

# Impact of Changing Sterile Glove at the Time of Wound Closure to Reduce Surgical Site Infection in Women Undergoing Elective Cesarean Section; a Prospective Randomized Controlled Clinical Trial

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## Abstract

**Background:** Surgical site infections (SSIs) among surgical patients are the most common nosocomial infection, accounting for 38 percent of nosocomial infections. It is estimated that SSIs develop in 2 to 5 percent of the more than 30 million patients undergoing surgical procedures each year. **Aim of the work:** Assessment of the impact of changing sterile gloves at the time of wound closure to reduce SSI in women undergoing elective cesarean section (CS). **Patients and Methods:** The study was done from February 2023 to July 2023 at Ain Shams University Hospital. 220 Women were randomly distributed and blindly allocated into two groups. Group A (operative glove changing group "n=110"), Group B (usual care group "n=110"). Postoperative febrile morbidity, cellulitis, need for antibiotics for skin- or wound-related infection, and endometritis were compared between study groups. **Results:** Postoperative wound complications were statistically significantly higher among cases not subject to a change of sterile gloves, 28.0% vs. 9.8%. On the other hand, no differences were noted between

study groups as regards operative duration  $61.39 \pm 7.76$  vs.  $59.35 \pm 8.11$  minutes.

**Conclusion:** Changing sterile gloves at the time of wound closure reduces surgical site infection and associated morbidity in women undergoing elective CS.

**Keywords:** Changing Glove; Surgical Site Infection; Cesarean Section

## Introduction:

CS is the most common major operation preformed worldwide. In daily obstetric practice. It account for up to 60% of all births in some countries.[1]

Previous study reported that Egypt has the third highest CS rate (54%) in the world and lacks a standard classification system to analyze CS rates[2], following Do-minican Republic (56.4 percent) and Brazil (55.6 percent). Within the Arab region, rates of CS are far higher in Egypt than any other Arab country. [3]

In another study, the CS rate in Egypt was estimated at 55.1%, and the highest rate was 67.8% in Behira and the lowest was 49.0% in Assiut. In most governorates, the CS rate was higher in rural than in urban areas, but the difference was not significant. High CS rates were significantly related to higher social class and lower number of children ( $\leq 3$ ). [4]

The percentage of "unjustified" caesarean deliveries has exceeded 62 percent of total deliveries in Egypt, many of which could have been done naturally. In August 2022, the Central Agency for Public Mobilization and Statistics (CAPMAS) reported a noticeable increase in C-sections in recent years. CAPMAS found that C-sections increased to 72 percent of all deliveries in 2021, up from 52 percent in 2014. The agency also found that C-sections in rural areas increased to 84 percent of all deliveries in 2021, up from 70.6 percent in 2014. [5]

One of the most serious complications after CS is wound complication it varies from 3 to 30%.[6]

It may be infectious as SSI or non-infectious as hematoma, seroma, and wound separation. These complications cause increase hospital stay or readmission also, maternal morbidity and cost are increased. [7]

SSIs are a common cause of health care-associated infection. The United States Centers for Disease Control and Prevention (CDC) has developed criteria that define SSI as infection related to an operative procedure that occurs at or near the surgical incision within 30 days of the procedure or within 90 days if prosthetic material is implanted at surgery. SSIs are often localized to the incision site (superficial/deep incisional SSI) but can also extend into deep tissues.[8]

There were numerous recommend-dations for SSI prevention efforts in recent World Health Organization (WHO) guidelines, however most of these interventions were not well-supported by high-quality evidence. [9]

The WHO recommendations for change of gloves at the time of fascial closure were identified as the priority recommendations. Three studies have been published to date, all suggesting to a benefit, however the particular evidence for SSI reduction with glove change prior to fascial closure is limited, consisting primarily of small RCTs with a high risk of bias.[10]

The CDC, WHO, and NICE guidelines do not recommend changing gloves as part of routine care due to the poor evidence data base. The executive summary of the 2017 WHO Guidelines on SSI Reduction Practice indicates that well-designed RCTs would be requested because there is no direct proof of the usefulness of sterile surgical gloves changing before wound closure.[11]

The CDC Healthcare-associated infection (HAI) prevalence survey found 110,800 SSIs associated with inpatient surgeries in 2015. SSI is the most costly HAI type with an estimated annual cost of \$3.3 billion, and extends hospital length of stay by 9.7 days, with hospitalization costs increasing by more than \$20,000 per admission. [12]

## **Patients and Methods:**

This prospective randomized controlled clinical trial was conducted at the delivery operative theatre, Obstetrics and Gynecology Department, Faculty of Medicine, Ain Shams University Maternity Hospitals from February 2023 to July 2023. The study gained ethical committee approval from the Faculty of Medicine Ain Shams University (FMASU MS 61/2023). The study was registered in the PAN-African clinical trial registry. Patients' informed consent was obtained before enrolling in the study, after which the clinical research's nature, scope, and possible consequences were explained.

The inclusion criteria included pregnant women aged 20-35 years; non-obese with body mass index (BMI) < 30 kg/m<sup>2</sup> with term pregnancy ≥ 37 weeks +0 days; singleton and viable fetuses were enrolled.

The exclusion criteria were obese women with body mass index (BMI) ≥ 30 kg/m<sup>2</sup>, anemic women with hemoglobin level < 10.5 g/dl, immuno-compromised women with medical disorders with pregnancy as diabetes mellitus, hypertension, cardiac, hepatic, or renal disorders, with anticipated pelvic adhesions as cases with a history of endometriosis, pelvic inflammatory diseases or more than previous 3 CSs, multifetal pregnancy, emergency CS, with antepartum hemorrhage (placenta previa or placenta accrete spectrum disorder), obstetric cases with increased risk of infection as premature rupture of membranes (PROMs), and woman who refused to participate in the study or write consent.

Randomization and allocation: Systematic random sampling was used, and women who fulfilled the inclusion criteria were randomly assigned to either group. Two hundred twenty opaque envelopes were numbered serially, and in each envelope, the corresponding letter, which denoted the allocated group, was placed according to the randomization table. Then, all envelopes were closed and put in one box. Randomization was done using a computer-generated randomization sheet using MedCalc © version 13.

The primary outcome was the incidence of SSSI, which included wound seroma, wound infection, and skin separation.

The secondary outcomes were febrile morbidity, cellulitis, the prescription of antibiotics, period of hospital stay, and cost.

Sample Size Justification:

Using the EPI Info 7 software for sample size calculation, with a power of 80% and an alpha error of 0.05, and based on the study by Hameed et al. in 2020, the anticipated incidence of wound infection in the intervention group is 5% and in the control group is 18.8% [13]. A sample size of 100 women per group was necessary to detect the difference between the two groups. To account for an expected 10% loss of follow-up, the sample size was increased to 110 women per group. Group A, the intra-operative glove changing group, involves the surgeon replacing their outer surgical gloves with a new pair of sterile gloves just before abdominal closure. Meanwhile, Group B, the usual care group, entails the surgeon not changing their gloves before abdominal closure.

### Study procedure:

The data were collected in a case report form and all patients received appropriate pre-operative antibiotics in the form of cephazolin “1<sup>st</sup>-generation cephalosporin” (Zinol<sup>®</sup>, 1 g, vial, PHARCO INTERNATIONAL, Egypt) 30 minutes before skin incision and 12 hours postoperative, betadine (povidone-iodine 10%) skin prep, except where allergies prohibited.

Vaginal preparation and cesarean delivery techniques were at the discretion of the attending surgeon.

Abdominal closure was considered to begin with the closure of the peritoneum if performed, otherwise with the closure of the abdominal fascia.

The change of gloves was prior to skin closure, which was done using Vicryl (polyglactin 910), “an absorbable, synthetic, braided suture, manufactured by Ethicon Inc., a subsidiary of Johnson and Johnson, 2/0 or 3/0 with a noncutting curved needle.

All women were discharged on the same home treatment (Augmentin<sup>®</sup>, Amoxicillin/Clavulanic acid, 1 g, tablet, GlaxoSmithKline GSK, Egypt), metronidazole and proper analgesics.

The patient was given wound dressing instructions (keep it dry and clean).

All women were advised to come for follow-up visit one week post-operative, then they were called on their phone after three weeks for a second follow up and assessment of the incidence of SSI

### Statistical Methods:

Recorded data were analyzed using the statistical package for social sciences, version 23.0 (SPSS Inc., Chicago, Illinois, USA).

### Results:

Table 1 shows the demographic and baseline criteria: age, parity, no of CS, BMI, and operative time. There is no statistically significant difference between groups regarding the demographic and clinical criteria between the studied groups.

**Table 1: Comparison between Group A and Group B according to Baseline characteristics**

Baseline characteristics	Group A (n=102)	Group B (n=100)	Test value	P-value
Age (years)				
Mean±SD	29.50±5.64	29.11±5.95	0.25	0.618

Range	19-44	19-41		
<b>Parity</b>				
Median (IQR)	2 (1-3)	2 (1-3)	1.689	0.195
Range	0-6	0-6		
<b>Number of CS</b>				
Median (IQR)	2 (1-3)	2 (1-3)	0.610	0.436
Range	1-4	1-6		
<b>BMI</b>				
Mean±SD	22.17±2.27	21.58±2.35	3.589	0.059
Range	18-25	18-25		
<b>Operation duration (hrs)</b>				
Mean±SD	61.39±7.76	59.35±8.11	3.650	0.057
Range	35-90	35-78		

Table 2 shows that there was a statistically significant higher frequency of wound hematoma in usual care group than intra-operative glove changing group, with p-value (p=0.002); while there is no complications of wound seroma, wound infection, skin separation of at least 1cm and other incisional abnormalities after 1 week, with p-value (p>0.05).

**Table 2: Comparison between Group A and Group B according to complication after 1 week**

Follow up after 1 week	Group A (n=102)		Group B (n=100)		RR (95% C.I.)	P-value
	No.	%	No.	%		
Wound Seroma	0	0.0%	0	0.0%	0.000	1.000
Wound hematoma	10	9.8%	28	28.0%	2.86 (1.47-5.57)	0.002*
Wound infection	0	0.0%	0	0.0%	0.000	1.000
Skin separation of at least 1cm	0	0.0%	0	0.0%	0.000	1.000
Other incisional abnormalities	0	0.0%	0	0.0%	0.000	1.000

Table 3 shows a statistically significant higher frequency of Wound Seroma, Wound hematoma, and Wound infection in the usual care group than in the intra-operative glove-changing group, with a p-value (p=0.002). At the same time, there were no complications of skin separation of at least 1cm and other incisional abnormalities after three weeks, with a p-value (p>0.05).

**Table 3: Comparison between Group A and Group B according to complication after 3 weeks**

Follow up after 3 weeks	Group A (n=102)		Group B (n=100)		RR (95% C.I.)	P-value
	No.	%	No.	%		
Wound Seroma	10	9.8%	28	28.0%	2.86 (1.47-5.57)	0.002*
Wound hematoma	10	9.8%	28	28.0%	2.86 (1.47-5.57)	0.002*
Wound infection	10	9.8%	28	28.0%	2.86 (1.47-5.57)	0.002*
Skin separation of at least 1cm	0	0.0%	0	0.0%	0.000	1.000
Other incisional abnormalities	0	0.0%	0	0.0%	0.000	1.000

Table 4 shows that there was a statistically significant higher frequency of febrile morbidity (mild fever), cellulitis and prescription of antibiotics for a skin in usual care group than intra-operative glove changing group, with p-value ( $p=0.002$ ).

Table 5 shows that there is no complications after 3 weeks of secondary outcome, with p-value ( $p>0.05$ ).

Table 6 shows the risk in the Usual Care group, 28% (28/100), and in the Intra-Operative Glove Changing Group, 9.8% (10/102). The relative risk for postoperative wound complications was 2.86 (0.28/0.098) with a 95% confidence interval ranging from 1.47 to 5.57; the z-statistic is 3.082, and the associated P-value is 0.002. The conclusion is that there is a 2.86-fold increased risk in the women in the Usual Care Group than in the Intra-Operative Glove Changing Group, and this statistically significant ( $P=0.002$ ) and number needed to treat (NNT) was 5.50 and 95% C.I. (3.49 to 12.97).

**Table 5: Comparison between Group A and Group B according to secondary outcome after 3 weeks**

Follow up after 3 weeks	Group A (n=102)		Group B (n=100)		RR (95% C.I.)	P-value
	No.	%	No.	%		
Febrile morbidity	0	0.0%	0	0.0%	0.000	1.000
Cellulitis	0	0.0%	0	0.0%	0.000	1.000
Prescription of antibiotics for a skin (Stop Treatment)	10/10	100%	28/28	100%	0.000	1.000
Endometritis	0	0.0%	0	0.0%	0.000	1.000
Period of hospital stay	0	0.0%	0	0.0%	0.000	1.000
Cost	0	0.0%	0	0.0%	0.000	1.000

**Table 6: Comparison between Group A and Group B according to Postoperative wound complications**

Postoperative wound complications	Group A		Group B		RR (95% C.I.)	P-value
	No.	%	No.	%		
Yes	10	9.8%	28	28.0%	2.86 (1.47-5.57)	0.002*
No	92	90.2%	72	72.0%		
Total	102	100.0%	100	100.0%		

## Discussion:

### Our Results and their interpretation

This study revealed that postoperative wound complications were statistically significant higher among cases not subjected to change of sterile gloves 28.0% vs. 9.8%. On the other hand, no differences were noted between study groups as regard operative duration  $61.39 \pm 7.76$  vs.  $59.35 \pm 8.11$  minutes.

In this study, 3 weeks after operation, wound seroma (28.0% vs. 9.8%), hematoma (28.0% vs. 9.8%) and infection (28.0% vs. 9.8%) were statistically significant higher among cases not subjected to change of sterile gloves, with p-value ( $p=0.002$ ). On the other hand, no differences

were noted between study groups regarding postoperative skin separation and other incisional abnormalities, with p-value ( $p>0.05$ )

Also, one week after operation, febrile morbidity (28.0% vs. 9.8%), cellulitis (28.0% vs. 9.8%), and need for antibiotics for skin- or wound-related infection (28.0% vs. 9.8%), were statistically significant higher among cases not subjected to change of sterile gloves with p-value ( $p=0.002$ ). On the other hand, no differences were noted between study groups regarding endometritis, period of hospital stay, and cost, with p-value ( $p>0.05$ ).

#### Comparison of our results to other studies

Ismail et al., 2022 investigated the clinical effect of post-cesarean section wound complications after changing surgical gloves. It was a retrospective study that included 200 pregnant women undergoing elective CS at El Hussein Hospital. Their results were similar to the current study reporting that changing gloves during C-S was linked to a lower risk of infection at the incisional surgical site and a reduction in postoperative febrile morbidity [14].

The NIHR Global Health Research Unit on Global Surgery 2022 agreed with this study and reported that changing gloves and sterile instruments before fascial closure in abdominal surgery is a low-cost and simple intraoperative intervention that reduces SSI [15].

Also, Narice et al 2021 reported that changing gloves after delivery of the placenta during a cesarean section is associated with a significant reduction in the incidence of post-surgical wound complications compared with keeping the same gloves throughout the surgery [16].

Rattanakanokchai et al 2021 conducted a systematic review and meta-analysis to assess associations between changing gloves during cesarean section (CS) and postoperative infection. They reported that changing gloves during CS was associated with a decreased risk of incisional SSI, but the risks of postoperative endometritis and febrile morbidity were not altered by changing gloves [17].

Also, Hameed et al. 2020 compared the outcome of changing gloves intra-operatively by the entire team versus standard practice (no changing gloves) during a cesarean section. The results were similar to the current study. They reported that adopting changing gloves by the entire team during a cesarean section showed better outcomes in terms of wound infection and febrile morbidity compared to no changing glove practice [13].

The results of this study were comparable to a few other reported studies in terms of reduced postoperative wound infection Dhar et al 2014 [18], Beldame et al 2012 [19], Ward et al 2014 [20].

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 Palo et al 2017 [21].

Scrafford et al 2018 agreed with us and reported that intra-operative glove changing prior to abdominal closure during cesarean section significantly reduced the incidence of post-operative wound complications. Intra-operative glove changing led to a significant decrease in composite wound complications from 13.6% in the control group to 6.4% in the intervention group. Similar to our study, the median surgical time was 64 min in the control group and 66 min in the glove-change

group with no significant difference ( $p = 0.26$ ) [22]. Against us, of the individual wound complications in the composite end point considered, skin separation demonstrated the largest difference between groups (6.8% compared to 2.1%,  $p = 0.01$ ). In the same line with us, fewer participants in the glove-change group experienced febrile morbidity compared to controls.

As regard wound infective complications, four studies compared the incidence of wound infective complications when changing gloves. Wound infective complications were significantly lower in the glove changing groups. Devoor and Roopadevi, 2014 [23], Cernadas et al., 1998 [16], Scrafford et al., 2018 [22], Ventolini and Neiger, 2004

Further subgroup analysis showed that changing the gloves after delivery of placenta but not before was associated with a lower incidence of wound infective complications Devoor and Roopadevi [23], 2014, Cernadas et al., 1998 [16].

As regard endometritis, five studies, which collectively assessed a total of 1706 women, reported on the incidence of endometritis after changing gloves during a CS compared with routine care. Changing gloves intra- operatively was not associated with a significant change in the incidence of endometritis.

Three of these studies assessed glove changing before removing the placenta. Turrentine and Banks, 1996, Szatmary et al., 2004, Cernadas et al., 1998 [16], Atkinson et al, 1996, whereas the remaining two evaluated the impact of the intervention after delivery of the placenta. Further subgroup analysis based on the timing of the intervention, however, did not seem to statistically affect the incidence of endometritis Cernadas et al., 1998 [16], Szatmary et al., 2004

Three studies compared the incidence of febrile morbidity in 744 women based on whether gloves were changed during the CS or not. The distribution of participants between the intervention and control groups was similar. No statistically significant differences were identified on postoperative febrile morbidity regardless of whether the gloves were changed before and/or after delivery of the placenta. Devoor and Roopadevi, 2014 [23], Cernadas et al., 1998 [16], Scrafford et al., 2018 [22].

This finding is consistent with previous studies that evaluated infection prevention bundles for CS and found that changing gloves intraoperatively after delivery of the placenta when assessed in conjunction with other interventions such as chlorhexidine preparation, perioperative antibiotics, and removal of placenta by gentle traction might reduce the incidence of SSI Carter et al., 2017 [24] and Brinsko et al 2016 [25].

Our results differ from Cernadas et al. (1998) [16], who did not find the outcome statistically significant due to several causes, such as different study methodologies, outcomes, sample size, different medical conditions, gestational age of studied cases at time of enrollment, different sterilization techniques, different protocols of antibiotics taken, and infection control measures.

Other specialties like Urology and Colorectal, however, have not found any statistically significant differences in postoperative infective complications after changing gloves, which we think may be due to intrinsic differences in the surgical nature of CS compared with other operations Scrafford et al., 2018 [22] and Wilson et al., 2013 [26].

Even though the pathophysiology of SSI following CS remains to be fully elucidated, we hypothesized that changing gloves intraoperatively may be more effective to contain infection at a local rather than at a systemic level because it reduces contamination of the wound with commensal



flora from the vagina during surgery. Postoperative low-grade febrile episodes, on the other hand, are not necessarily infective and might represent a physiological response to surgery [27]

This would explain why changing gloves during CS may not be as effective at reducing postoperative fever as it is for wound complications. Endometritis may also be less affected by intraoperative changing of gloves because its strongest risk factors tend to occur in the antenatal period and during labor (vaginal dysbiosis, prolonged rupture of membranes, multiple vaginal examinations) Olsen et al., 2010. Therefore, interventions carried out during delivery, such as intraoperative changing of gloves, may have missed the window of opportunity [28].

Clinical implications of the study: We encourage all obstetricians to change their surgical gloves before suturing the skin in CS.

Strengths and limitations of the study: the strength point of our research is appropriate methodology and proper randomization. The limitations of our study are the relatively small number of patients and that it is a single-center study, which could lead to a statistical bias.

Recommendations for further studies: Larger numbers of patients are needed, and we recommend similar studies to be multi-centric for better results

**Conclusion:** changing sterile gloves at the time of wound closure reduce surgical site infection and associated morbidity in women undergoing elective CS.

#### Authors contributions:

All authors jointly contributed to the conception and design of the study.

**Mustafa M. Abbas:** Design of the study, helped in review of literature, revision of results and data analysis , writing the manuscript and submission to journal

**Alaa El-Din H. El-Feky;** design of the study , revision of review of literature and revision of manuscript

**Fatma H. Abd El-Aal:** registration of trial, obtaining ethical committee approval, reviewed the literature, shared in collection of Data, patient recruitment , design of the study , revision of review of literature and revision of manuscript , Design of the study, helped in review of literature, revision of results and data analysis and contributed in writing the manuscript.

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#### Study registration:

The study was registered in the Pan-African Clinical Trial

#### Disclosure of Interest

The authors declare no conflict of interest.

Ethics Approval and Informed Consent to Participate Following local regulations, the protocol gained

ethical and research approval from the Faculty of Medicine Ain Shams University FMSU MS 61/2023. We Confirm that all methods were performed according to the relevant guidelines and regulations according to the Declaration of Helsinki .

Data Sharing

The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

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Not applicable.

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**Table 1: Comparison between Group A and Group B according to Baseline characteristics**

<b>Baseline characteristics</b>	<b>Group A (n=102)</b>	<b>Group B (n=100)</b>	<b>Test value</b>	<b>P-value</b>
<b>Age (years)</b>				
Mean±SD	29.50±5.64	29.11±5.95	0.25	0.618
Range	19-44	19-41		
<b>Parity</b>				
Median (IQR)	2 (1-3)	2 (1-3)	1.689	0.195
Range	0-6	0-6		
<b>Number of CS</b>				
Median (IQR)	2 (1-3)	2 (1-3)	0.610	0.436
Range	1-4	1-6		
<b>BMI</b>				
Mean±SD	22.17±2.27	21.58±2.35	3.589	0.059
Range	18-25	18-25		
<b>Operation duration (hrs)</b>				
Mean±SD	61.39±7.76	59.35±8.11	3.650	0.057
Range	35-90	35-78		

**Table 2: Comparison between Group A and Group B according to complication after 1 week**

Follow up after 1 week	Group A (n=102)		Group B (n=100)		RR (95% C.I.)	P-value
	No.	%	No.	%		
Wound Seroma	0	0.0%	0	0.0%	0.000	1.000
Wound hematoma	10	9.8%	28	28.0%	2.86 (1.47-5.57)	0.002*
Wound infection	0	0.0%	0	0.0%	0.000	1.000
Skin separation of at least 1cm	0	0.0%	0	0.0%	0.000	1.000
Other incisional abnormalities	0	0.0%	0	0.0%	0.000	1.000

**Table 3: Comparison between Group A and Group B according to complication after 3 weeks**

Follow up after 3 weeks	Group A (n=102)		Group B (n=100)		RR (95% C.I.)	P-value
	No.	%	No.	%		
Wound Seroma	10	9.8%	28	28.0%	2.86 (1.47-5.57)	0.002*
Wound hematoma	10	9.8%	28	28.0%	2.86 (1.47-5.57)	0.002*
Wound infection	10	9.8%	28	28.0%	2.86 (1.47-5.57)	0.002*
Skin separation of at least 1cm	0	0.0%	0	0.0%	0.000	1.000
Other incisional abnormalities	0	0.0%	0	0.0%	0.000	1.000

**Table 4: Comparison between Group A and Group B according to secondary outcome after 1 week**

Follow up after 1 week	Group A (n=102)		Group B (n=100)		RR (95% C.I.)	P-value
	No.	%	No.	%		
Febrile morbidity (Mild Fever)	10	9.8%	28	28.0%	2.86 (1.47-5.57)	0.002*
Cellulitis	10	9.8%	28	28.0%	2.86 (1.47-5.57)	0.002*
Prescription of antibiotics for a skin	10	9.8%	28	28.0%	2.86 (1.47-5.57)	0.002*
Endometritis	0	0.0%	0	0.0%	0.000	1.000
Period of hospital stay	0	0.0%	0	0.0%	0.000	1.000
Cost	0	0.0%	0	0.0%	0.000	1.000

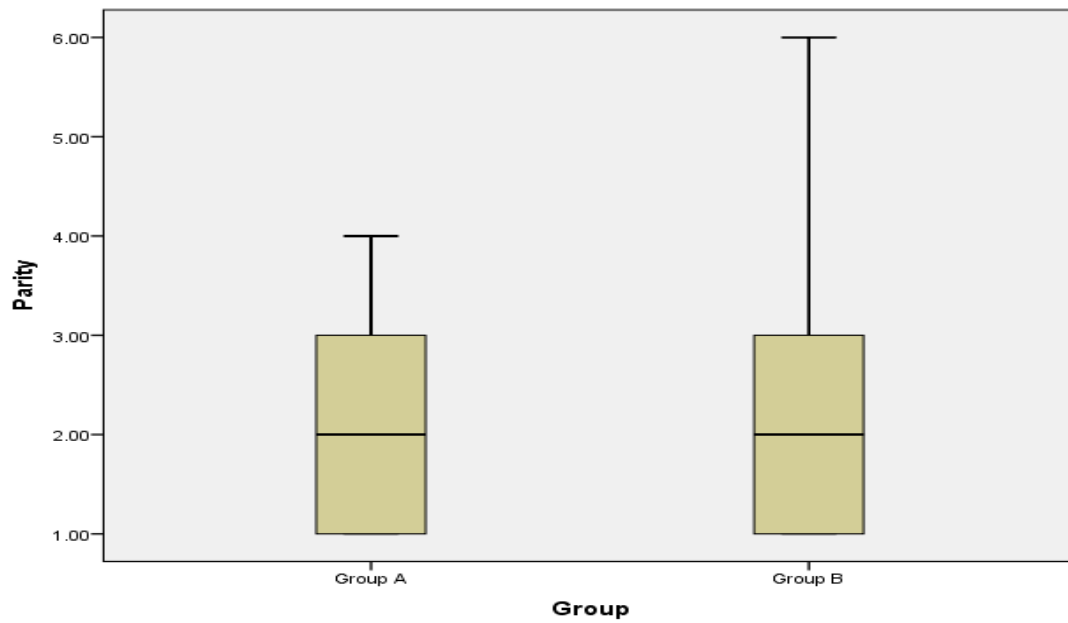


**Table 5: Comparison between Group A and Group B according to secondary outcome after 3 weeks**

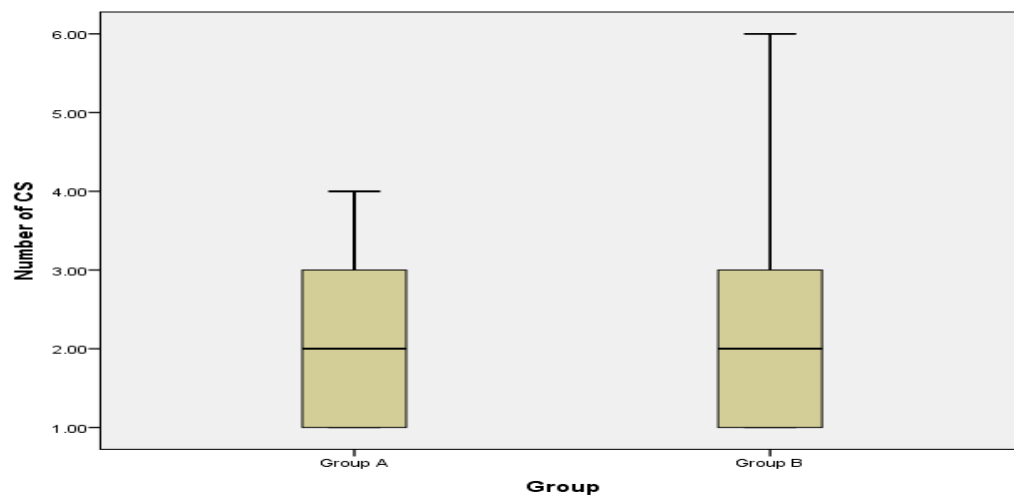
Follow up after 3 weeks	Group A (n=102)		Group B (n=100)		RR (95% C.I.)	P-value
	No.	%	No.	%		
Febrile morbidity	0	0.0%	0	0.0%	0.000	1.000
Cellulitis	0	0.0%	0	0.0%	0.000	1.000
Prescription of antibiotics for a skin (Stop Treatment)	10/10	100%	28/28	100%	0.000	1.000
Endometritis	0	0.0%	0	0.0%	0.000	1.000
Period of hospital stay	0	0.0%	0	0.0%	0.000	1.000
Cost	0	0.0%	0	0.0%	0.000	1.000

**Table 6: Comparison between Group A and Group B according to Postoperative wound complications**

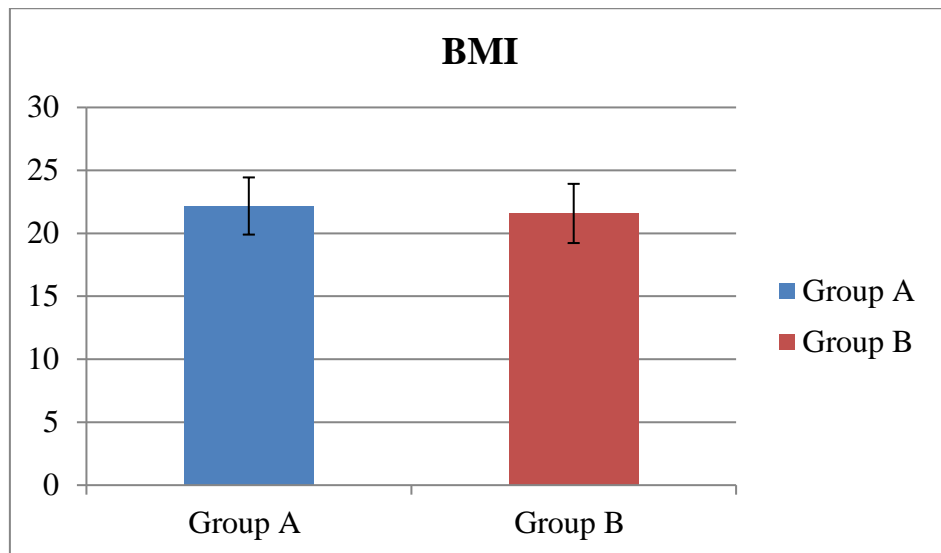
Postoperative wound complications	Group A		Group B		RR (95% C.I.)	P-value
	No.	%	No.	%		
Yes	10	9.8%	28	28.0%	2.86 (1.47-5.57)	0.002*
No	92	90.2%	72	72.0%		
Total	102	100.0%	100	100.0%		



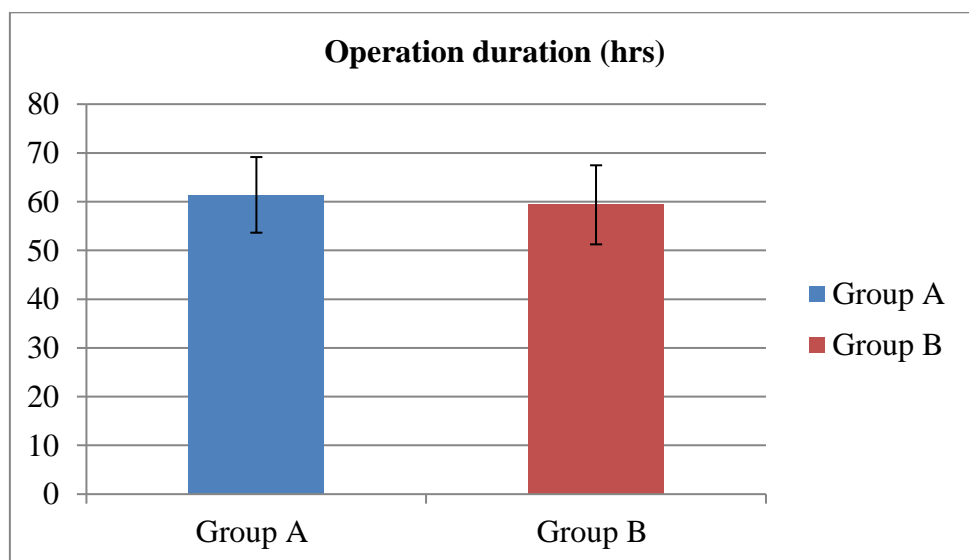
**Fig. (1):** Comparison between Group A and Group B according to Parity.



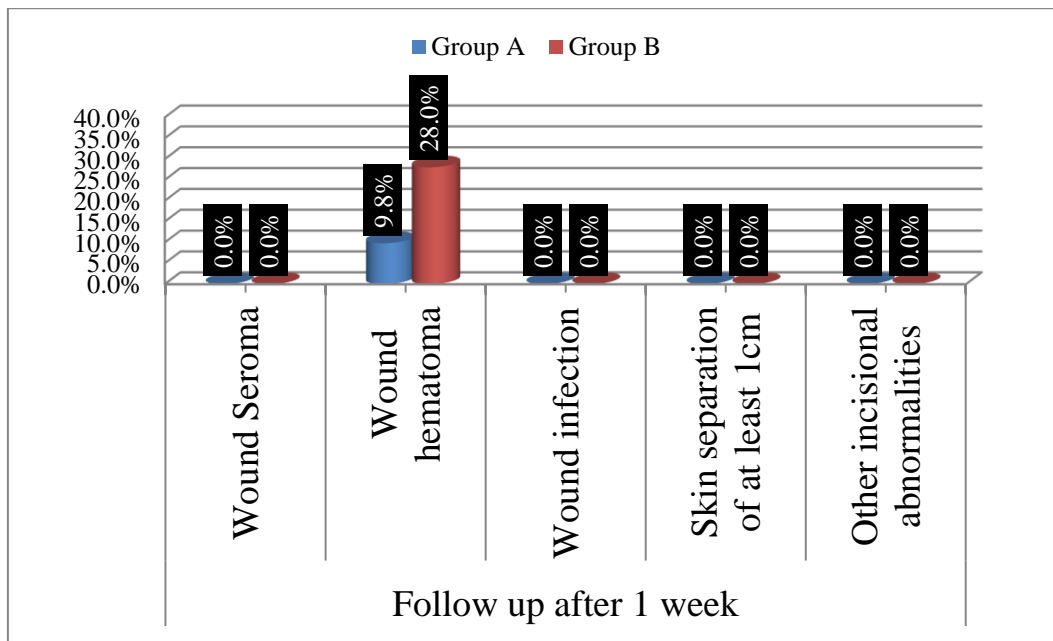
**Fig. (2):** Comparison between Group A and Group B according to Number of CS.



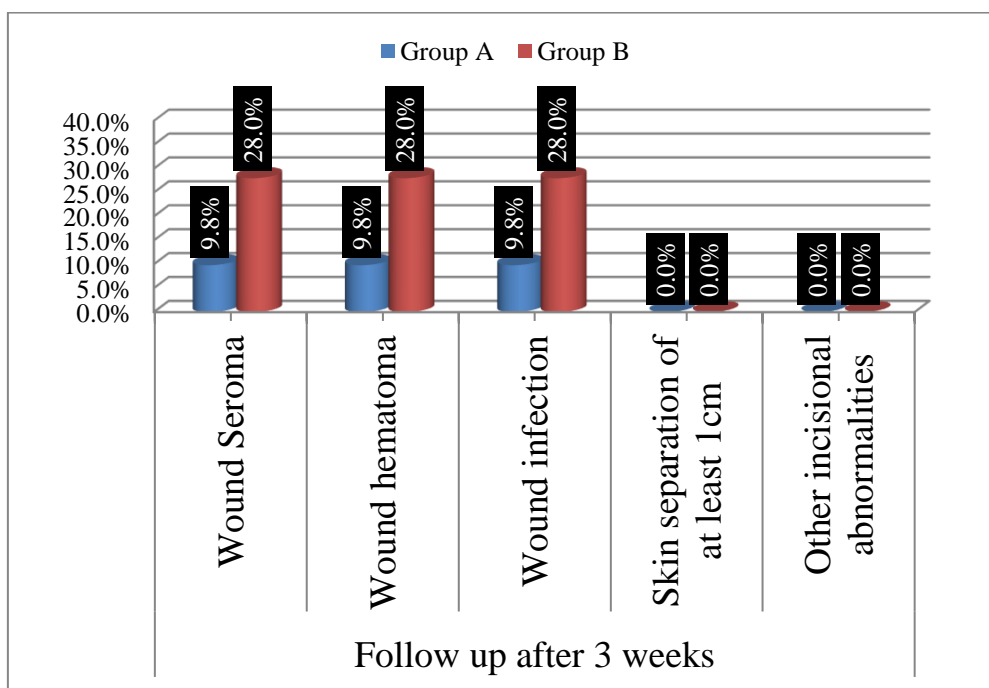
**Fig. (3):** Comparison between Group A and Group B according to BMI.



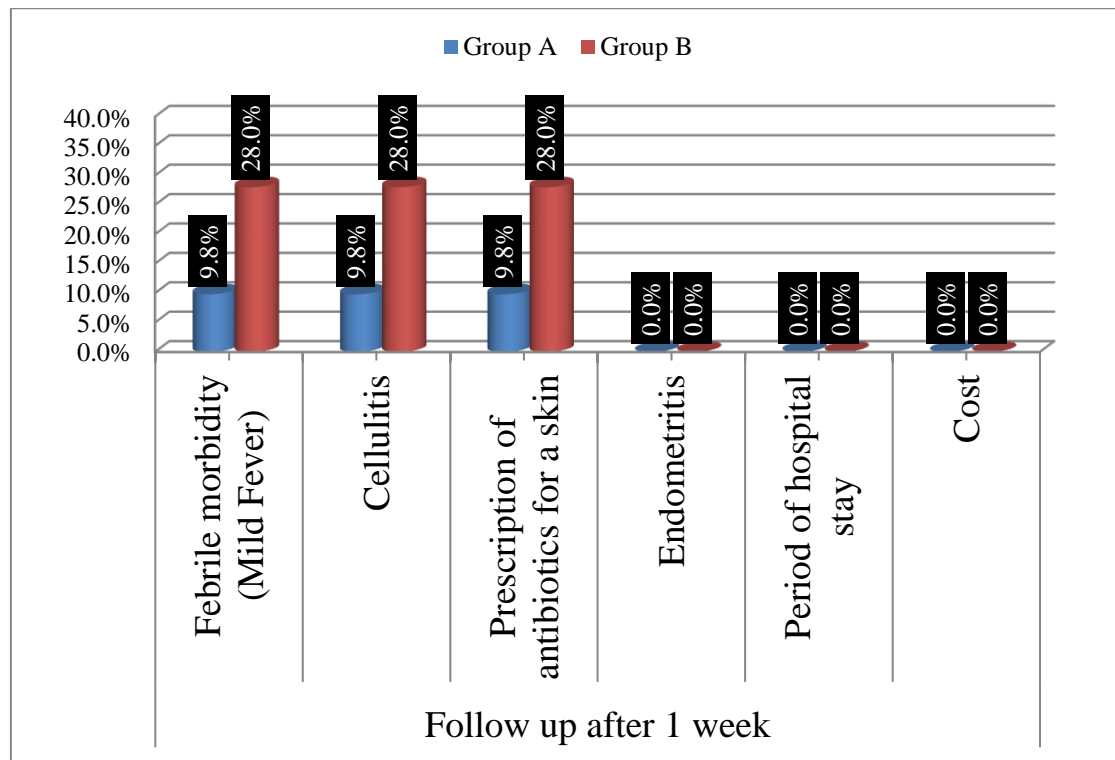
**Fig. (4):** Comparison between Group A and Group B according to Operation duration (hrs).



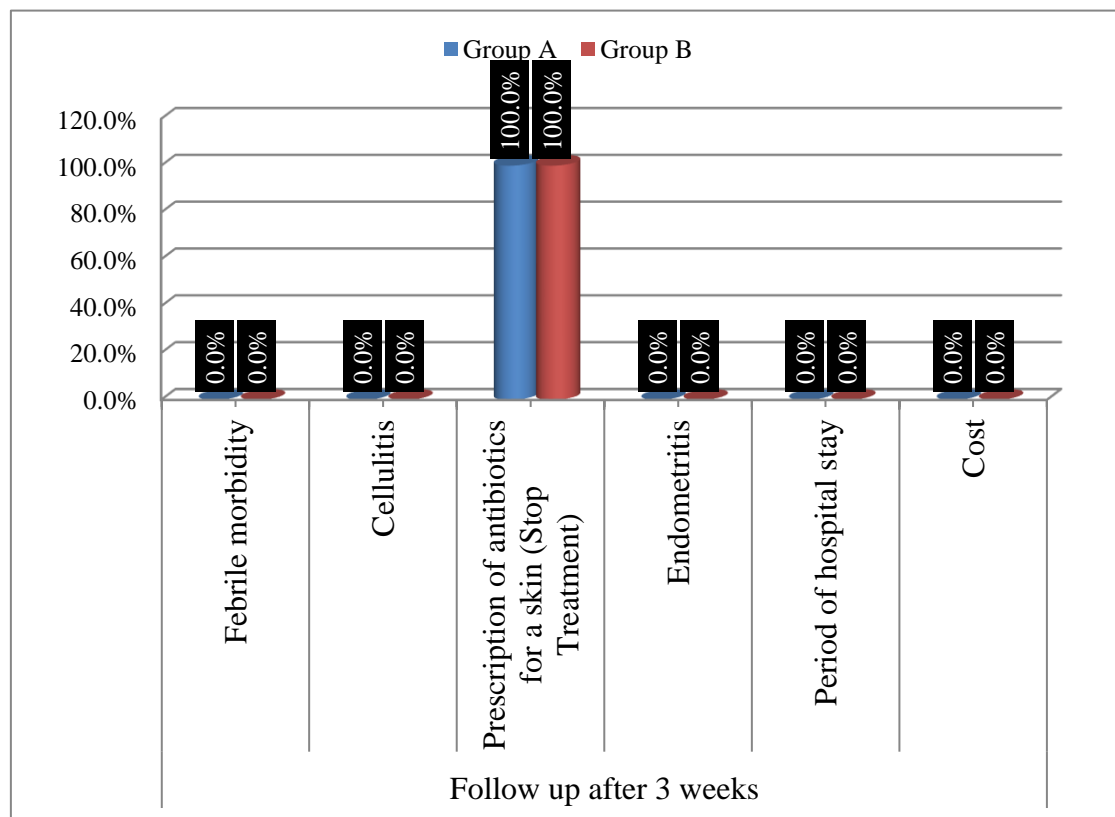
**Fig. (5):** Comparison between Group A and Group B according to complication after 1 weeks.



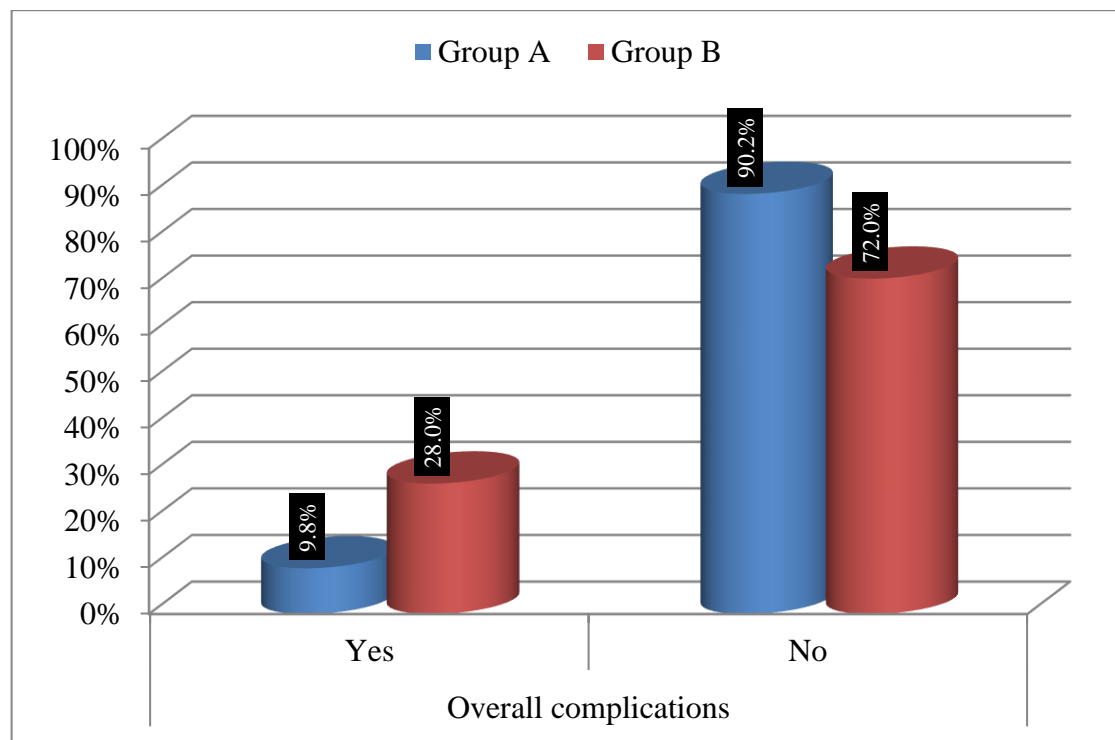
**Fig. (6):** Comparison between Group A and Group B according to complication after 3 weeks.



**Fig. (7):** Comparison between Group A and Group B according to secondary outcome after 1 week.



**Fig. (8):** Comparison between Group A and Group B according to secondary outcome after 3 weeks.



**Fig. (9):** Comparison between Group A and Group B according to Febrile morbidity.