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Risk factors of surgical site infections after caesarean section: A study in a tertiary care hospital

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Abstract

Background: In recent years increasing rates of cesarean deliveries have received widespread attention and have increased widespread discussion in the public domain in Bangladesh. Besides these, surgical site infection is one of the most common complications following caesarean section. But we have very limited data on this issue.

Aim of the study: The aim of this study was to assess the risk factors of surgical site injections after caesarean section deliveries.

Methods and Materials: This was an observational study which was conducted in the Department of Surgery collaboratively with the Department of Gynaecology of 250 Bedded Bongamata Sheikh Fazilatunnesa Mujib General Hospital, Sirajganj, Bangladesh during the period from January 2018 to June 2018. In total 86 patients with surgical site injections after caesarean section were selected as the study population of this study. This study had been approved by the ethical committee of the mention hospital previously. The proper written consents were obtained from each of the participants before starting the main intervention. The cases studied were the patients whose caesarean section was complicated by surgical site infections only. Cases with other major complications were excluded from the study according to the exclusion criteria.

Results: According to the frequencies of medical risk factors the highest 47.67% (n=41) patients were with anaemia whereas 27.91% (n=24) were with diabetes, 19.77% (n=17) were with hypertensive disorders and 4.65% (n=4) were with hypothyroidism. On the other hand according to the frequencies of obstetric risk factors we found the highest 26.74% (n=23) patients were with PROM > 8 hours, 19.77% (n=17) were with failed induction and only 15.12% (n=13) were with previous LSCS.

Conclusion: Through our study we found that, it is very important for antenatal women to have regular antenatal visits doctors or hospitals so that modifiable risk factors like anaemia are corrected before term. Proper assessment of risk factors that predispose to surgical site infection is critical for the development of strategies for reducing the incidence of surgical site infection and for identifying high risk patients requiring intensive postoperative surveillance.

Keywords: caesarean section, culture and sensitivity, surgical site infection

1. Introduction

In recent years increasing rates of cesarean deliveries have received widespread attention and have increased widespread discussion in the public domain in Bangladesh. Besides these, surgical site infection is one of the most common complications following caesarean section. But we have very limited data on this issue. Surgical site infections are among the most common hospital acquired infections. They make up to 14-16% of inpatient infections [1]. It has physical and emotional burden on the mother and significant financial burden on the health care system [2]. The increasing incidence of caesarean deliveries worldwide has contributed to greater wound morbidity [3]. Knowledge of the organisms causing surgical site infection and their antibiotic sensitivity and resistance patterns provide an insight into the current antibiotic prescription practices and the factors affecting these practices [4]. The aim of this study was to assess the risk factors surgical site injections after caesarean section deliveries. All the procedures of this study was carried out to acquire the major objectives of this study.

2. Objectives

General objective

- To assess the risk factors of surgical site injections after caesarean section.

Specific objective

- To assess the gravidity status and circumstances of selection of caesarean section procedure.

3. Methodology and Materials

This was an observational study which was conducted in the Department of Surgery collaboratively with the Department of Gynaecology of 250 Bed Bongamata Sheikh Fazilatunnesa Mujib General Hospital, Sirajganj, Bangladesh during the period from January 2018 to June 2018. In total 86 patients with surgical site injections after caesarean section were selected as the study population of this study. This study had been approved by the ethical committee of the mention hospital previously. The proper written consents were obtained from each of the participants before starting the main intervention. The cases studied

Were the patients whose caesarean section was complicated by surgical site infections only. Cases with other major complications were excluded from the study according to the exclusion criteria. Diagnostic criteria were maternal fever accompanied by spontaneous parting of wound or purulent discharge from the wound with or without positive bacterial culture. Pus samples were collected from the wound site and sent for culture and sensitivity. Demographic information, potential risk factors as well as operative findings were recorded. For collecting patient's data a pre designed questioner was used. For arranging data MS Excel and analyzing SPSS version-16 were used. To disseminate the findings of this study several tables and figures were used.

4. Results

In this study among total 86 participants the highest 53% were from 20-25 years' age group. Then 33% were from 26-30 years' age group, 8% were from >30 Years' age group and the rest 6% were from <20 years age group. In analyzing the gravidity of the participants we found the highest 59.30% (n=51) cases were with primi gravida whereas 29.07% (n=25) were with gravida-2, 9.30% (n=8) were with gravida-3 and the rest 2.33% (n=2) were with more than 3 gravida. In this study, we found the highest 85% (n=73) participants taken the cesarean section because of emergency circumstances whereas only 15% (n=13) participants taken electively. In this prospective study in analyzing the risk factors we found four major medical risk factors as well as three major obstetric risk factors. According to the frequencies of medical risk factors the highest 47.67% (n=41) patients were with anaemia whereas 27.91% (n=24) were with diabetes, 19.77% (n=17) were with hypertensive disorders and 4.65% (n=4) were with hypothyroidism. On the other hand according to the frequencies of obstetric risk factors we found the highest 26.74% (n=23) patients were with PROM > 8 hours, 19.77% (n=17) were with failed induction and only 15.12% (n=13) were with previous LSCS. In analyzing the causative organisms for the surgery site infection we found the highest 52.33% patients were associated with E coli whereas 9.3% with Steph. Heamolyticus infections, 5.16% with E. aerogens infections and 33.21% with different mixed infections with some other causative organism infections.

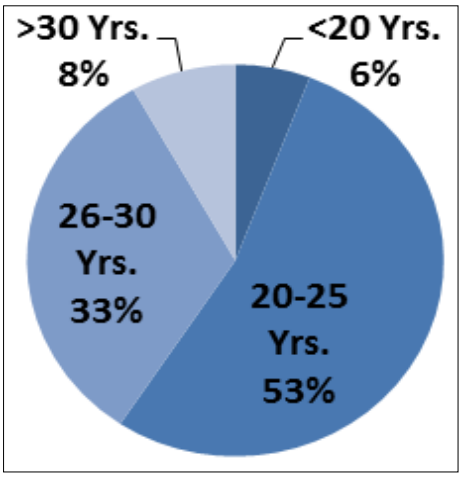

Fig 1: Age distribution of the participants (N=86)

Table 1: Gravidity distribution among participants (N=86)

Gravidity number	n	%
Primi gravida	51	59.30
Gravida-2	25	29.07
Gravida-3	8	9.30
Gravida>3	2	2.33
Total	86	100

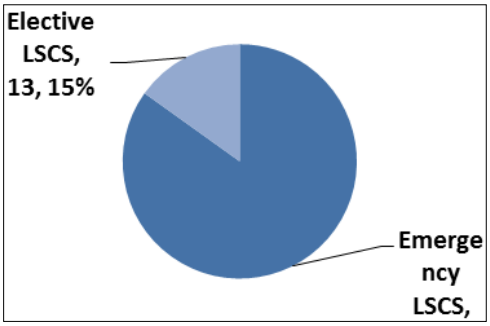

Fig 2: Circumstances of CS of participants (N=86)

Table 2: Risk factors distribution among participants (N=86)

Risk factors	n	%
Medical risk factors		
Anaemia	41	47.67
Diabetes	24	27.91
Hypertensive disorders	17	19.77
Hypothyroidism	4	4.65
Obstetric risk factors		
PROM > 8 hours	23	26.74
Failed Induction	17	19.77
Prev. LSCS	13	15.12

5. Discussion

Surgical site infection is the second most common infectious complication after urinary tract infection following caesarean delivery [5]. It is a surgical complication with a high morbidity rate, but it is associated with predictable and preventable risk factors [6]. Majority of the patients in our study group are from rural areas 71% and 29% from urban areas hence antenatal care services should be strengthened in rural area [7]. Majority of the cases were un booked which indicates the requirement of antenatal care that provides opportunities for health education, prior detection and correction of maternal problems [8]. In present study 48% of the patients had Anaemia [9]. Patients with Anaemia were seen to be more prone to surgical site infection [10]. Anaemia diminishes resistance to infection and is frequently associated with puerperal sepsis [11]. Poor control of glucose during surgery and in the perioperative period increases the risk of infection [12]. 15% of the cases in our study had a repeat Caesarean section [13]. PROM is seen in 27% of cases. PROM associated with the largest bacterial inoculum and liquor gets infected and infection supervenes [14]. An obstetric related risk factor of both intrinsic and extrinsic origin is length of time that the membranes are ruptured prior to caesarean section [15]. Following membrane rupture, the amniotic fluid is no longer sterile and may act as a transport medium by which bacteria come into contact with the uterine and skin incisions [16]. The increased incidence of surgical site infection in cases with intact membranes may be due to multiple vaginal examinations in

Cases with failed induction [17]. The most common pathogenic organisms causing surgical site infection in present study were found to be Escherichia coli strains which were found to be resistant to cefuroxime [18]. Majority of the surgical site infection, 63% required secondary suturing while in 37% of the cases, the wound healed with daily aseptic dressings and secondary intention [19]. Through this study we found that, proper assessment of risk factors that predispose to surgical site infection is critical for the development of strategies for reducing the incidence of surgical site infection and for identifying high risk patients requiring intensive postoperative surveillance.

Limitations of the study

This was a single centered study with small sample size. So, the findings of this may not reflect the exact scenario of the whole community.

Conclusion and Recommendations

Through our study we found that, it is very important for antenatal women to have regular antenatal visits doctors or hospitals so that modifiable risk factors like anaemia are corrected before term. Proper assessment of risk factors that predispose to surgical site infection is critical for the development of strategies for reducing the incidence of surgical site infection and for identifying high risk patients requiring intensive postoperative surveillance. For getting more specific findings we would like to recommend for conducting more studies with larger sized sample.

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