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VAGINAL DELIVERY VERSUS CAESAREAN SECTION: SHORT-TERM MORBIDITIES

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ABSTRACT

Objective: To compare short-term complications after vaginal delivery Caesarean section. **Methods:** The total sample size was 4205 patients of which 2653(63.1%) women were delivered via vaginal delivery including instrumental deliveries and 1552(36.9%) women were delivered via Caesarian section. Data were collected retrospectively from patient records with Medical Record Section. Follow-up records of the day of delivery, post-delivery day1, 3, and on the day of discharge recorded. Data were compared and analyzed according to the intended mode of delivery. **Results:** There were no sociodemographic differences between the groups. Significant higher incidences in mean estimated blood loss, blood transfusion, rate of infection, ICU admission, near-miss mortality, and mortality were found. Complications in the Caesarean section group were lower than previously reported. The Caesarean section group had a longer hospital stay than women who delivered vaginally. The NICU admission and neonatal complications were also high among cesarean babies. **Conclusion:** Caesarean sections can cause both short-term and long-term complications. The risk of morbidity and mortality was high in women undergoing cesarean section. CS does not improve maternal, neonatal, and perinatal mortality and morbidity. Therefore, Cesarean section should only be undertaken when obstetrically and medically justified.

KEYWORDS : Cesarean delivery (CS), Vaginal Delivery (Vd), maternal complication, neonatal complications

INTRODUCTION

Caesarian section rates continue to rise globally, where in 1990 they were around 7% of total deliveries and currently account for 21% of total deliveries [1,2]. These numbers are to continue rising over this decade and will be about 29% by 2030. Cesarean sections are critical to saving lives, however, the rising trend of cesarean on demand is a worrisome trend. Many hospitals are on the verge of shutting down labor rooms and the art of obstetrics will soon be a forgotten one [3,4]. Obstetric forceps which were once kept secret from the world by the Chamberlen family for over a century will soon only be seen in Museums or exam viva tables [5]. A belief has become widespread that the risks of cesarean delivery for healthy women are so low as to make it a reasonable elective option for childbirth. To address the question of whether CS without medical indications is justified or not, it is imperative to know the associated mortality and morbidity of CS. The aim of this study was to assess the short-term complications of the Caesarian section in comparison to normal vaginal delivery in both mothers and newborns.

MATERIALS AND METHODS

The study was conducted to evaluate the short-term complications between modes of delivery at Smt Kashibai Navale General Hospital over a period of 2 years from January 2021 to December 2022. It was a retrospective study and the cases Inclusions done from the Labor ward birth registry and Medical Records Department of delivered cases at between 37 weeks to 40 weeks of gestation. The total sample size was 4205 patients of which 2653(63.1%) women delivered via vaginal delivery including instrumental deliveries and 1552(36.9%) women delivered via Caesarian section including on-demand or elective Caesarian sections. Data was collected retrospectively from patient records with effort being taken to ensure patient confidentiality. Socio-demographic background and ANC health was also recorded for all included patients in this study. Follow-up records of the day of delivery, post-delivery day1, 3, and on the day of discharge recorded. Details of the study design are provided in Table 1.

The variables & complications taken into consideration were, blood loss >1000ml, blood Transfusions needed both intra and post-operatively, duration of stay at the Hospital, Number of patients requiring wound re-suture, Hospital Acquired Infections (including surgical site infections, urinary tract infections, and phlebitis), days of Foleys catheterization, and maternal ICU near miss & actual mortality. Neonates Apgar scores at birth and NICU admission were also recorded. The diagnosis of endometritis was verified by the criteria being used: positive culture and/ or elevated serum C-reactive protein, in addition to the presence of symptoms.

Table 1. The Study Designs

<table>
<tr><td colspan="3">Inclusions of Cases from the Medical Records Department Files & Birth registry records of delivered cases between 37 to 40 weeks of gestation.</td></tr>
<tr><td>Phase: Data collected (Medical Records)</td><td colspan="2">Total Number of deliveries (n= 4205)</td></tr>
<tr><td>Follow-up records on the Day of delivery & day 1</td><td rowspan="3">Cesarean Delivery for all Obstetrics Indications (n=1552) (36.1%)</td><td rowspan="3">Vaginal Delivery (n=2653) (63.9%)</td></tr>
<tr><td>Follow-up records on Day 3 of Delivery</td></tr>
<tr><td>Follow-up records on the Day of Discharge from the Hospital</td></tr>
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Table 2. Maternal Characteristics And Sociodemographic Factors

Sociodemographic factors and Maternal characteristics	Total Number of deliveries (n= 4205)		P- value
	Cesarean Delivery (n=1552)	Vaginal Delivery (n=2653)	
Mean weight in kg	58.2	54.5	<0.0001
Age Group (Years)			
20-24	569	995	<0.0001
25-29	479	1017	<0.0001
30-34	336	398	<0.0001
>35	52	88	
Mean age in years (range)	24.40 (18 to 37)	25.60 (18 to 33)	< 0.001
Gravida Status			
Primigravida	608	796	<0.0001
Second gravida	491	862	<0.0001
Third Gravida	287	685	<0.0001

Grand multipara	156	310	<0.0001
Antenatal Booking status	1121	2159	<0.0001
Antenatally previous Hospital admission in the present pregnancy	188	210	<0.0001

Table 3. Delivery Data

Delivery outcomes	Total Number of deliveries (n= 4205)		P-value
	Cesarean Delivery (n=1552)	Vaginal Delivery (n=2653)	
Mean gestational week at delivery	38	40	<0.0001
The mean duration of Hospital Stay (days)	5.4	3.2	<0.0001
Wound re-sutures (Episiotomy & Caesarean wounds)	14(0.9%)	41(1.5%)	<0.0001
Number of Hospital Acquired Infections	40(2.5%)	9(0.33%)	<0.0001
Foley cathe-terization beyond 48 hrs	192(12.24%)	30 (1.13%)	<0.0001
Blood loss >1000ml	580(37.37%)	525(19.78%)	<0.0001
Blood Transfusion	176(11.34%)	38(1.43%)	<0.0001
Newborn NICU Admission	179(11.53%)	161(6.06%)	<0.0001

Table 4 – Complications

Complications	Total Number of deliveries (n= 4205)		P- value
	Cesarean Delivery (n=1552)	Vaginal Delivery (n=2653)	
ICU Admissions	61(3.93%)	11(0.41%)	<0.0001
Pneumonias	6(0.38%)	1(0.03%)	<0.0001
Intestinal obstruction	1(0.06%)	0(0%)	<0.0001
Prolonged vaginal bleeding> 3 days	1(0.06%)	3(0.11%)	<0.0001
Anal sphincter injury, 3rd and 4th degree	0(0%)	7 (0.26%)	<0.0001
Instrumental delivery	0(0%)	49 (1.84%)	<0.0001
Anaesthetic complications	3(0.19%)	0(0%)	<0.0001
Urinary infection	7 (0.45%)	15 (0.56%)	<0.0001
Endometritis	8 (0.51%)	2 (0.07%)	<0.0001
Amniotic fluid embolism	1(0.06%)	0(0%)	<0.0001
Post delivery Ileus	6(0.38%)	1(0.03%)	<0.0001
Post-partum urinary retention	0(0%)	2(0.07%)	<0.0001
One or more major complications	53 (3.41%)	13 (0.49%)	<0.0001
Near Miss Mortality (WHO criteria) ‡	43(2.70%)	09(0.33%)	<0.0001
Maternal Death	6(0.62%)	2(0.07%)	<0.0001

‡ Details of Near Miss mortality elaborated in Table 5

Table 5- Near Miss Mortality: Potentially Life-threatening Conditions Were Diagnosed, And Those Cases Which Met Who 2009 Criteria For Near Miss Were Selected

Maternal Complication with near Miss Mortality	Number of Cases (Total= 52 Cases	Percentage
Obstetric Haemorrhage	22	44%
Preeclampsia	15	30%
Cardiac Dysfunction	2	4%
Surgical	1	2%
Sepsis	3	6%
Endocrine Dysfunction	2	4%
Covid 19	4	8%
Neurological dysfunction	3	6%

DISCUSSION

The aim of this study was to compare medical complications in healthy women after vaginal delivery and Caesarean section. When we analysed the data by intended mode of delivery, we found significant differences between the groups in the rate of complications. The mean age in years (range) was 24.40 years for cesarean delivery (CS) and 25.60 years for Vaginal delivery (Vd). All other Socio-demographic data were comparable in both groups.

Hemorrhage

It is the most common cause of maternal morbidity. Incidence after CS was 37.37% whereas it was19.78% in vaginal deliveries. The number of patients who had Blood Transfusion was 11.34% among cesarean deliveries and only 1.43% in vaginal deliveries. Severe hemorrhage is defined as: >1500 mL blood loss, transfusion of ≥ 4 units red cells, fall in the hemoglobin ≥ 40 gm/L. A 6-14 folds increase in most severe forms of hemorrhage leading to hysterectomy or other interventions, even for primary CS compared to Vd, and more after a prior CS is seen by Stivanello E et.al [6]. Risk factors are prior CS which predisposes to abnormal placentation and uterine rupture [7]. A prior CS is associated with a higher risk for hemorrhage in CS delivery and also in subsequent Vd compared to women with a history of Vds only [8]. Significant risk factors for PPH after adjusting for confounders are age ≥35 years, multiple pregnancies, fibroids, preeclampsia, amnionitis, placenta previa or abruption, cervical laceration, uterine rupture, and CS [9].

Infections

In our study, endometritis infection was five times higher after CS 0.51%than after Vd (0.07%. Febrile morbidity was reported in approximately 30% of women undergoing CS. Prophylactic antibiotics reduced the incidence of febrile morbidity from 50% to 15% [10]. Serious infectious morbidity (defined as bacteremia, septic shock, septic thrombophlebitis, necrotizing fasciitis or death attributed to infection) was reported following 1–2% of cesarean births [10].

In our study wound infection-Surgical Site Infections (SSI) leading to secondary suturing after CS was 0.9% during a follow-up, and it was 1.5% in Vd for episiotomy. The risk factors for SSI are emergency CS, premature rupture of membranes, anemia, obesity, and operating time > 38 minutes [11]. Urinary Tract Infections -UTI occurred in 0.56% after Vd, 0.45% after CS in our study, it was comparable. It was 3.0% after emergency CS in a study on infections related to CS [10]. Pneumonia was more common in women delivering by CS than Vd. The incidence was 0.03% after Vd, 0.38% after elective CS. Sepsis can be a common cause of maternal deaths, especially in low-resource settings. This can progress to septic shock with signs of hypotension, low platelet count, hypoperfusion. Postpartum sepsis is 3.2 times more common after CS deliveries compared to Vd [12]. UTI and chorioamnionitis are common infections associated with septic shock.

Risk factors for maternal sepsis are obesity, diabetes or IGT, impaired immunity, immunosuppressive medications, anemia, prolonged rupture of membranes, amniocentesis, history of pelvic infection, group B streptococcal infection in women, or close contacts.

Anesthetic Complications

We recorded anesthetic complications among 0.19% after CS and 0% in Vd. Neuraxial anesthesia for CS is safe and preferred to general anesthesia because it minimizes the risk of failed intubation, ventilation, and aspiration. A significant number of the women who died while undergoing CS may have required emergent delivery, requiring general anesthesia rather than regional anesthesia, and these factors contributed to the higher rate of mortality and morbidity associated with CS. One or more major complications were 3.41% after CS and only 0.49% after Vd.

ICU Admission, Near Miss Mortality, and Mortality

In our study the Incidence of ICU admission after CS was 3.93% whereas it was 0.41% % in vaginal deliveries. The Near Miss Mortality as per WHO criteria was 2.70% after CS and only 0.33% in Vd cases, Maternal Death after CS was 0.62%, whereas it was 0.07% in Vds.

Severe Acute Maternal Morbidities (SAMM): Life-threatening complications, in terms of organ failure and life-saving surgery constitute SAMM. Women with SAMM are unlikely to survive if they do not receive care in a hospital [13]. The incidence of severe maternal morbidity depends on the criteria used: organ system-based or intervention criteria. It is 3-4 times more often related to CS than to Vd. The incidence of severe maternal morbidity was 4.77% compared to 1.41% for vaginal deliveries [14]. NEAR MISS: A woman who nearly died but survived a complication that occurred during pregnancy, childbirth, or within 42 days of termination of pregnancy is near miss case. These women survive a life-threatening condition [15]. The most common causes of near-miss mortality in our study have been Obstetric Hemorrhage (44%), Preeclampsia (30%), cardiac dysfunction (4%), Surgical (2%), Sepsis (6%), Endocrine Dysfunction (4%), Covid (8%) and Neurological dysfunction (6%). The cesarean group also had a significantly higher post-partum risk of cardiac arrest hysterectomy, hemorrhage requiring hysterectomy, wound hematoma, major puerperal infection, anesthetic complication, venous thromboembolism compared to planned vaginal delivery group [16].

Complications/Morbidity Related to Vaginal Delivery

Perineal lacerations are more common in Vd. Anal sphincter injury occurred in 0.26% in Vd, 1.84% Vd were instrumental deliveries. Reported rate of flatus incontinence was 8-61% and of fecal incontinence 0-20% [17]. Problem of anal incontinence occurs less frequently after CS births [18]. Vd is also a risk factor for Pelvic Organ Prolapse (POP) and urinary incontinence [19].

Neonatal Morbidity in CS Versus Vd

In our study, Newborn NICU Admission was 11.53% in CS group and it was 6.06% in Vds. MacDorman MF et al., have examined neonatal mortality risk with no medical or obstetric risk factors in "CS without labor complications" and "planned vaginal delivery". After adjusting for several confounding factors the OR for neonatal mortality was 1.7 in CS babies compared to babies born after planned Vd[20].

We have not studied the long-term complications of cesarean delivery including morbidly adherent placenta, chronic pelvic pain, adhesions, ectopic pregnancy, and future infertility. A strong argument against liberal policies of delivery by CS is the prospect of adverse medical outcomes in subsequent pregnancies. The consequences for the ensuing deliveries must be considered in decisions about elective CS. Several factors must be considered when counseling pregnant women on how they should give birth. It is very difficult to predict the reproductive future of an individual woman. The woman's age, any history of infertility, and time to conception may guide decisions. It is arguably not a good option to deliver a first pregnancy by elective CS if more than two children are planned, since several studies have shown higher rates of complications after two or more Caesarean sections [21].

CONCLUSION

Cesarean sections can cause both short-term and long-term complications. The risk of morbidity and mortality was high in women undergoing cesarean section. CS does not improve maternal, Neonatal, and perinatal mortality and morbidity. Therefore, Cesarean section should only be undertaken when obstetrically and medically justified.

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