an expansion in the blood misfortune amid surgery were related with improve the probability of having SSI. Ladies with a breech introduction infant had greater probability of having SSI contrasted and ladies having different sorts of CS sign. Turning to anesthetic techniques, patients with spinal anesthesia and intrathecal analgesia had more likelihood of having SSI. These variables were found to be independent predictors for SSI in the women who underwent cesarean.

DISCUSSION AND CONCLUSION

Caesarean section being performed with increased frequency, there's the perception to regard it as an uncomplicated and straight forward procedure but complications do occur causing significant morbidity and mortality. SSI is the second most normal irresistible intricacy after UTI following cesarean delivery.[8]For the dominant part of obstetric patients, it once in a while speaks to a danger to life. Be that as it may, there are broad dismalness and financial results for the social insurance administrations. Accomplishment of task relies on an appropriate preoperative care. Hazard lessening is the objective of very much composed arrangement for preoperative administration and care of patient experiencing obstetric surgery. To be best, the arranging starts with a suitable preoperative assessment and proceeds with ideal intra-agent basic leadership and system and care amid post-agent periods. These care designs are especially critical for patients with rehash cesarean section.[9]

To the best of our insight this is the primary examination in India detailing occurrence and hazard factors related with Obstetric and Gynecological surgeries at the same time. An examination from Tanzania announced a SSI rate of 10.9% among 774 patients experiencing CD. An investigation from Estonia detailed a SSI rate of 6.2% among 305 patients that experienced cesarean section conveyances and had a 30-day follow-up post-surgery.[10] An associate of ladies with CD from Thai-Myanmar outskirt demonstrated a SSI rate of 5.9%. All the above investigations have revealed a higher rate of SSI among the CDs when contrasted with our examination. An Italian investigation detailed a SSI rate of 4.7% from 430 moms with CD incorporated into the examination. An examination from Israel revealed a SSI rate of 3.7%, which is like our investigation. One purpose behind low rate of SSI in our investigation could be because of high extent of patients having a place with spotless or clean polluted injuries.[11]It is notable that patients with sullied wounds have about three-crease expanded danger of SSI contrasted with non-tainted injuries. Other reason could be because of the way that the vast majority of the CDs were done inside 60 minutes. This may be because of experience of the working group. In any case, it has been demonstrated that CDs performed by occupant showing administrations expanded the hazard for SSI. This may be because of absence of surgical experience among the working inhabitants.[12-14]

A large portion of the SSIs found in our investigation were superficial SSI. This is like different examinations from asset compelled settings. In USA additionally around 66% of the SSI are shallow and staying profound. In USA the assessed frequency of SSIs in hysterectomy is around 1.7%. Be that as it may, as indicated by the creators this is by all accounts a think little of the same number of hospitals do not have the assets to track SSI happening outside of the hospital.[15-18]

Young maternal age has been appeared to be a hazard factor for SSI following cesarean section. Nonetheless, our investigation we found that age over 40 years as a hazard factor for SSI. This might be because of the patient blend in our examination, which included both gynecological and obstetric surgeries. A territorial community information from USA did not demonstrate any distinction in age of the ladies having SSI following hysterectomy.[19]

Unseemly planning of anti-infection prophylaxis in our examination was a critical hazard factor for SSI. Comparable outcomes have been accounted for before and are additionally in accordance with

suggestions from prophylaxis rules. Nonetheless, amid the examination period no standard strategy for prophylaxis was taken after. The American Congress of Obstetricians and Gynecologists prescribes pre-agent anti-microbial prophylaxis for hysterectomies, prompted premature births, hysterosalpingography, and uro-gynacological procedures.[20]

CONCLUSION

It is concluded that significant independent risk factors for SSI were as follows: higher BMI, increase in the amount of blood loss during surgery, breech baby presentation, intrathecal analgesia, spinal anesthesia, and the duration of hospital stay. The risk factors identified in this study are important in terms of the potential review of practice and subsequent reduction in SSI.

Contribution of authors

All the authors contributed equally. Dr. Hafiz Irshad Ahmed conceived of the presented idea and do all the lab work and carried out the experiment with other co-authors. Dr. Hafiz Muhammad Nadeem developed the theory and performed the computations. Dr. Maria supervised the findings of this work and Dr. Hafiz Irshad and Dr. Maria developed the theoretical formalism, performed the analytic calculations and performed the numerical simulations. All the authors contributed to the final version of the manuscript.

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