

The impact of intraoperative gloves changing by the surgical team on the post operative wound infection after a Caesarean section, in a tertiary care hospital

Abstract

Background: Cesarean delivery is a major obstetrical surgical procedure aiming to save the lives of mothers and fetuses. Cesarean deliveries were initially performed to separate the mother and the fetus in an attempt to save the fetus of a moribund patient. Access to nonmedical interventions during labor, such as continuous support during labor and delivery, should be increased. The safe practice during cesarean can provide the protection from infection.

Objective: To compare the outcome with changing gloves intra-operatively by entire team versus standard practice (no changing gloves) during cesarean section

Material & methods: study design: Randomized controlled trial.

Setting: Department of Obstetrics & Gynaecology, Shalamar Hospital Lahore for 6months.

Data collection: After meeting the inclusion criteria 160females were enrolled. Then females were randomly divided into two groups. Group A females operated with changing gloves of entire team and group B operated with no changing gloves. During ward follow-up, females were evaluated for febrile morbidity. At the time of stitches removal wound infection was observed. All the collected data was entered and analyzed on SPSS version 21.

Results: The mean age of females was 29.06 ± 6.79 years, the mean gestational age at delivery was 38.88 ± 1.47 weeks. In changing gloves group the wound infection was found in 4(5.0%) females while in no changing gloves group the wound infection was found in 15(18.8%) females (p -value=0.013).

Conclusion: The adopting changing gloves practice by entire team during cesarean section showed better outcome in terms of wound infection and febrile morbidity than no changing glove practice.

Keywords: changing gloves, cesarean section, wound infection, febrile morbidity

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Introduction

Cesarean section is one of the most occurring surgical procedure, which is performed to deliver a baby to save the life of neonate and them other.¹ It is defined as delivery of neonate / fetus via making a surgical incision in lower abdominal wall and uterus.² The incidence of cesareans, both; primary and repeat, has been increased significant during last 2-3 decades. It is estimated that around 22.9million cesarean sections were performed during the year 2012.^{3,4} As it is a surgical procedure, it have several complications, including surgical site infection, the commonest one.⁵ Post-cesarean wound infection represents the considerable burden for health care system and deterrence of such infection must be a priority in health care system of a developing country.⁶ The worldwide prevalence of postoperative wound infection ranged from 0.5–15%. Wound infection may develop due to intra-operative bacterial load inside tissue at wound site and reduced reliability of immune system of the patient.⁷

Wearing surgical gloves is a show piece of asepsis, which guarantees the prevention of cutaneous microbes from surgeons and also protect the complete team from biological fluids of patient.⁸ Experiments were done to reduce the chances of bacterial contamination related to

the changing gloves. Glove change during surgical procedure is also suggested to reduce the peri-operative contamination.⁹

Rationale of this study is to compare the outcome with changing gloves intraoperatively by entire team versus standard practice (no changing gloves) during cesarean section. Literature has showed that the frequency of wound infection and febrile morbidity decreases by practice of changing gloves during cesarean section. Wound infection and febrile morbidity increases the cost of post-cesarean hospital stay by increasing cost of antibiotics treatment and duration of hospital stay. Instead of that if gloves would be changed during cesarean section, it will cut down the cost of post-operative complications. But in routine, gloves are not changed. This may be due to lack of local evidence and in literature not much work has been done in this regard. Moreover, no local evidence has been found in literature which could help us in implementing the practice of changing gloves by entire team during cesarean section.

Objective

To compare the outcome with changing gloves intra-operatively by entire team versus standard practice (no changing gloves) during cesarean section.

Material and methods

Study design: Randomized Controlled Trial;

Setting: Department of Obstetrics and Gynaecology, Shalamar Hospital Lahore;

Duration: Six months i.e. 23-6-2018 to 24-12-2018;

Sample size: Sample size of 160 females; 80 females in each group was calculated with 80% power of test, 5% level of significance and taking expected percentage of wound infection i.e. 4% with changing gloves and 18% with standard practice by entire team during cesarean section.⁹

Sampling technique: Non-probability, consecutive sampling.

Inclusion criteria: Females of age 18-40 years, parity <5, presenting at gestational age >37 weeks (on LMP) undergoing elective cesarean section under spinal anesthesia were included;

Exclusion criteria: Female with ASA III & IV, emergency cases or cases required general anesthesia, hypertension (BP ≥140/90 mmHg), diabetes (BSR >186 mg/dl), anemia (Hb <10 g/dl) or PROM (>6 hours before cesarean) were excluded from the study.

Data collection procedure: 160 females who fulfilled the inclusion criteria were enrolled in the study from labour room. Informed consent was obtained. Demographic details (name, age, parity, BMI, gestational age) were noted. Then females were randomly divided in two groups by using random number table. In group A, gloves were changed by the entire team before abdominal closure. In group B, standard practice was adopted i.e. gloves were not changed by surgeon or any team member before abdominal closure. All cesarean

sections were done by researcher herself. The patients were shifted to post-operative wards for 48 hours. During ward follow-up, they were evaluated for febrile morbidity (presence of a maternal temperature ≥100.4° F (38°C) occurring 24 hours after caesarean section in combination with a greater than expected uterine tenderness. The patients were then discharged and followed-up in outpatient department for suture removal. At the time of stitches removal, wound was evaluated for presence or absence of signs of wound infection like presence of hyperemia, induration, tenderness, purulent discharge or fluctuant, tender, erythematous incision margins within 7 days of cesarean section). All this information was collected in a pre-designed preformed.

Data analysis: Data was entered and analyzed by SPSS version 21. Both groups were compared for outcome (wound infection and febrile morbidity) by using chi-square test. p-value ≤0.05 was taken as significant.

Results

In this study among group A the mean age of the females was 28.89 ± 6.97 years while in group B the mean age of the females was 29.23 ± 6.65 years. The mean gestational age at delivery was 38.60 ± 1.47 weeks while in group B was 39.16 ± 1.43 weeks. In group A the mean BMI of females was 26.36 ± 2.96 kg/m² while in group B was 26.00 ± 3.01 kg/m² (Table 1).

Febrile morbidity observed in 1 (1.2%) patients in group A while 6 (7.5%) in group B. This difference was statistically insignificant with a p-value of 0.117. Wound infection was observed in 5.0% patients in group A and in 18.8% patients in group B. This difference was statistically insignificant i.e. p-value = 0.013 (Table 2).

Table 1 Demographics of patients

| | Groups | |
|--------------------------------|----------------------|-------------------------|
| | With changing gloves | Without changing gloves |
| n | 80 | 80 |
| Age (Years) | 28.89 ± 6.97 | 29.23 ± 6.65 |
| Gestational Age (weeks) | 38.60 ± 1.47 | 39.16 ± 1.43 |
| Primigravida | 11 (13.8%) | 18 (22.5%) |
| Multigravida | 69 (86.2%) | 62 (77.5%) |
| BMI (Kg/m²) | 26.36 ± 2.96 | 26.00 ± 3.01 |

Table 2 Comparison of outcome in both groups

| | | Groups | | | p-value |
|--------------------------|------------|----------------------|-------------------------|-------|---------|
| | | With changing gloves | Without changing gloves | Total | |
| Febrile morbidity | Yes | 1 | 6 | 7 | 0.117 |
| | | 1.2% | 7.5% | 4.4% | |
| | No | 79 | 74 | 153 | |
| | | 98.8% | 92.5% | 95.6% | |
| Wound infection | Yes | 4 | 15 | 19 | 0.013 |
| | | 5.0% | 18.8% | 11.9% | |
| | No | 76 | 65 | 141 | |
| | | 95.0% | 81.2% | 88.1% | |

Discussion

Cesarean section is the major obstetrical surgery done to save the lives of neonate and mother. Postoperative wound infection is still the commonest complication of cesarean section. Strategies aimed at prevention of this complication can reduce the morbidity and the costs involved in treating the infection afterwards.^{1,10} In the patients from group A showed the febrile morbidity was seen in 1.2% respondents while the wound infection found in 5.0%. In group B the febrile morbidity was found in 7.5% (p-value; 0.117) and the wound infection was found in 18.8% females (p-value; 0.013). Our results were comparable to a few other reported studies in terms of reduced postoperative wound infection.⁷⁻¹² In addition, the febrile morbidity was 0% with changing gloves while 6% with the standard practice (p<0.05).^{13,14}

Other studies differed in methodology, like the entire team changing their surgical gloves immediately after delivery of placenta and before closure of skin. The sero-sanguineous drainage 24 hours after surgery was significantly less in the intervention group.¹⁵ Our results differ from Carnadas et al.,¹⁶ who did not find the outcome to be statistically significant.¹⁶

Yet another study concluded that under standard surgical circumstances, surgeries done without changing gloves are time & cost-effective as compared to the surgeries performed with changing gloves during surgery with similar surgical & functional outcomes. According to them a cautious use of surgical gloves is the patient and environment friendly decision, thus reducing the hospital's biomedical waste load.¹⁷

Conclusion

This study concluded that the adopting changing gloves practice by entire team during cesarean section showed better outcome in terms of wound infection and febrile mortality as compared to no changing glove practice. The technique should at least be adopted in the patients and the set ups where the chances of wound infection are higher.

Acknowledgments

None.

Conflicts of interest

No conflicts of interest.

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