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Comparative study of maternal morbidity in primary and repeat caesarean section

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Abstract
Background: Caesarean section (CS) is the most common obstetric operative procedure worldwide with a continuously increasing incidence for the last couple of decades, giving the women, an obstetric status of "previous caesarean section. Hence here is a study to note the increasing incidence of complications as the number caesarean sections increase.
Objectives: To study intra operative and postoperative maternal morbidity up to end of 1stweek in primary and repeat caesarean section in singleton pregnancies.
Materials & Methods: This is a hospital based observational prospective clinical study of 100 primary and 100 repeat caesarean sections in term singleton pregnancies.
Results: Present study was performed on randomly selected 200 cases of which 100 cases are primary and 100 cases are repeat caesarean. In our study incidence of Caesarean section was 33%, among them Repeat Caesarean accounted for 42.5%. The highest prevalence of caesarean was seen in age group of 23-27yrs (49%) and mean age was 27.5yrs. In our study highest incidence of complications was observed in women who underwent previous two caesarean sections, of which adhesions were observed in 36.5%, in primary-0%, 1st repeat-38%, 2nd repeat-72%. mean loss of Hb in primary-1.00, 1st repeat-1.07, 2nd repeat-1.47 and P-value-<0.0001(Highly Significant).
Conclusion: Maternal morbidity is definitely high as the number of caesarean sections increase. The increasing trend towards caesarean section should be brought down by educating the patients about need for good antenatal care, correction of anemia, need of last few visits to a tertiary level centre in order to decide the mode of delivery. Proper counseling of the women should be done for spacing of pregnancies in previous caesarean cases & there would be better chance for a successful VBAC later.

Keywords: Caesarean section, postoperative complications, Uterine

Introduction
Childbirth is a universally celebrated natural event; yet for many thousands of women in India, it is becoming a matter of concern due to the over medicalization of their bodies. According to the World Health Organization's (WHO) guidelines, modified in 1994, the Caesarean birth rate in any population group should range between 5% and 15% (WHO 1994) [1]. However, currently the Caesarean birth rates in many developed and developing countries far exceed the tolerable limit specified by the WHO and indicate an unnecessary use of this intervention. The word caesarean is derived from the Latin word "caedare," which means "to cut". the availability of blood transfusion. It is natural, therefore, that the indications for this. "Caesarean section – a lethal operation?" was the title of the William Hunter Memorial Lecture in Glasgow in 1960, in which disasters precipitated by ill-chosen indications, unsatisfactory operating conditions, indifferent or inexperienced operators and bad timing were reviewed [1]. Although the operation is much safer today, the indications and rates of caesarean section continue to be the subject of review, since the complication rates are nevertheless far in excess of those with vaginal delivery. Caesarean section (CS) is the most common obstetric operative procedure worldwide with a continuously increasing incidence for the last couple of decades, giving the women, an obstetric status of "previous caesarean section. The 2012 U.S. caesarean delivery rate was unchanged at 32.8%. The caesarean rate rose nearly 60% from 1996 to 2009, declined slightly from 2009 to 2010, and has been stable since then. Across Europe, there are significant differences between countries: in Italy the Caesarean section rate is 40%, while in the Nordic countries it is only 14%.The American College of Obstetricians and Gynecologists has called for a reduction in the occurrence of non-medically indicated caesarean delivery and induction of labor prior to 39 weeks. Consistent increase has been observed in the rate of Caesarean section deliveries in most of the developed countries and in many developing countries, including India, over the last few

decades. An analysis of the National Family Health Survey data shows that the rate of this form of delivery in states like Kerala, Goa, Andhra Pradesh, West Bengal and Tamil Nadu is alarmingly high. States with marked demographic transition as well as high institutionalized births have an inflated rate of C-section deliveries. The present study aims at knowing the intra operative and post-operative difficulties encountered in repeat caesarean section patient when compared with primary caesarean section patient [2].

Aim of the Study

Comparative study of maternal morbidity in primary and repeat caesarean section patients.

Objectives

To study intra operative and postoperative maternal morbidity up to end of 1st week in primary and repeat caesarean section in singleton pregnancies. To compare these incidences of morbidity in primary and repeat caesarean section in intra operative and immediate postoperative period.

Materials And Methods: This is a hospital based Randomized prospective clinical study of 100primary and 100 repeat caesarean in department of obstetrics and gynecology at NIMS medical college & hospital, Shobha Nagar, Delhi highway during the period of December 2016 to December 2017 Inclusion Criteria: All full term singleton pregnant women are accepted for the study. Exclusion Criteria: Multiple pregnancies, Caesarean section done before 37 weeks gestation., Pre-eclampsia Diabetes, Pregnancy with other medical disorders.

Statistical Analysis

Descriptive statistics such mean, SD and percentage was used. Comparison between three groups was done by using ANOVA test followed by Dunnett Multiple comparisons test for continuous data A p-value less than 0.05 were considered as significant. Data analysis was done by software SPSS v16.0.

Ethical Clearance and Informed Consent

Before commencement of the study, informed consent was taken from the patients of the study sample. The purpose of the study was explained in local language or English and the subjects who were willing to participate, were included in the study and a written consent was obtained. Ethical clearance was obtained from ethical committee NIMS medical college, Jaipur.

Results and Observation

Present study was performed in randomly selected 200 cases of which 100 cases are primary and 100 cases of repeat caesarean section from NIMS medical college, hospital and research center, Jaipur, to analyze and categorize intra- operative and post-operative complications in relation to age, parity, no. of caesarean section and the management of these cases.

Table 1: Age distribution

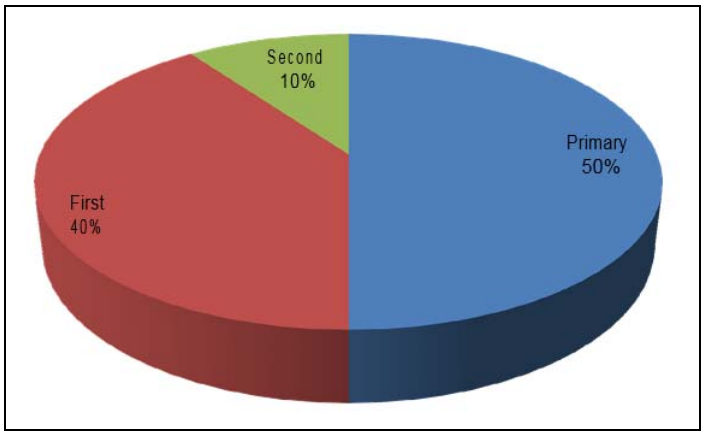
Age group	Frequency	Percent
18-22	60	30.0
23-27	98	49.0
28-32	35	17.5
32-37	7	3.5
Total	200	100.0

In our study the age group of cases which underwent C-section was between 18 to 37 yrs, with a mean age group of 27.5 yrs. The highest prevalence of previous C-section was seen in age group 23- 27 yrs, which accounted for (49%).

Table 2: Incidence of Parity

Parity	Frequency	Percent
Primi	59	29.5
Multi gravida	139	69.5
Grand multi gravida	2	1.0
Total	200	100.0

Out of 200 cases, 59 cases were Primi (29.5%), 139 cases were Multi-gravid (69.5%) and 1 case of Grand multi gravida (1%).



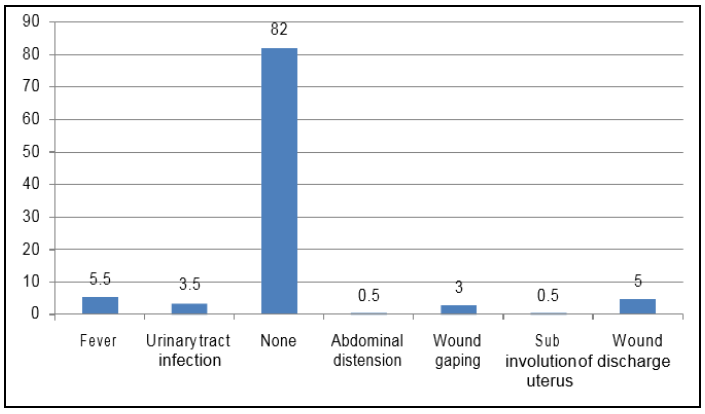
Graph 1: Number of caesarean section

Out of 200 cases, 100 cases are primary caesarean (50%) and out of the 100 repeat caesarean cases (50%), 80 cases are of first repeat caesarean section (40%) and 20 cases are second repeat caesarean cases (10%).

Table 3: Incidence of elective / Emergence caesarean

EL_EMG_CS	Frequency	Percent
Elective LSCS	15	7
Emergency LSCS	185	93
Total	200	100

Out of 200 cases, 15 cases were Elective caesareans (7%) and 185 cases were Emergency caesarean sections (93%).



Graph 2: Post-Operative Complication

Incidence of Post-operative complications i.e. out of 200 cases 164 cases did not have any post-operative complications (82%), 11 cases had Fever(5.5%), 7 cases had Urinary tract infection (3.5%), 1 case had Abdominal distension (0.5%), 6 cases had Wound gaping (3%), 1 case had Sub involution of uterus (0.5%) and 10 cases had Wound discharge (5%).

Table 4: Comparison of intra Operative complications between groups

Intra Operative Complications	No_of_Prev_CS			Total
	Primary (%)	First (%)	Second (%)	
Adhesion	0	42 (38)	31 (72)	73
None	92 (92)	43 (39)	2 (5)	137
Hemorrhage	3 (2)	6 (5)	2 (5)	11
Placenta previa	1 (1)	3 (3)	0	4
Extension of uterine incision	1 (1)	1 (1)	2 (5)	4
Injuries to new born	0	0	0	0
Thinned out lower segment	3 (3)	14 (13)	3 (7)	20
Scar dehiscence	0	2 (2)	3 (7)	5

Out of total 200 cases, 137 cases showed no intra operative complications, primary (92%), 1st repeat (39%) and 2nd repeat (5%). Incidence of Adhesions in primary- 0, 1st repeat-38%, 2nd repeat-72%; Hemorrhage in primary-2%, 1st repeat-5%, 2nd repeat-5%; Placenta previa in primary-1%, 1st repeat-3%, 2nd repeat-0%; Thinned out lower segment in primary-3%, 1st repeat-13%, 2nd repeat-7%; Scar dehiscence in primary-0%, 1st repeat-2%, 2nd repeat-7%.

Discussion

The caesarean delivery rate has increased for nearly two decades, resulting in steady decrease in the proportion of women achieving spontaneous vaginal delivery in the industrialized and developing countries throughout the world**.**

The relative safety of caesarean section deliveries and its perceived advantages relative to vaginal delivery has resulted in a change in the perceived risk benefit ratio, which has accelerated the acceptance for caesarean section. Although, the operation is now safer than in the past because of improvements in anesthesia, antibiotics and blood transfusion services, a caesarean section still carries a significant risk to the mother compared to a normal vaginal delivery [2].

Incidence of Complication in Repeat Caesarean Section

Caesarean section (CS) is the most common obstetric operative procedure worldwide with a continuously increasing incidence for the last couple of decades, giving the women, an obstetric status of "previous caesarean section". The raising CS rates add to potential complications especially during a repeat caesarean section in many countries, **i**n recent years the rate has risen to a record level of 46% in China and to levels of 25% and above in many Asian, European and Latin American countries. In 2007, in the United States, the Caesarean section rate was 31.8%.Across Europe, there are significant differences between countries: in Italy the Caesarean section rate is 40%, while in the Nordic countries it is only 14%.Consistent increase has been observed in the rate of Caesarean section deliveries in most of the developed countries and in many developing countries, including India, over the last few decades [3].

Our study incidence of C-section was around 33%, among them repeat C- section accounting for 42.5% in a 1 year study period. In a study conducted by Farkhundah Khursheed, Pushpa Sirichand and Nasreen Jatoiincidence of repeat caesarean section contributed to 36.5% of all caesareans performed. In some studies, the incidence of women with previous caesarean section was around 50% [2, 3].

Table 5: Rate of Caesarean Section

Author	Percentage
Anuradha Kumar *et al.*	15.8%
Kamala Jay Ram *et al.*	16%
Korst M.L. *et al.*	25%
Nielsen T.F. *et al*.	18%
Present study	33%

Our study sample size was limited to 200 cases, out of which 100 are primary and 100 cases of repeat caesarean sections done for various indications as follows;

A) An elective repeat section was performed in 15patients (7%) where in the indication being contracted pelvis, placenta previa, malpresentations, previous 2 or > caesareans.
B) Emergency repeat C-section was performed in the remaining patients (93%) for various indications, most common being fetal distress (26%) followed by. malpresentation (10%), meconium stained liquor (10%), cephalo-pelvic disproportion (10%) [1].

Table 6: Incidence of Elective and Emergency Caesarean sections

Author	Elective	Emergency
Anuradha Kumar *et al.*	15.8%	84.2%
Kamala Jay Ram	8.6%	91.4%
Singh B. *et al.*	27.3%	72.7%
Present Study	7%	93%

Relation between Complication and Number of Previous Caesarean Section

Multiple caesarean sections predisposes to an increased risk of severe dense adhesions, scar dehiscence, uterine rupture, abnormal placentation, significant hemorrhage, bladder injuries and caesarean hysterectomies. In a study conducted by Farkund, showed that incidence of complications were more in women with 2 previous caesarean sections, were in the most common complications was dense adhesions (35.5%), followed by thinned out lower uterine segment (16.6%), ruptured uterus (1.1%) and bladder injury (1.1%). But incidence of abnormal placentation was more with 3 or more caesarean sections (2%) as compared with previous 2 caesarean sections.

In our study, higher incidence of complications was found in women who underwent previous two caesarean sections, and adhesions was most frequently encountered, followed by hemorrhage and in the other group of women with previousone caesarean section, showed complications like adhesions, abnormal placentation and thinned out lower segment.

Intra-Operative Complications And Its On Table Managements

The relative safety of caesarean section deliveries and its perceived advantages relative to vaginal delivery has resulted in a change in the perceived risk benefit ratio, which has accelerated the acceptance for caesarean section.

Although, the operation is now safer than in the past because of improvements in anesthesia, antibiotics and blood transfusion services, a caesarean section still carries a significant risk to the mother compared to a normal vaginal delivery.

Complications of caesarean section can result from any number of factors that include maternal and fetal health, timing of the procedure, surgical technique, and clinician experience. Repeat caesarean section is associated with additional risks when compared with primary caesarean section.

Caesarean Delivery and Adhesions

In a study conducted by Lyell DJ, showed that the incidence of adhesions development after primary caesarean section ranges from 46-65%.In additional to the size and location density of adhesions can vary greatly. Some adhesions are easily separable and filmy in density while others were thick and dense articularly after multiple caesarean sections. In a retrospective study conducted by Morales *et al* [4, 5] in 542 women found that the incidence of adhesions was greater among women who underwent repeat caesarean delivery when compared with primary caesarean delivery and that percentage of women with adhesions increased with each subsequentcaesarean delivery. A large Canadian retrospective cohort study reported similar findings.

In the present study adhesions accounted for 36.5%, in primary it was 0%, 1st repeat 38% and 2nd repeat 72%. Among that the most common type of adhesion was observed between A7-36.4% (Bladder & uterus (dense)) and A1-24.2% (Parietal peritonium and anterior surface of uterus), Which was managed by adhesiolysis and in some cases incision was taken higher up. Majority of these cases were associated with excessive bleeding due to increased operating time and increase in raw surface area following adhesiolysis

Table 7: Incidence of Adhesions

Author	1st repeat CS	2nd repeat CS
Farkhundah Khursheed *et al.*	35.5%	68.2%
Morales *et al.*	46%	76%
Lyell D.J. *et al.*	46%	65%
Tulandi *et al.*	24%	45%
Nisenblat *et al.*	25.6%	46.1%
Myers S.A. *et al.*	5.5%	42.5%
Present study	38%	72%

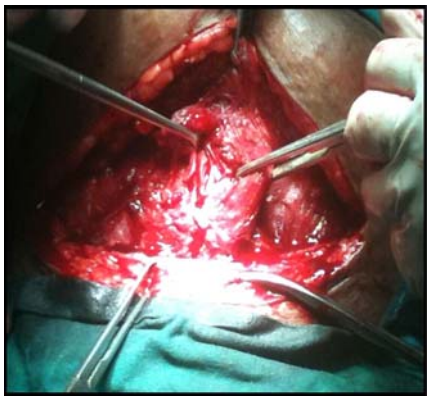


Fig 1: Abdominal wall adhesions in previous 2 C-sections.

Fig 2: Difficulty in opening the abdomen.

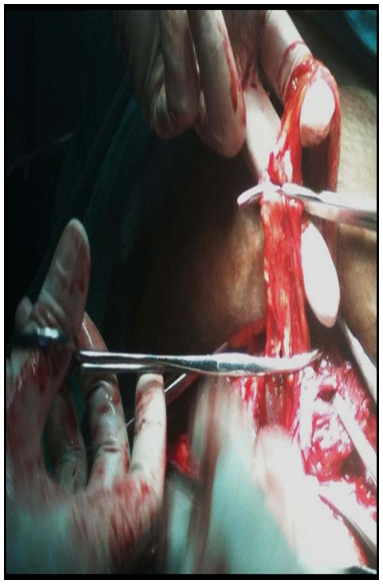


Fig 3: Omental adhesions with anterior surface of the uterine wall.

Thinned Out Lower Uterine Segment

In a study conducted in 240, repeat caesarean section by Khursheed F, Sirichand P, Jatoi N observed that there was a high incidence of extremely thinned out lower uterine segment (16.6%) in women with previous two sections as compared to women with previous one caesarean section (8.7%) and 8. 3% in previous 3 caesarean section [6, 7].

In our study 10% of the study group had thinned lower uterine segment. In primary it was 3%, 1st repeat 13% and 2nd repeat 7%.

Fig 4: Thinned out lower uterine segment

Scar Dehiscences

In a study conducted in 240, repeat caesarean section by Khursheed F, Sirichand P, Jatoi N observed that scar dehiscence was seen 7.8% of women with previous one caesarean section, 4.4% with previous two caesarean section and 5.5% in previous 3 caesarean section[3.] It was found in other studies that incidence of scar dehiscence and rupture of previous uterine scar was increased with the increasednumber of caesarean section, similarly in this study also increased frequency of scar dehiscence was observed frequently. The incidence of scar dehiscence was seen 2.5% of the cases, which were asymptomatic and an incidental on table finding. In primary it was 0%, 1st repeat 2% and 2nd repeat 7% [7, 8].

Table 9: Incidence of Scar Dehiscence

Author	Percentage
Farkhundah Khursheed *et al.*	7.8%
Present study	2.5%

Uterine Rupture

A Norwegian study found that women with previous caesarean section had a risk of uterine rupture which was 8 times higher after a trial of labor than at a repeat elective caesarean section, they also showed that induction of labor using prostaglandins was associated with highest risk of uterine rupture. There were no cases of uterine rupture, bowel injury, caesarean hysterectomy in present the study population because most of these cases were booked and a high level of intra-partum monitoring was done.

Post-Operative Complications and Its Management

Wound Infections

The incidence of abdominal incisional infections following caesarean delivery, according to Williams Obstetrics ranged from 3% to 15% with an average of 6% during caesarean section delivery. The post-operative complication rate was24.3%. 18.5% of the patients had febrile morbidity and 10.9% had non-febrile morbidity.

A retrospective cohort study was conducted by E. Henderson *et al*, the overall infection rates were 42.1% and 46.1% for women delivered by primary and secondary CS respectively, incision surgical wound infection accounted for the largest proportion of post-caesarean infection[4]. All types of post-caesarean infection, except asymptomatic bacturia, caused the duration of the postpartum hospital stay to be significantly long.

In our present study, the incidence of post-operative wound discharge in primary was 3%, first repeat caesarean was 5% and second repeat caesarean was 15%. The incidence of wound gaping in primary was 2%, 1st repeat 3% and second repeat 10% [8, 9].

Table 9: Incidence of Wound Infection

Author	Primary CS	1st repeat CS
Ghant *et al*.	3%	15%
E.Henderson *et al*.	42%	46.1%
T. Parrot *et al*.	4.6%	11.3%
Present study	2%	3%

Endomyometritis

Endomyometritis complicates up to 80% of caesarean section. In the absence of prophylactic antibiotics, the rates of postpartum endomyometritis can be as high as 35% to 40%. Extended labor and as low as 4% to 5% for those undergoing a scheduled This rate varies dramatically according to the clinical situation.

with rates as high as 85% for women undergoing caesarean section after an caesarean delivery with intact membranes.The use of routine prophylactic antibiotics substantially reduces the rate of infection.

In our present study the incidence of fever in primary 4%, 1st repeat 4% and 2nd repeat 20%. The percentage of infection is more because of undernourishment and anemia of the patients which is more in this area.

Urinary tract infection

T. Parrot *et al.* conducted a prospective study, 31. 5% patients developed infections. There was no significant difference in infection rate between elective and emergency procedure. 4% developed endometritis; wound infection was found 11.3% and 14.5% developed a post-operative UTI [8, 9].

In our present study the incidence of UTI in primary was 2%, 1st repeat was 4% and second repeat was 10%. Routinely catheters are removed after 24hrs of surgery and urine sample is sent for culture and sensitivity.

Conclusion

Caesarean section is one of the most commonly performed operations worldwide. While the world has been facing an epidemic of rising Caesarean section rates over the past few decades.

During a caesarean delivery women are at an increased risk of injury than they are during a vaginal birth. The risk increases with the increasing number of caesarean sections, parity, early marriages, early conception, short intervals between subsequent pregnancy, undernourishment, anemia, inadequate ante-natal checkups, high prevalence of illiteracy and poverty especially in our Indian women. Maternal morbidity is definitely high as the number of caesarean sections increase. The increase trend towards caesarean section should be brought down by educating the patients about need for good antenatal care, correction of anemia, need of last few visits to a tertiary level center in order to decide the mode of delivery and to undergo elective or emergency caesarean section in a center better equipped and also to maintain and preserve all the records and details of the previous caesarean delivery, as it could play a very vital role in deciding and handling the women in the subsequent pregnancies and intra operative complications. Proper counseling of the women should be done for spacing of pregnancies in previous caesarean cases as it would give adequate time for uterine scar to heal and there would be better chance for a successful VBAC later. VBAC should be encouraged by the clinicians by carefully selecting the patients for trail of vaginal birth and careful intra-partum monitoring should be done as rupture of scar may endanger the life of mother and child.

But whatever said and done, caesarean section still carries a significant risk to the mother compared to a normal vaginal delivery. Therefore, as obstetricians, it is our endeavor to have a healthy mother and baby at the end of pregnancy. If caesarean section is the better mode to achieve this, we may opt for it while keeping in mind the inherent risks and difficulties of it as a surgical procedure…and thus it is very essential to keep our caesarean section rate to a reasonable limit.

The best technique to reduce the multiple potential risks of repeat caesarean section is to reduce the rates of primary and repeat caesarean sections whenever possible.

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