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Retrospective Review of Caesarean Delivery in a Tertiary Hospital in Jigawa, North-west Nigeria

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Abstract

Background: Caesarean section is the most common obstetric surgical procedure. Although the advancement in asepsis and anaesthesia has made the procedure safer, still adverse events do occur in the setting of Caesarean section.
Objective: This study aimed to determine the rate and outcome of Caesarean sections.
Materials and methods: The study was a 3-year retrospective review of Caesarean sections carried out between 1st July 2020 and 31st June 2023 in the department of Obstetrics and Gynecology of Rasheed Shekoni Federal University Teaching hospital Dutse. The case files of the participants were retrieved from the record department. Data analysis was carried out using IBM statistical package for social sciences (SPSS) version 26. Measured variables were expressed in frequencies and percentages. Test for association was done using chi-square non-parametric test, setting level of significance at $P<0.05$.
Results: A total of 376 Caesarean sections were performed out of a total 2,483 deliveries, giving a Caesarean section rate of 15.3%. The mean age of the women was 28.51± 5 years. The mean parity was 4.46± 2.7. Majority (94.76%) of the women had EBL of ≤ 1000mls and the mean unit of blood transfused was 0.65± 0.9 units. Most (87.7%) of the babies delivered had 5th Apgar score of ≥ 7.
Conclusion: The Caesarean section rate in this study is close to the rate recommended by WHO, however the repeat Caesarean section rate is high

Keywords: Caesarean Section, Delivery, Jigawa, Postpartum, Pregnancy

Introduction

Caesarean section (CS) is a major abdominal surgery performed on women globally and its rate has steadily increased over the last decade.[1,2] CS is defined a delivery of the fetus, placenta and membranes through an abdominal and uterine incision after the age of viability.[3] In 1985 in Brazil, the world health organization (WHO) recommended CS rate of 10-15% as the optimal range for targeted provision of life saving intervention for mother and infant; declaring that lower rate suggest unmet need of the patient, while higher rate indicate improper selection with no additional benefit to both mother and infant.[4,5] However, this recommendation has been contested. This is because the data used for the recommendation

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was primarily obtained from European countries.

The CS rate varies from one country to the other. The rate is higher in middle and high income countries.[6] The CS rates in China, Australia and Brazil are 25.9%, 32.3% and 45.9% respectively.[6,7,8] However, the population based CS rate in low income countries is low. The rate in West Africa is 3.0%;[6,8] and this may reflect poor access to comprehensive obstetric care services in the region.[7]

The population-based CS rate in Nigeria is 2.0% and it is far below the 10% recommended by WHO.[9] Nigeria currently account for the highest absolute number of maternal mortality and the highest number of neonatal mortality in the world.[10,11] Foremost strategy in reduction of maternal morbidity & mortality includes prompt utilization of CS and promoting skilled birth attendance or institutional delivery.[12] However, women in Nigeria opt to deliver outside health institutions where deliveries are supervised by unskilled attendants because of the following reasons: high cost of treatment, transportation difficulties, and aversion to CS because of fear of the procedure, cultural and religious belief, stigma of being mocked by other women, and concern about future fertility.[13,14,15]

Caesarean sections are either performed as emergency or elective. Elective CS is scheduled operation with better outcome when compared to emergency that is associated with higher morbidity and mortality.[16] The indications for CS could be absolute or relative. These indications include previous CS, cephalo-pelvic disproportion (CPD), obstructed labour, hypertensive disorders of pregnancy, antepartum haemorrhage (APH), fetal distress and failed induction of labour.[17,18,19] Other indications are multiple pregnancy, malpresentation, malposition, abnormal lie, fetal macrosomia and maternal request.[16,17,20]

The advancement of science in asepsis, anaesthesia and availability of blood transfusion services has made CS safer.[2,21,22] Still adverse events do occur in the setting of CS and may include injury to the bladder, ureters or surrounding bowel and increased intra-operative blood loss.[23] Other complications associated with CS are postpartum haemorrhage (PPH), increased risk of thromboembolism, wound infection and endometritis[24,25]

Most of the studies done on CS in Nigeria are institution-based and are limited by sample size. In view of this, we aimed to determine the rate, indications, outcomes and complications of Caesarean section at Rasheed Shekoni Federal University Teaching Hospital Dutse, over a 3 years period.

Material and method

Study area

The study was a carried out in the department of Obstetrics and Gynecology of Rasheed Shekoni Federal University Teaching Hospital (RSFUTH) Dutse between 1st July 2020 and 31st June 2023. RSFUTH is one of the tertiary health facilities in Jigawa state. This Hospital serves as a referral center for patients within Jigawa and neighboring states.

Study design

This is a retrospective cross-sectional study.

Study population

The study participants were all the patients who had CS at RSFUTH during the review period. The case files of the participants were retrieved from the record department. All the patients who did not have CS in the study facility and those with gross missing data were excluded.

Data collection

Patients' data were obtained using a structured proforma from their case files. Relevant information obtained from the files included socio-demographic data, indication for the CS, category of CS, type of anaesthesia, maternal outcome, foetal outcome and duration of stay in the hospital after CS.

Data processing and statistical analysis

The data obtained was checked for completeness and accuracy. Data analysis was carried out using IBM statistical package for social sciences (SPSS) version 21.0. Measured variables were expressed in descriptive statistics; mean ± SD for normally distributed quantitative variables, median and interquartile range for skewed quantitative variables. Qualitative variables were expressed in percentage and proportions. Test for association was done using Chi-square non-parametric test setting P- value at < 0.05 at 95% level of confidence.

Ethical consideration

The study was carried out after obtaining approval from the Health Research and Ethics committee of Rasheed Shekoni Federal University Teaching Hospital Jigawa (RSFUTH/GEN/256/V.II) on May

6, 2024. In line with the Helsinki Declaration, informed consent was obtained from the study participants before data collection.

Results

A total of 376 Caesarean sections were performed out of a total 2,483 deliveries, giving a CS rate of 15.3%. However only 344 cases of CS were analyzed, out of which 200 (58.1%) were primary Caesarean sections and 144 (41.9%) were repeat Caesarean sections. This is illustrated in figure 1 and 2.

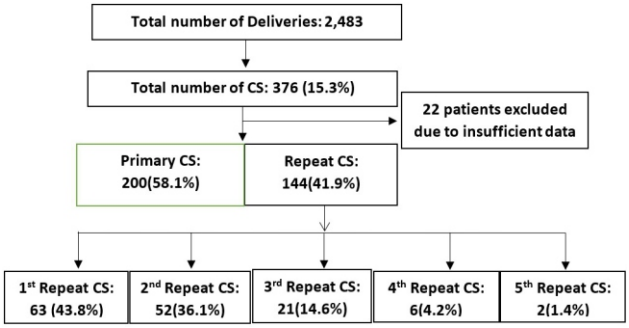

Figure 1: Stratification of study participants by the number of Caesarean sections

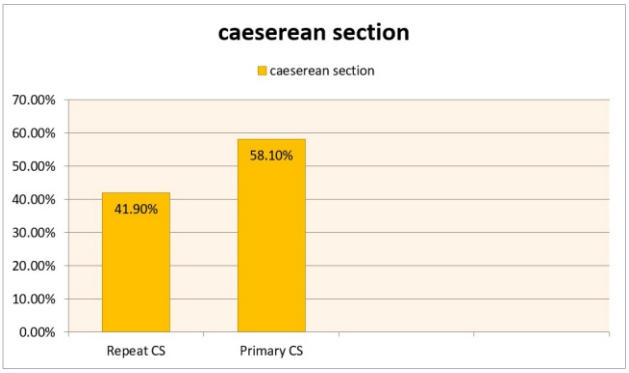

Figure 2: Types and rate of Caesarean section

As shown in Table 1, the mean age of the women was 28.51± 5.9 years and the age range was 16-45 years. The CS rate was highest (48.8%) among women aged 20-29 years.

The mean parity was 4.46± 2.7. Most (47.7%) of the women were multiparous. Majority (45.9%) of the women had secondary education as their highest educational attainment. More so, most of the women came from urban setting (72.4%) and booked for antenatal care in the study facility (48.7%).

Out of the 344 Caesarean sections, 97 (28.2%) were elective and 247 (71.8%) were emergency. Spinal anesthesia was the most common (73.8%) type of anesthesia used. This is shown in Table 2 below.

The commonest indications for primary CS are hypertensive disorders of pregnancy (19.5%), cephalo-pelvic disproportion (12.0%) and bad obstetric history (8.5%). Failed induction of labour (IOL), fetal distress and fetal macrosomia each accounted for 7.0%. Other indications are malpresentation (6.0%), obstructed labour (5.5%), twin gestation (5.5%), placenta praevia (5.0%), poor progress (4.0%) and others (13.0%). This is illustrated in Figure 3.

Table 1: Socio-demographic characteristics of the participants

Variables	Frequency (n)	Percentage (%)
Age:	mean- 28.51± 5.9, range- 16-45	
≤19	18	5.2
20-29	168	48.8
30-39	148	43.0
≥40	10	2.9
Parity:	mean- 4.46±2.7, range- 1-12	
1	84	24.4
2-4	164	47.7
≥5	96	27.9
Education		
No formal	77	22.4
Primary	66	19.2
Secondary	158	45.9
Tertiary	43	12,5
Residence		
Urban	249	72.4
Rural	95	27.6
Booking status		
Booked at study hospital	167	48.7
Booked elsewhere	110	31.8
Un-booked	67	19.5

Table 2: Surgical characteristics of the Participants

Variable	Frequency (n)	Percentage (%)
Category of CS		
Elective	97	28.2
Emergency	247	71.8
Type of anaesthesia		
Spinal	254	73.8
General	90	26.2

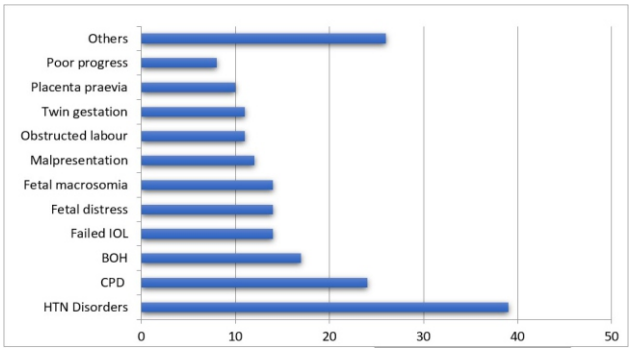

Figure 3: Indications for Primary Caesarean section

Table 4 shows the indications for repeat CS. Among the patients with 1st repeat CS; fetal macrosomia was the commonest (40.91%) indication among those who had elective CS and failed vaginal birth after Caesarean section (VBAC) was the commonest (58.5%) indication among those with emergency CS. Among the patients with 2nd repeat CS; 28 (53.85%) patients had elective CS and 22 (42.3%) patients presented in labour and subsequently had emergency CS. Almost all the 3rd, 4th and 5th repeat CS were elective.

Table 4: Indications for Repeat Caesarean section

Indication for repeat CS	Frequency (n)	Percentage (%)
I- 1st repeat CS	**n= 63 (43.8%)**	
Elective	n=22	34.92%
Macrosomia	9	40.91
Malpresentation	3	13.63
Bad Obstetric History	3	13.63
Maternal request	3	13.63
Twin gestation	2	9.10
Previous 4th degree perineal tear	2	9.10
Emergency	**n=41 (65.08%)**	
Failed VBAC	24	58.50
Severe Preeclampsia	7	17.10
Antepartum hemorrhage	3	7.30
Postdate	2	4.90
Fetal distress	3	7.30
Premature rupture of membrane	2	4.90
II- 2nd repeat CS	**n=52 (36.1%)**	
Elective	28	53.85
Presentation in labour	22	42.31
Severe Preeclampsia	2	3.84
III- 3rd repeat CS	**n=21 (14.6%)**	
Elective	17	80.96
Presentation in labour	2	9.52
Severe Preeclampsia	1	4.76
Placenta praevia	1	4.76
IV- 4th repeat CS	**n=6 (4.2%)**	
Elective	5	83.3
Presentation in labour(emergency)	1	16.7
V- 5th repeat CS	**n=2 (1.4%)**	
Elective	2	1.4

Majority (82.8%) of the intra-operative findings were that of clean abdominal-pelvic cavity. However, 56 (16.3%) patients had adhesion. Majority (94. 76%) of the women had estimated blood loss (EBL) of ≤ 1000mls. The mean estimated blood loss (EBL) was 555.50± 1.83ml. The mean unit of blood transfused was 0.65± 0.9 units. Regarding the fetal outcome, majority (87.7%) of the babies delivered had 5th Apgar score of ≥ 7. There were 34 (9.9%) special care baby unit (SCBU) admissions and 22(6.4%) fetal death. Most (40.7%) of the CS had senior registrar as the lead surgeon. Furthermore, the mean postoperative admission was 4.99± 0.52 days and majority of the participants were admitted for 4-7 days. Majority (80.8%) of the participants had no post – operative complication. This is shown in Table 5.

Table 5: Peri-operative events, findings and complications

Peri-operative events and complications	Frequency (n)	Percentage (%)
Intra-operative findings		
Clean abdomino-pelvic cavity	285	82.8
Adhesions	56	16.3
Extension of uterine incision	12	3.5
Placenta praevia	12	3.5
Bladder injury	3	0.9
Uterine rupture	3	0.9
Scar dehiscence	2	0.6
Bowel injury	1	0.3
EBL (ml), mean= 555.50±1.83ml, range= 150-2200mls		
≤ 1000	326	94.8
>1000	18	5.2
Blood transfusion (unit), mean= 0.65±0.9unit, range=0-5		
Neonatal outcome		
5th Minute Apgar score		
< 7	39	11.3
≥ 7	305	88.7
SCBU Admission	34	9.9
Perinatal death	22	6.4
Cadre of Surgeon		
Consultant	86	24.8
Senior registrar	140	40.7
Medical officer	118	34.3
Post-operative admission, mean=4.99±0.52 days, range= 3-17 days		
≤ 3	76	22.1
4-7	244	70.9
>7	24	7.0
Maternal post-operative complication		
Nil	278	80.8
Anaemia	36	10.5
Surgical site infection	30	8.7

There was statistically significant association between category of Caesarean section and type of anaesthesia (X2 = 28.829 df= 1, P= 0.001); and also significant association between type of Caesarean section and type of anaesthesia (X2 = 92.547 df= 2 P= 0.000). This illustrated in Table 6 below.

Table 6: Association between Caesarean section and Anaesthesia

	Anaethesia		
Variables	General	Spinal	Total
Category of CS,	$X^2 = 28.829$,	df= 1,	P= 0.001
Elective CS	6	91	97(28.2%)
Emergency CS	84	163	247(71.8%)
	90(26.2%)	254(73.8)	344(100%)
Type of CS,	$X^2 = 92.547$,	df= 2,	P= 0.000
Primary CS	70	130	200(58.1%)
Repeat CS	20	124	144(41.9%)
	90(26.2%)	254(73.8%)	344

Discussion

The overall Caesarean section rate in this study was 15.3%. This falls almost within the 10 - 15% recommended by the WHO.4 The CS rate in the current study is similar to the 15.5% reported in Kano, North-west Nigeria.[26] The similarity could be because

these studies were done in tertiary health facilities of the same region, where the participants share similar socio-cultural characteristics and religious belief. The CS rate is higher than 10.6% and 11.8% reported in Sokoto, North-west and Maiduguri, North-east Nigeria respectively.[19,26]

However, the CS rate in the current study is lower than 21.4% reported in Abuja, North-central, 27.6% in Enugu South-east, 35.9% in Osogbo, South-west and 42.4% in Yenogoa, South-south Nigeria.[28-31] The disparity could be attributed to the difference in population coverage by the health facilities, availability of alternative private health facilities providing similar services, socio-economic class of the patients, booking status of the patients, use of instrumental vaginal deliveries and conduct of vaginal birth after CS (VBAC).

Adewuyi et al reported a population based national CS prevalence rate of 2% in Nigeria.[9] The low prevalence was attributed to the following factors: Limited access or non-availability of obstetric care services, low acceptance of CS among women because of fear of complications and death, and high cost of surgery.[32] However, this study is institution based with a larger proportion of referred high risk patients. As such does not provide a true reflection of the rate in the population.

The mean age of the women in this study was 28.51±5.9. Majority (48.8%) of the women were between the ages of 20-29 years. This is in agreement with the findings the studies by Ladan et al and Geidam et al.[19,27] Most of the women were multiparous. This is also in keeping with the findings of Ladan et al and Allagoa et al.[27,31]

Majority of the women had secondary education as their highest level of education. Education has been shown to be a strong predictor of using professionally-assisted delivery services.[35,36] Educated women play a larger part in reproductive decision-making and have more access to healthcare, thereby increasing their chances of having caesarean section.[33-37]

Additionally, most of the women in the current study came from urban setting. Pregnant women in rural areas refrain from using health facilities due to poverty, transportation difficulties, illiteracy and gender inequalities in decision-making.[38-41]

Most of the women in the current study booked for antenatal care. Similar findings was reported in Sokoto and Maiduguri.[19,27] The high antenatal care booking rate in the current study could be expected as most of the women had secondary and tertiary education and are more likely to be employed; and most of them reside in urban setting with better access to health facilities.

Regarding category of caesarean section, majority (71.8%) of the CS was done as emergency. Similar findings were reported in Sokoto (65.1%), Kano (66.1%), Enugu (72.8%) and Bayelsa (80%).[26,27,29,31]

Spinal anaesthesia was used for the majority of the women in this study. There is global trend towards increasing use of spinal anaesthesia because of its advantages over general anesthesia, which include better neonatal outcome, less blood loss and less risk of aspiration.[42]

In the current study, primary CS account for 58.1% of overall CS. The commonest indication of primary CS in this study was hypertensive disorder of pregnancy. This is in agreement with the findings of Ladan et al and Attah et al.[26,27] Other common causes of primary CS in this study were cephalo-pelvic disproportion and bad obstetric history.

A significant number (42.3%) of the women with 2 previous CS presented to the delivery room in labour and subsequently had emergency caesarean section. There is conflicting evidence regarding increased risk of uterine rupture with trial of labour in patients with two or more previous CS. Some studies have shown similar VBAC success rate of 62-75% with single prior CS and 2 previous CS. For this reason women with 2 previous lower transverse CS remain candidates for trial of labour.[45,47] However, parturients with 2 previous CS are not encouraged to have vaginal delivery in the study facility. They are usually delivered by emergency CS when they present in labour. Exceptions are those women who present in second stage of labour and do not have contraindication to vaginal delivery. Inadequate staffing, lack of equipment for electronic monitoring of labour and medico-legal concerns are part of the reasons why CS is usually opted for.

In the current study repeat CS rate in context of overall CS is 41.9%. This is higher than 25.7% reported in Sokoto and much higher than 14.4% reported in Abakalika.[27,43] Repeat CS accounts for about one third of all caesarean deliveries world-wide.[46] The high repeat CS rate in this study could be as a result of relative higher rate (43.8%) of repeat primary CS, with failed VBAC being the commonest indication. VBAC is one of the strategies used to

reduce CS rate.[45] Proper selection and follow-up of pregnant women for trial of labour during ANC and use of partograph to monitor labour positively impact on the success of VBAC.[46] However, it is not known whether the women with failed VBAC in the current study were properly selected. This is because only 48.7% of the pregnant women booked and gave birth in the study facility.

Majority (82.8%) of the intra-operative findings were that of clean abdomino-pelvic cavity. This is because most of the caesarean delivery was primary C.S. However, 56(16.3%) intra-abdominal adhesions were reported among the women with repeat CS. These intra-abdominal adhesions are associated with increased risk of intra-operative blood loss, blood transfusion, bladder injury, bowel injury and increase intra-operative time.[48]

The perinatal death in this study was 6.4% and is slightly higher than 5.2% reported in Sokoto, but lower than 8.9% reported in Kano.[26,27]

In the current study 66 (19.2%) women had post-operative complications that were mainly anaemia and surgical site infection. The commonest complications reported by Attah et al in Kano were post-operative pyrexia and wound infection, which gave a morbidity of 29.2% in the study.[26]

This study found significant association between category of CS and type of anaesthesia; and also between type of CS and type of anaesthesia.

Conclusion

The Caesarean section rate in this study is close to the rate recommended by WHO, however the repeat Caesarean section rate is high. Adequate counseling on need for antenatal care in addition to education on dangers of attempting home delivery and vaginal birth after 2 or more Caesarean section is imperative to avert maternal and neonatal complications.

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Nil

Conflicts of interest
The authors declare no conflicts of interest.

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