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Are Higher Order Caesarean Sections More Risky Compared to Lower Order Caesarean Sections?

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Abstract

Background: Saudi Arabian culture encourages large families, and therefore, it's not uncommon to see women undergo several Caesarean Sections (CS). There is disagreement in the literature regarding the actual risks mothers face with higher order CSs.

Aim: This study aims to explore whether more frequent higher order CSs result in more complications.

Materials and methods: This study was a retrospective cohort study conducted at the Mother and Child Hospital in Burayda, Al Qassim, Saudi Arabia, between 31st January and 31st March 2012.

Group 1 had undergone three or fewer CSs, and Group 2 had undergone more than three CSs. Comparisons between the mean values of the quantitative variables were calculated using the Student *t* test for quantitative data, and a chi-square for qualitative data. The test of significance was set at 0.05.

Results: The CS rate for this time period was 28.6%. In all, 193 (56.3%) women were in Group 1, and 150 women (43.7%) were in Group 2. Sixty-nine women (46%) had four previous CSs; 58 (38.7%) had five; 20 (13.3%) had six; and three women (2%) had seven previous CSs. The presence of complications, such as intra operative adhesions, adherent placenta, placenta previa, postpartum haemorrhage (PPH), wound infection, urinary tract infection and deep vein thrombosis, were higher in Group 2 ($P<0.05$).

Conclusions: Higher order CSs are associated with higher complication rates. The precise scale of the trend of performing higher order CSs needs to be studied, and appropriate strategies at the national level should be implemented to encourage family planning.

Keywords: Caesarean section; Higher order; Risks; Saudi Arabia

Introduction

The number of Caesarean Sections (CSs) has continued to increase worldwide in the last three decades [1-3]. Saudi Arabian culture, like that of most countries in the region, encourages having a large family, and therefore, it is not uncommon for Saudi women to undergo six or seven CS procedures [4].

Within the literature, there is disagreement regarding the actual risks women face with multiple CSs. Some studies report no increased risk whatsoever, and consequently, women are encouraged to pursue more pregnancies [5,6]. CSs, then, are becoming increasingly acceptable [7].

However, in light of the conflicting studies and the rapid increase in performed CSs, especially in Saudi Arabia, this study was designed to compare the short-term complications and outcomes of CSs in women who have had more than three higher order CSs with women who have had three or fewer lower order CSs.

Materials and Methods

This was a retrospective cohort study that included all women admitted for CSs at the Mother and Child Hospital (MCH) in Buraydah, Saudi Arabia, from January 31st to March 31st, 2012. MCH is a major medical facility in the region with annual delivery rates of almost 10,000 newborns. All women who had undergone three or fewer CSs were included in Group 1 (control group), and those who were undergoing their fourth (or more) CS were included in Group 2 (case group). All of the CS's were lower segment caesarean sections conducted by consultants or senior registrars.

The data collected included maternal age, parity, placental location on the ultrasound, gestation at delivery, duration of surgery, presence of adhesions (of any degree; and was categorised as "0" if no adhesions were found and "1" if adhesions were present), intraoperative and postoperative complications, and the number of postoperative days spent in the hospital. Chest infections (individuals with cough, sputum and fever), urinary tract infections (UTI) (burning micturation, frequency, urgency and positive culture with bacterial colony count of 10^3/ml, Pyrexia of Unknown Origin (PUO) (fever above 38.3°C during hospital stay without attributable cause), and wound infection (redness, swelling, puss-like discharge or indurations of wound) were also observed. Scar dehiscence was defined as the presence of a window in part of the uterine scar with intact membranes. All data were kept anonymous, and approval from a local ethical committee was obtained prior to collection.

Statistical study

The data were subsequently coded, tabulated and entered into a database on a laptop computer. Statistical analyses were then carried out using the SPSS statistical software (version 19) for Windows 7. Numbers and percentages were calculated for qualitative variables, and the mean and standard deviation were calculated for quantitative data. Comparisons between the mean values of the quantitative variables

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were calculated using the Student *t* test, and a chi-square was used for qualitative data. The test of significance was set at 0.05.

Results

During the time this study took place, there were 1,200 deliveries, 343 of which were CSs (28.6%). Of the 343 CS patients, 193 (56.3%) had undergone three or fewer CSs (Group 1), and 150 (43.7%) had undergone their fourth (or more) CS (Group 2).

The majority of women with a history of three or more previous CSs were admitted for planned or elective CS. Emergency CSs were conducted in cases of foetal distress or a failed progress of labour during an attempted trial of vaginal delivery. The hospital's policies did not allow a woman with a history of even one previous CS to be induced if she did not go into spontaneous labour.

Patients in Group 2 were distributed as follows: 69 (46%) had four previous CSs; 58 (38.7%) had five; 20 (13.3%) had six; and three (2%) had seven previous CSs. Table 1 shows maternal demographic characteristics, surgery details, and birth weights in Groups 1 and 2. There were statistically significant differences between the two groups in mean maternal age, gestational age, hospital stay, birth weight, and duration of surgery ($P<0.05$).

Differences in intra operative complications, several of which were significant, are shown in Table 2. The presence of placenta previa, scar dehiscence and caesarean hysterectomy was higher in Group 2 than it was in Group 1 ($P<0.05$). No significant differences were found among the other variables.

Table 3 shows postoperative complications among the two groups. Chest infections, urinary tract infections, pyrexia of unknown origin and wound infections were significantly higher in Group 2. A low Apgar score in the first minute indicated that medical treatment for

Characteristic	Group 2 (n=150)	Group 1 (n=193)	Significance *P*
Maternal age in years (mean ± SD)	35.8 ± 4.31	31.6 ± 5.23	*P* = 0.000 **S**
Parity (mean ± SD)	5.24 ± 1.06	3.40 ± 2.25	*P* = 0.000 **S**
Gestational age at delivery in weeks (mean ± SD)	36.5 ± 1.84	37.7 ± 2.10	*P* = 0.000 **S**
Hospital stay* (mean ± SD)	1.81 ± 0.866	1.67 ± 0.856	*P* = 0.000 **S**
Birth weight in kilo grams (mean ± SD)	2.84 ± 0.715	3.39 ± 2.91	*P* = 0.024 **S**
Number of abortions (mean ± SD)	0.93 ± 1.210	0.84 ± 1.14	*P* = 0.494 **NS**
Duration of surgery in hours (mean ± SD)	2.13 ± 0.594	1.72 ± 0.844	*P* = 0.000 **S**

Table 1: Demographic characteristics, Surgery details and Birth weights.

Maternal Complication	Group 2 (n=150)	Group 1 (n=193)	Significance *P*
Bladder Injury	4 (2.6%)	6 (3.10%)	X^2 = 0.058 *P* = 0.809 **NS**
Cesarean hysterectomy	4 (2.6%)	0 (0%)	X^2 = 5.207 P = 0.022 **S**
Adherent placenta	136 (90.6%)	181 (93.78%)	X^2 = 2.436 *P* = 0.296 **NS**
Emergency Caesarean Section	101 (67.3%)	97 (50.2%)	X^2 = 10.083 *P* = 0.001 **S**
Placenta previa	21 (14%)	9 (4.6%)	X^2 = 9.219 *P* = 0. 002 **S**
Scare dehiscence	113 (75.3%)	50 (25.9%)	X^2 = 82.681 *P* = 0.0001 **S**
Adhesions	150 (100%)	193(100%)	*No difference*
Apgar Score Zero	3 (2%)	0 (0%)	X^2 = 3.894 *P* = 0.0845 **S**

SD: Standard Deviation; NS: Not Significant; S: Significant

Table 2: Comparison of Intraoperative Complications.

Characteristic	Group 2 (n=150)	Group 1 (n=193)	Significance *P*
PPH	18 (12.0%)	23 (11.9%)	X^2 = 0.001 *P* = 0.981 **NS**
DVT	6 (4.0%)	8 (4.14%)	X^2 = 0.005 *P* = 0.946 **NS**
Chest infection	29 (19.3%)	6 (3.10%)	X^2 = 24.248 *P* = 0.000 **S**
UTI	24 (16.0%)	6 (3.10%)	X^2 = 17.574 *P* = 0.000 **S**
PUO	26 (17.3%)	11 (5.69%)	X^2 = 11.870 *P* = 0.001 **S**
Wound infection	24 (16.0%)	12 (6.21%)	X^2 = 8.598 *P* = 0.003 **S**

Ns: Not Significant; S: Significant
Uti: Urinary Tract Infection; Puo: Pyrexia of Unknown Origion,
Pph: Postpartum Hemorrhage; Dvt: Deep Vein Thrombosis

Table 3: Comparison of Postoperative Complications.

the baby was required [8,9]. In Group 2, three babies were delivered stillborn, but in Group 1, all delivered babies had an Apgar score of seven or above.

Discussion

Although maternal death as a result of CS is now infrequent, there is conflicting evidence regarding possible short- and long-term consequences of the increased number of CSs on women [10,11].

As a matter of medical choice, following a second or third CS, many women in developed countries elect to undergo a tubal ligation in order to prevent future pregnancies [12]. A fourth or subsequent CS in considered higher order [5]. Due to cultural factors, among others, grand multi parity is common for Saudi women, which increases the need for CSs, regardless of the literature warning of potential negative health consequences of CSs [13].

Table 2 shows that the risk of adherent placenta was very high in both groups, which is in contrast to what has previously been reported in the literature [14]. The subcategories were not studied separately, so it is possible that adherent placenta was overestimated. However, this need to be examined in a separate study as the risk factors for placenta accrete in Saudi women may not be as prevalent for women worldwide. Saudi women are generally more at risk due to cultural pressures for grand and great-grand multiparity. Women also have miscarriages between CSs, followed by evacuation and curettages. Family planning education and birthspacing measures, even after multiple CS, are essentially non-existent. Furthermore, tubal ligations following CSs are rarely performed.

In the current study, scar dehiscence was 75.3% in Group 2 versus 25.9% in Group 1, with a p-value of less than 0.001 (Table 3). However, no cases of symptomatic uterine rupture or maternal mortality were identified in our study. The literature describes significantly lower rates that range from 1% to 10% in women undergoing a fifth to a ninth CS [15,16]. This higher prevalence in higher order CSs could have been because the majority of women who had had more than three CSs were admitted for early labour for an emergency CS. These results were initially attributed to the small sample size of this study (343 total patients), but at least one previous study found a higher incidence of scar dehiscence using a study population smaller than 343 individuals [16]. It might have been possible because women were presenting during labour and had not been admitted for an elective CS.

The prevalence of bowel and bladder injuries observed in this study appears to be consistent with previous studies [16]. In this study, there was no significant difference between the two groups in regards to adhesions (Table 3). Adhesions of varying degrees were present in repeat CSs. These results are not surprising as repeated surgery (of any type) is often associated with adhesion formation [17].

This study also found a higher prevalence of placenta previa in the higher order group. Previously, studies such Rashid et al. (2004) found no difference in the incidence of placenta previa between higher order repeat CSs and lower order repeat CSs [5,12]. In contrast, other researchers conclude that the incidence of placenta previa increases with the number of CSs [18,19].

Only individuals from Group 2 reported any incidents of caesarean hysterectomy, and all of these were carried out as a consequence of uncontrolled bleeding from a placenta accrete (Table 3).

Postoperative chest infection, pyrexia of unknown origin, wound infection and urinary tract infection were also found to be higher in the higher order CS group (Table 3). In Group 2, three babies were delivered stillborn, whereas all babies were delivered alive in Group 1.

Although there are risks associated with higher order CSs, there is still no demarcation that establishes a definite increased maternal risk. Consequently, the medical community, in the absence of clinical trials, cannot agree on a safe number of CSs [20]. Despite the frequency of this procedure, CSs, just like any other surgical procedure, bear the risk of complications and potential medical issues for both mother and child. Consequently, relevant planners and officials in Saudi Arabia's hospitals should adopt suitable strategies, such surgeon training and providing facilities for vaginal delivery after caesarean section, in order to reduce unnecessary CSs, thereby potentially improving the health of mothers and babies. Indeed, recent research indicates that vaginal birth after a CS is a viable option [21]. In addition, birth control or birth spacing should be considered.

The present study is limited in that it focuses on only one hospital in Saudi Arabia, yet the conclusions are in line with those of a significant amount of the literature. Specifically, the data collected indicates that adhesions, bladder injuries, and caesarean hysterectomies occur more commonly in women who have had three or more previous CSs. In the future, an effort should be made to conduct larger prospective trials (perhaps in multiple hospitals) to confirm these findings.

Conclusion

In conclusion, higher order CSs pose significant risks. Family planning should be encouraged in an effort to limit these higher order CSs.

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