ORIGINAL ARTICLE

Maternal Morbidity of Higher Order Cesarean Sections: an analytical study at Sir Ganga Ram Hospital Lahore

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ABSTRACT

Background: Complications of higher order cesarean sections especially major degree placenta previa and placenta previa accrete are the biggest challenges obstetricians are facing worldwide. Maternal complications e.g. placenta previa/accreta, dense intra-abdominal adhesions and bladder injury increase as the number of repeat cesarean section increases.
Aim : To analyze maternal complications associated with higher order caesarean section.
Setting: Department of Gynecology and Obstetrics, Sir Ganga Ram hospital, Lahore.
Duration: 6 months (July to December 2017).
Sample size: 100 pregnant females with at least one previous cesarean section.
Sampling technique: Non probability consecutive sampling.
Methodology: This Analytical study was conducted on patients undergoing elective and emergency cesarean sections were included in the study and divided into two groups; lower order (3 or less than 3) and higher order (4 or more than 4) cesarean sections. Complications like formation of adhesions, placental abnormalities, scar rupture, emergency hysterectomy, bladder injury & admission to intensive care unit of both groups were recorded on a proforma & compared between the two groups.
Data Analysis: The data was analyzed through SPSS version 20. Student t test was used for analysis of quantitative data and chi square for qualitative data. The p-value of <0.05 was taken as statistically significant.
Results: Maternal complications like frequency of dense adhesions 49(98%) versus 42(84%), placenta previa 24(48%) versus zero (0%) and bladder injury 12(24%) versus 1(2%) remained significantly high (p-value <0.05) in study as compared to control group respectively.
Conclusions: Higher order cesarean are associated with significantly increased risk of maternal complications as compared to low order cesareans.
Key points: maternal morbidity, higher and lower order, cesarean section

INTRODUCTION

The rate of C-sections is increasing dramatically along with a parallel increase in maternal morbidity and mortality. Dealing with serious maternal complications of higher order cesarean section is one of the biggest challenges obstetricians are facing today[1].

Globally 15% of births are recorded to be done by abdominal route[2,3]**.** The risk of serious maternal complications e.g., placenta previa, placenta accrete and dense adhesions increases as the number of repeat cesarean increases. The frequency of placenta previa increases from 10/1000 with previous one cesarean section to 28/1000 with 3 or more than 3 cesarean deliveries. Similarly, the risk of placenta previa accrete increases from 3.3-4% with previous no cesarean section to 50-67% with previous 3 or more than 3 cesarean births[4,5,6,7].

Risk of formation of dense adhesions increases as the number of repeat cesarean increases resulting in increase in risk of bladder and bowel trauma[1,8,9]**.** These figures stress on the need to reduce primary cesarean section rate and increase the rate of trial of birth after previous one cesarean[10].

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Literature review[1-11] shows controversial results regarding upper limit of cesarean section and maternal complications of higher order cesarean section. Some studies[1-10] concluded increased risk of maternal complications associated with higher order cesarean section but few studies show no significant difference in maternal complications between lower order and higher order cesarean sections[11].

Sir Ganga Ram Hospital is a tertiary care hospital where majority of high risk patients referred from primary and secondary health care level as well as from home deliveries and private sector are managed. Data regarding maternal complications of higher order cesarean section at local level is scarce. There is a need to address this issue and measures must be established to reduce maternal mortality and morbidity associated with higher order cesarean section. The higher order cesarean sections should be considered as high risk surgeries and hence must be done under supervision of senior staff. So, this study was conducted to find out maternal complications of higher order cesareans in our resource poor and overcrowded set up at Sir Ganga Ram Hospital Lahore. This will add to existing body of knowledge as well as open new doors for further research in this area.

MATERIALS & METHODS

This was an analytical study carried out in Department of Gynecology and Obstetrics Sir Ganga Ram Hospital Lahore between July and December 2017. The main objective was to study maternal complications of higher order cesarean sections. After taking informed consent, total of 100 (keeping power of test at 95% and margin of error at 5%) pregnant females with at least 1 previous cesarean section were included in study by non-probability consecutive sampling. Patients from emergency as well as elective list were included in the study.

Ethical approval: This research was approved by institutional review board of Fatima Jinnah Medical University, Sir Ganga Ram Hospital Lahore. Informed consent from all participants was taken at the start of study.

Maternal morbidity: For this study, maternal morbidity is defined in terms of occurrence of one of the following parameters: presence of adhesions, uterine dehiscence, uterine rupture, increased operative time, placenta previa and placenta accrete, hysterectomy, operative injury (bladder, bowel),and excessive blood loss, admission to intensive care, wound dehiscence.

Lower order cesarean section is defined as 3 or less than 3 cesarean sections.

Higher order caesarian is 4 or more than 4 previous cesareans sections.

All women with

1).age between 20-45 years

2). having at least one previous cesarean section

3).no previous classical cesarean section and

4).no previous non-cesarean abdominal surgery were included in study.

All patients undergoing first cesarean section, have previous classical scar and all those having previous non-cesarean abdominal surgery Were excluded from study. Sample was equally divided into two groups: Fifty women who had to undergo their 4rth or above caesarean section were included in the study group, while control group comprised of fifty women who had to go through their 2nd or 3rd cesarean done electively or in emergency. All higher order cesarean sections were performed under supervision of senior obstetric staff 9senior registrars and consultants). General surgeons and urologist were involved in cases of bowel and bladder injury respectively. All higher order cesarean sections performed on elective list were scheduled between 37-38 weeks of pregnancy due to risk of silent scar dehiscence and rupture. A proforma was filled which included the following information:

Demographic and clinical features including maternal age, gestational age (weeks),presence of placenta previa and placenta previa accreta on ultrasound and Doppler studies, mode of operation whether elective or emergency, type of uterine incision, type of anesthesia used and whether tubal ligation was performed at the time of caesarian.

Intra operative and post-operative complications including presence & severity of adhesions, condition of lower uterine segment, placental abnormalities (placenta previa and placenta accrete),rupture of scar, incidence of caesarean hysterectomy, bladder or bowel injury, admission to intensive care unit and maternal mortality were noted and entered on a proforma by the surgeon.

Data analysis: The data was entered and analyzed through SPSS version 20 for windows. Numerical variables were presented as mean and standard deviation while categorical values presented as number and percentage. Student t test was used for analysis of quantitative data and chi square test for analysis of qualitative data. The p-value of <0.05 was taken as statistically significant.

RESULTS

Total of 100 women were included in the study. Although the rate of complications remained significantly higher in study as compared to control group, no maternal death was recorded in any group. Bilateral tubal ligation was done in all higher order cesarean sections after taken consent from patients and their husbands.

Out of 100 participants, 50 were of higher order (study group) and 50 of lower order (control group) cesarean sections. In study group, out of 50 women, 39(78%) were previous 4 & 11(22%) previous 5 cesarean sections. Booked patients were 41(82%) done on elective list while 9(18%) were unbooked and were performed in emergency for problems like labor pains and vaginal bleeding in study group. In control group, out of 50 participants, 32(64%) were previous 1 & previous 2 and rest were previous 3 cesarean sections. Booked participants were 36(72%) operated on elective list while the rest were unbooked and operated in emergency for complaints of labor pains and vaginal bleeding. Table 1 shows maternal characteristics i.e., age and parity.

Mean age of participants was 29.48 & 27.28 years in study and control groups respectively.

Maternal complications (Table 2) like frequency of dense adhesions 49(98%) versus 42(84%), placenta previa 24(48%) versus zero (0%) and bladder injury 12(24%) versus 1(2%) remained significantly high (p-value <0.05) in higher order cesarean as compared to lower order cesarean group respectively. In the study group, 3 patients who had to undergo emergency hysterectomy due to placenta previa (2) and morbidly adherent placenta (1) were admitted in high dependency unit.

Table 1: Maternal Characteristics

Study group		N	Mean	Std. Deviation	Std. Error Mean
Parity	Higher order C-section	50	4.60	.808	.114
	Lower order C-section	50	1.70	.814	.115
Age	Higher order C-section	50	29.48	2.720	.385
	Lower order C-section	50	27.28	1.807	.256

Table 2: Maternal complications of cesarean section in both groups

Maternal Complications			Study groups		Total	P-value
			Higher order C section	Lower order C section		
Presence of adhesions	No	Count% within Presence of adhesions	1(11.1%)	8(88.9%)	9(100%)	0.015
	Yes	Count% within Presence of adhesions	49(53.8%)	42(46.2%)	91(100%)	
Bladder injury	No	Count% within Bladder injury	38(47.3%)	49(56.3%)	87(100%)	0.001
	Yes	Count% within Bladder injury	12(92.3%)	1(7.7%)	13(100%)	
Placenta Previa	No	Count% within Placenta Previa	26(36.1%)	46(63.9%)	72(100%)	0.000
	Yes	Count% within Placenta Previa	24(85.7%)	4(14.3%)	28(100%)	
Placenta Previa accreta	No	Count% within Placenta Previa accreta	39(43.8%)	50(56.2%)	89(100%)	0.000
	Yes	Count% within Placenta Previa accreta	11(100%)	0	11(100%)	
Uterine rupture or dehiscence	No	Count% within Uterine rupture or dehiscence	37(43.5%)	48(56.5%)	85(100%)	0.002
	Yes	Count% within Uterine rupture or dehiscence	13(86.7%)	2(13.3%)	15(100%)	
Emergency hysterectomy	No	Count % within Emergency hysterectomy	41(45.1%)	50(54.9%)	91(100%)	0.001
	Yes	Count % within Emergency hysterectomy	9(100%)	0	9(100%)	

DISCUSSION

Obstetricians are facing increasing difficulties while performing higher order cesarean sections due to serious complications associated with them especially presence of dense adhesions and morbidly adherent placenta. Placenta previa accrete, increte and percreta are the most life threating emergencies obstetricians have to manage. The leading indication of a repeat cesarean section is a previously scarred uterus emphasizing on the need to reduce frequency of primary cesarean section.

Globally no upper or lower limit of number of cesarean section could be set due to sociocultural differences. In developed world, size of family has been reduced to 2-3 with wide spread use of family planning methods and hence number of repeat cesarean section is also reduced to 2-3. On the contrary, family size in most of Asian, African and Middle East countries is large due to religious and socio-cultural influences and accordingly number of repeat cesarean section is on an increase and is considered to be one of reason of not achieving Millennium Development Goals of reducing maternal mortality and morbidity in these countries.

Conflicting reports have been recorded in literature regarding maternal complications of higher cesarean sections. Some[12,13,14] have recorded increasing trend in maternal morbidity and mortality with few exceptions recorded in Middle East countries where some studies[11] have shown no difference in maternal morbidity and mortality between higher and lower order cesarean sections. In some of other studies, no significant difference was found between higher order and lower order cesareans except risk of adhesions[13,15,16].

This study is carried out in Sir Ganga Ram Hospital Lahore, one of the most overcrowded tertiary care hospital receiving high risk obstetric patients from primary as well as secondary health care levels & private sector. In this study, all maternal complications were recorded to be significantly higher in study group (higher order) as compared to control group (lower order cesareans). The main difficulty recorded is presence of dense adhesions in almost all higher order cesarean sections. Presence of dense adhesions is responsible for bladder (12% versus 1%) in study and control group respectively. More over presence of dense adhesions increased operation time, difficulty in extracting the baby from the uterus and increased demand for consultant to attend emergency. These results coincide with results of other studies conducted on this issue[17 ,18]. In one study authors attributed increased risk of adhesions formations in higher order cesareans to individual factors rather than higher order of cesarean section[19].

Abnormal placentation and placental invasion of uterus resulting in morbidly adherent placenta are life threatening obstetric complications. The most important risk factor is raising number of cesarean sections. Results of our study show increase in the risk of low lying placenta, placenta previa and placenta previa accrete as the number of multiple repeat cesarean section increased. This difference remained significantly higher (p-value <0.05) in study as compared to control group. Difficulties were encountered while separating very thinned out lower uterine segment from bladder in cases of morbidly adherent placenta resulting in bladder injury. These results coincide with results of other studies on this subject[17].

Rupture of a scarred uterus is another life threatening complications in obstetrics. This can also occur as asymptomatic scar dehiscence (formation of a window in uterine scar with intact membranes bulging through it).There is gradual thinning of uterine wall at the scar site with increasing number of cesarean section. In our study, risk of scar dehiscence and scar rupture remained high in higher order cesarean section especially after previous 5 cesarean sections. Scar dehiscence was recorded in higher order cesarean sections even without labor pains as recorded in some other studies[13].

Risk of emergency hysterectomy increases especially in cases of higher order cesarean sections with placenta Previa, placenta previa accrete and uterine rupture. In our study frequency of emergency hysterectomy remained high (9 versus none) in study group as compared to control group. Results of our study coincide with results reported in other studies[13-15]. In one study[20], however, author has recorded only increased frequency of adhesions in study group while there was no difference in the frequency of other complications like placenta previa, morbidly adherent placenta, scar rupture and emergency hysterectomy between higher and lower order cesarean section.

Some studies[21,22] conducted at national level show rising trend in cesarean section in Pakistan but there is no study on the risks associated with increasing number of cesarean section. In resource poor set ups, cost effective measure may be used to reduce cesarean section rate and

maternal complications of higher order cesarean section cesarean section[23].

As obstetricians are facing challenges in dealing with complications of higher order cesarean section especially major degree placenta prevail and placenta preview accrete, there is dire need to conduct studies at national level to address this issue and recommendations may be given based on results of such studies regarding how to reduce cesarean section rate and frequency of higher order cesarean section as well as protocols may be established how to deal with complications of higher order cesarean section.

CONCLUSIONS

Higher order cesarean sections are associated with increased risks of serious maternal complications like morbid adhesions, placenta previa, morbidly adherent placenta, bladder injury, scar dehiscence/rupture and emergency hysterectomy.

Recommendations: Because of increased risk of lethal maternal complications associated with higher order cesarean section, there is great need to reduce overall rate of cesarean section. Frequency of primary cesarean sections should be reduced by proper management of labor in primigravida. The frequency of vaginal birth after cesarean sections (VBAC) should be increased in patients who fulfill the criteria for VBAC. There is dire need to reduce family size with wide spread use of family planning methods.

Protocols should be set up to operate higher order cesarean sections e.g. they should be done by senior obstetricians with involvement of multidisciplinary team to handle complications like placenta previa, morbidly adherent placenta, uterine rupture and bladder injury.

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