

## OUTCOME OF CAESAREAN DELIVERY AT THE AMINU KANO TEACHING HOSPITAL, KANO

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### ABSTRACT

**Objective:** To determine the sociodemographic characteristics, indications and fetomaternal outcome among patients who had Caesarean section at Aminu Kano Teaching Hospital, Kano, Nigeria.

**Methods:** A review of all Caesarean sections (C/S) that were performed at Aminu Kano Teaching Hospital, Kano, Nigeria, between 1st January 2001 and 31st December 2005 was carried out. The study variables of interest were the sociodemographic characteristics of the patients, indications and types of C/S, and fetomaternal outcome.

**Results:** The caesarean section rate in this review was 13.7%. Emergency C/S accounted for 87.9%, while 12.1% were done electively. Among them 52.4% were booked while 47.6% were unbooked, giving a C/S rate of 9.2% for booked and 29.2% for unbooked patients respectively. The leading indications for emergency C/S were pre-eclampsia/eclampsia and cephalo-pelvic disproportion (CPD)/obstructed labour, while for elective C/S, it was two or more previous C/S and breech presentation. The maternal mortality rate was 262.3/100,000, due mainly to pre-eclampsia/eclampsia, CPD/obstructed labour, sepsis and postpartum haemorrhage. Perinatal mortality was 19.7/1000, with birth asphyxia, prematurity and neonatal sepsis being the leading causes. Fetomaternal morbidity and mortality were significantly higher among unbooked patients and those that had emergency C/S. There was increasing trend in the C/S rate during the period of study from 12.7% in 2001 to 14.8% in 2005 ( $\chi^2_{trend} = 5.254, P = 0.02190$ ).

**Conclusion:** Pre-eclampsia/eclampsia and (CPD)/obstructed labour were the leading indications for C/S in this study. Unbooked status and emergency C/S were found to be responsible for most of the fetomaternal morbidity and mortality. There is the need for increasing efforts to ensure that our pregnant women avail themselves of the available antenatal care facilities, in order to reduce the fetomaternal morbidity and mortality from caesarean section.

**KEYWORDS:** Caesarean section, incidence, sociodemographic characteristics, indications, fetomaternal outcome.

### INTRODUCTION

Caesarean section (C/S) is a surgical method of delivering the baby from the pregnant mother.<sup>1,2</sup> This is usually done as an elective or planned procedure at term when the baby is matured<sup>1-3</sup> but could also be done as an emergency when life threatening complications to mother or baby occur.<sup>1-3</sup> The operation originated many centuries ago, but from the 20<sup>th</sup> century onwards it became an accepted technique in difficult labours, complicated maternal health and situations when the baby's wellbeing in utero was getting compromised.<sup>4</sup> Today, caesarean section is the most common obstetric operation that is performed in the world.<sup>3-11</sup> Caesarean section once performed, paves way for a repeat caesarean section after, with repercussions on future obstetric and gynaecological outcomes, which include the adherent bladder which can pose multiple problems in future pregnancies or during hysterectomy. There is also the difficulty in deciding on trial of vaginal birth after caesarean section (VBAC) against the consequences of not giving such a trial and choosing to perform a repeat caesarean section instead.<sup>3,4,12,13</sup>

In the United States of America, the CS rate is at record high of 31.1% of all births, representing an increase of 30%

in the past decade.<sup>4,5</sup> In developing countries 8-27% of all births are estimated to occur by caesarean delivery.<sup>6-11,14</sup> World Health Organization estimated an 'optimal' national caesarean delivery rate between 5% and 15% of all births, which suggest that levels less than 5% sometimes indicates limited availability of caesarean facilities for the rural and poor people of the world, like in Madagascar where the caesarean delivery rate was 1.5-2.3%, while rates above 15% seem to do more harm than good.<sup>3,4</sup>

Ironically there is aversion to this procedure especially in developing countries like Nigeria, because of ignorance, poverty and socio-cultural reasons.<sup>12-14</sup> In our society a woman who cannot achieve vaginal delivery is perceived as a reproductive failure.<sup>12,13</sup> This determination to achieve vaginal delivery usually lead to delay in presentation, which itself is associated with poor fetomaternal outcome.<sup>15-19</sup>

Recent studies from Nigeria have shown increasing safety of this procedure, because of better surgical skills and anaesthetic techniques.<sup>6,17</sup> It is against this background that this study was designed to assess the pregnancy outcome among women who had caesarean section in our unit, so that recommendations can be made on how to improve its safety, acceptability and utilization.

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## MATERIALS AND METHODS

A review of all Caesarean sections that were performed at Aminu Kano Teaching Hospital, Kano, Nigeria, between 1<sup>st</sup> January 2001 and 31<sup>st</sup> December 2005 was carried out, to determine the incidence, sociodemographic characteristics, indications and types of C/S, and feto-maternal outcome.

Aminu Kano Teaching Hospital, is a tertiary health care delivery centre that is located in Kano City, in predominantly Islamic Kano State. It is the most populous state in Nigeria, with a population of over ten million people (2006 Nigerian census), consisting mainly of Hausas/Fulani's, and it is the centre of commerce in Northern Nigeria. It has a land area of 20,760 square Kilometers. The health facility receives patients' referral from hospitals in the state, and neighboring states of Jigawa and Katsina.

For the purpose of this study, unbooked patient was a woman who did not receive antenatal care in our hospital. Urinary tract infection referred to urinary symptoms with positive urine culture (at least  $10^6$  bacteria per ml of urine). Puerperal pyrexia was when a temperature rise of  $38^{\circ}\text{C}$  or more occurred on any 3 of the first 10 days of the puerperium after the first 24 hours. Malaria infection was said to be present if there was at least one asexual parasite per 200 white blood cells in a thick blood film, while a negative slide was when there was no asexual form found after counting 1,000 white blood cells. Wound sepsis was said to occur if there were indurations and swelling of the wound edges, discharge of pus or wound dehiscence. Puerperal sepsis was a series of febrile disorders of the lying-in period which is caused by several genera of pathogenic bacteria. Perinatal mortality refers to the sum of the stillbirths (deaths between the 28<sup>th</sup> weeks of gestation and before delivery the baby) and in the first week of life in a given population. Maternal mortality is the death of a woman in pregnancy or within 42 days of termination of pregnancy, irrespective of the duration or the site of the pregnancy. "Maternal Request" caesarean is mothers' request for elective C/S in an uncomplicated pregnancy, when it is not clinically indicated. Obstetric neglect was when a woman in labour was poorly supervised and the labour lasted more than 24 hours.

The patients and/or their relatives were counseled about the study and consent for inclusion was obtained. The data were prospectively collected on a predesigned proforma and retrospectively analysed. Where the patients could not volunteer information, like among the eclamptic patients, they were collected from their relatives. The exclusion criteria were patients who did not give consent for inclusion in the study. Qualitative data were recorded in percentages, and quantitative data in mean and standard deviation. Statistical analysis for significant difference was done using chi-square and exact probability tests. A P-value of less than 0.05 was considered significant.

## RESULTS

The total number of patients who delivered in our labour ward during the period of study was 9532, of which 7435 were booked and 2097 were unbooked. Among them 1306 patients had C/S giving a C/S rate of 13.7%. Elective C/S accounted for 158 patients (12.1%), while 1148 patients (87.9%) had emergency C/S. All the patients/relatives gave their consent for inclusion in this study.

The age range of the patients was between 15 to 44 years, with a mean of  $20.4 \pm 1.0$  years. The highest frequency (43.5%) was found among the 15-19 years age group, and the least frequency was among the  $\geq 40$  years age group. The parity ranged from 0 to 12, with a mean of  $1.2 \pm 0.2$ . The highest frequency of C/S (55.1%) was found among the Para 0 group, and the least among Para 2. Among those that had C/S 684 patients (52.4%) were booked, while 622 patients (47.6%) were unbooked, giving a C/S rate of 9.2% for booked and 29.7% for unbooked patients respectively. C/S was statistically significantly higher among unbooked patients ( $\chi^2=588.4$ , DF=1,  $P<0.05$ ) as shown in Table 1A.

Majority of the patients were Hausa/Fulani (72.4%), Moslems (77.3%), House wives (68.5%), who had Qur'anic education only (54.5%), and from the low socioeconomic class (75.6%) as shown in table 1B.

The commonest indication for elective C/S was two previous C/S (3.2%), followed by breech presentation (3.1%) and one previous C/S (1.1%). The commonest indication for emergency C/S was pre-eclampsia/eclampsia (37.8%), followed by CPD/obstructed labour (31.0%), fetal distress (12.5%) and failed induction of labour (9.5%). The least frequency among those who had elective C/S (0.8%) and those who have emergency C/S (2.0%) occurred among those with bad obstetric history. This information was shown in table 2.

Among the patients, 556 women had morbidity, giving a morbidity rate of 42.6%. Among them 164 patients (29.5%) were booked, while 392 patients (70.5%) were unbooked. Morbidity rate was statistically significantly higher among unbooked patients ( $\chi^2 = 81.37$ ,  $df = 1$ ,  $P < 0.05$ ). Among those who had elective C/S; 29 patients (18.4%) had morbidity, which was mainly due to urinary tract infection and puerperal pyrexia secondary to malaria fever, while 527 patients (45.9%) had morbidity among those who had emergency C/S, which was mainly due to wound sepsis and puerperal sepsis from genital tract infection. Morbidity rate was statistically significantly higher among patients who had emergency C/S ( $\chi^2 = 19.69$ ,  $df = 1$ ,  $P < 0.05$ ).

There were 25 cases of maternal deaths giving a maternal mortality rate of 262.3/100,000 births, and a case fatality rate of 1.9% for C/S. There were 5 maternal deaths among the booked patients, and 20 maternal deaths among unbooked patients, giving a maternal mortality rate of 0.7% for booked patients, and 3.2% for unbooked patients. Pre-eclampsia/eclampsia (56%), CPD/obstructed labour

(24%), sepsis (12%), postpartum haemorrhage (8%) were the causes of maternal deaths. Maternal mortality was statistically significantly higher among the unbooked patients ( $\chi^2 = 257.2$ ,  $df = 1$ ,  $P < 0.05$ ). Among the patients

who had elective C/S, there were 2 maternal deaths, while among those who had emergency C/S there were 23 deaths, giving a maternal mortality rate of 1.3% for elective C/S and 2.0% for emergency C/S. Maternal mortality was

**Table 1: Socio-Demographic Distribution of the study population**

**Table 1A: Age, Parity and Booking status**

Variable	Frequency (%)
<b>Age</b>	
15-19	568 (43.5)
19-24	317 (24.3)
25-29	163 (12.5)
30-34	116 (8.9)
35-39	99 (7.6)
>40	43 (3.3)
<b>Total</b>	<b>1306 (100)</b>
<b>Parity</b>	
0	719 (55.1)
1-4	514 (39.4)
≥5	73 (5.5)
<b>Total</b>	<b>1306 (100)</b>
<b>Booking status</b>	
Booked	684 (52.4)
Unbooked	622 (47.6)
<b>Total</b>	<b>1306 (1306)</b>

$\chi^2 = 588.4$ ,  $df = 1$ ,  $P < 0.05$  (statistically significant)

**Table 1B: General Characteristics of the study population**

Characteristics	Frequency n(%)
<b>Ethnic group</b>	
Hausa/Fulani	946 (72.4)
Igbo	243 (18.6)
Yoruba	92 (7.0)
Others	25 (1.9)
<b>Religion</b>	
Islam	1010 (77.3)
Christianity	296 (22.7)
<b>Educational status</b>	
Qur'anic only	712 (54.5)
Primary/secondary	461 (35.3)
Tertiary	133 (10.2)
<b>Social class</b>	
Low	987 (75.6)
High	319 (24.4)
<b>Occupation</b>	
Housewife	895 (68.5)
Civil servant	204 (15.6)
Business	167 (12.8)
Others	40 (3.1)

**Table 2: Indications for the C/S among the study population**

Indications	Emergency	Elective
Pre-eclampsia/eclampsia	494 (37.8)	-
CPD/Obstructed labour	405 (31.0)	-
Fetal distress	163 (12.5)	-
Failed Induction	124 (9.5)	-
Placenta previa	78 (6.0)	19 (1.5)
Breech presentation	61 (4.7)	41 (3.1)
Two or more previous C/S	56 (4.3)	42 (3.2)
One previous C/S	37 (2.8)	14 (1.1)
Bad obstetric history	26 (2.0)	10 (0.8)
Others	119 (9.1)	36 (2.8)

**Table 3: Maternal Morbidity, Maternal and Perinatal Mortality Distribution Among the study population**

Variable	Frequency	Maternal morbidity rate (% of frequency)
<b>Booking status</b>		
Booked	164	23.9
Unbooked	392	63.0
Total	556	42.6

$\chi^2 = 81.37$ ,  $df = 1$ ,  $P < 0.05$  (statistically significant)

Type of C. S.	Frequency	Maternal morbidity rate (% of frequency)
Elective	29	18.4
Emergency	527	45.9
Total	556	42.6

$\chi^2 = 19.69$ ,  $df = 1$ ,  $P < 0.05$  (statistically significant)

Variable	Frequency	Maternal mortality rate (% of frequency)
<b>Booking status</b>		
Booked	5	0.7
Unbooked	20	2.0
Total	25	1.9

$\chi^2 = 257.2$ ,  $df = 1$ ,  $P < 0.05$  (statistically significant)

Type of C/S	Frequency	Maternal mortality rate (% of frequency)
Elective	2	1.3
Emergency	23	2.0
Total	25	1.9

$\chi^2 = 141.7$ ,  $df = 1$ ,  $P < 0.05$  (statistically significant)

Variable of frequency)	Frequency	Perinatal mortality rate (%)
<b>Booking status</b>		
Booked	51	7.3
Unbooked	138	21.5
Total	188	2.0
$\chi^2 = 51.5$ , $df = 1$ , $P < 0.05$ (statistically significant)		
<b>Type of C/S</b>		
Elective	-	-

**Table 4: Trend in caesarean births and institutional births by year between 2001- 2005**

Year	Frequency of C/S	Total Births	C/S rate (%)
2001	212	1721	12.7
2002	231	1788	12.9
2003	263	1932	13.6
2004	291	2006	14.5
2005	309	2085	14.8
Total	1306	9532	13.7

$\chi^2$  trend = 5.254, P= 0.022 (statistically significant)

statistically significantly higher among the patients who had emergency C/S ( $\chi^2 = 141.7$ , df= 1, P<0.05).

There were 188 cases of perinatal deaths, giving a perinatal mortality rate of 19.7/1000 births, with birth asphyxia (55.9%), prematurity (23.9%) and neonatal sepsis (18.1%) being the main causes. There was no perinatal death among those who had elective C/S. There were 51 cases of perinatal deaths among the booked patients, and 137 cases among unbooked patients, giving a perinatal mortality rate of 7.5% for booked, and 22.0% for unbooked patients. Perinatal mortality was statistically significantly higher among unbooked patients ( $\chi^2 = 51.5$ , df = 1, P < 0.05). this was as shown in table 3.

The yearly trend over the study period as shown in table 4 showed increase in the C/S rate from 12.7% in 2001 to 14.8% in 2005. which was statistically significant ( $X^2_{trend} = 5.254$ , P= 0.02190).

## DISCUSSION

The C/S rate of 13.7% in this review is within the range of 8.0 to 27.0% quoted in various studies from Nigeria.<sup>6-12,14</sup> It was also similar to 12.0% National Caesarean section rate of Great Britain,<sup>3,20,21</sup> and within 5% and 15% of all births set by the World Health Organisation (WHO).<sup>3</sup> It is however lower than 24.0% National C/S rate of United States of America (USA).<sup>4,5</sup> This has been attributed to the higher number of litigation cases in USA than in Nigeria and Great Britain, increase in the number of 'maternal request' caesareans, and changes in the population of childbearing women, such as older maternal age which is associated with medical conditions.<sup>4</sup>

Majority of the patients were Hausa/Fulani Muslims, which may be because our hospital is located in a predominantly Hausa/Fulani Muslim community. Most of the patients were unbooked teenage primigravida, from the low socioeconomic class, who had Qur'anic education only, probably because the main indications for C/S in this study, were pre-eclampsia/eclampsia and CPD/obstructed labour that are associated with low level of western education, poverty, teenage pregnancies and unbooked status, which are common in our community where early marriage is the norm. This may also explain why majority of the patients were housewives, which is similar to the findings of authors from predominantly Islamic communities like ours.<sup>10,14,16,22</sup>

There is a yearly increase in the C/S rate in our unit

during the study period, which agrees with the global trend.<sup>2-5,10</sup> This has been associated with increase in the indications for C/S with time, as a result of changing population of our maternity patients and advanced health-care technologies like the use of Cardiotocography in labour monitoring, which are becoming more widely available.<sup>2-4,6,7</sup> "Maternal Request" caesareans are not yet common in our community.<sup>3,4,5</sup>

Elective C/S accounted for 12.1% of the cases, while 87.9% had emergency C/S, which may be because leading indications in this study are associated more with emergency C/S. This is similar to the findings of other authors from Nigeria.<sup>6-11,14</sup>

The high prevalence of unbooked teenage primigravidae, who are high risk for pre-eclampsia/eclampsia and CPD/obstructed labour in our society in North West Nigeria because of early marriage,<sup>23,24</sup> may explain the pre-eminence of pre-eclampsia/eclampsia as the commonest indication, followed by CPD/obstructed labour, fetal distress and failed induction of labour in this study, and that from Sokoto<sup>14</sup> also in North West Nigeria, and why it did not agree with the order of frequency of CPD/obstructed labour followed by repeat C/S, antepartum haemorrhage, pre-eclampsia/eclampsia, and failed induction of labour from communities where women delay marriage.<sup>8,9,11</sup> The high prevalence of CPD/obstructed labour in most studies from developing countries has been attributed to anthropological problem of stunted growth and contracted pelvis from high prevalence of childhood malnutrition.<sup>22</sup>

Two previous C/S was the commonest indication for elective C/S, which agrees with the findings of other authors,<sup>8,11</sup> because the risk of rupture is 5 times greater for 2 previous caesarean deliveries compared with 1 previous caesarean delivery, which has made repeat elective caesarean section performed after 2 caesarean sections to be acceptable as normal practice.<sup>4</sup> The second leading indication which was breech presentation did not agree with that of some authors.<sup>8,11</sup> The high frequency of breech presentation as an indication for elective caesarean section in this study, may be because of the high prevalence of young teenage mothers with pelvic immaturity in our society.<sup>19-21</sup> More obstetricians now will opt for planned elective caesarean section, which is associated with lower rates of perinatal and neonatal death, lower rates of short term neonatal morbidity and fewer 5minutes Apgar score <7 compared to vaginal birth.<sup>4</sup> External cephalic version is not practiced in our unit, probably because it has been found that the incidence of breech at term remains unchanged at 3% in spite of external cephalic version,<sup>3,16</sup> and planned elective caesarean section is safe in our unit as seen in this study. The advocates of external cephalic version argue that when it is done at 37<sup>th</sup> week and above, it reduces the caesarean section rate, birth asphyxia and perinatal mortality rate that is associated with breech delivery.<sup>2,3</sup> Its place in the management of breech presentation still

remains controversial.<sup>2</sup>

The higher maternal morbidity and mortality among unbooked patients and those who had emergency C/S, agree with the findings of other authors,<sup>8-11,15-18</sup> probably because booked status will allow for planned elective C/S, or early intervention where indicated, thereby avoiding delay and ensuring good foeto-maternal outcome.<sup>2,5,8,19-24</sup>

An overall morbidity rate of 42.6% is similar to 44% that was reported from Maiduguri in North East Zone,<sup>22</sup> but higher than 15% that was reported from Lagos in South West Zone.<sup>25</sup> Also the C/S case fatality rate of 1.9% in this study is lower than 0.71% from Ile-Ife<sup>7</sup>, and 0.51% from Lagos,<sup>25</sup> all in South West Zone in Nigeria, which may be because Emergency Obstetric Care is better established and more functional in South West than in the Northern parts of Nigeria.<sup>26</sup>

In this study, pre-eclampsia/eclampsia, CPD/obstructed labour, sepsis followed by postpartum haemorrhage in decreasing order of frequency were the leading causes of maternal deaths, which agrees with the order of frequency in studies from Sokoto,<sup>14</sup> a predominantly Islamic society like ours, with similar sociocultural background. It did not agree with postpartum haemorrhage, puerperal sepsis, pre-eclampsia/eclampsia, and CPD/obstructed labour in decreasing order of frequency from communities where women delay marriage,<sup>11</sup> probably because of high incidence of teenage primigravida who are high risk for pre-eclampsia/eclampsia and CPD/obstructed labour in our predominantly Islamic society, where early marriages are common.<sup>23,24</sup>

Urinary tract infection secondary to urethral catheterization and puerperal pyrexia secondary to malaria fever, were the commonest causes of morbidity among those who had elective C/S, while among those who had emergency C/S, it was wound sepsis, followed by puerperal sepsis from genital tract infection. This is similar to the findings in other studies.<sup>7,8</sup> Delay in presentation in the hospital has been said to be responsible for the difference in the types of morbidity among these two groups.<sup>2-6,8,9,14</sup>

The perinatal mortality rate of 140/1000 births in this review, is similar to 162/1000 reported in Kaduna,<sup>5</sup> and 111/1000 in Sokoto<sup>14</sup> in North West Nigeria, but is higher than 82/1000 from Jos<sup>8</sup> in North Central Nigeria, and 62/1000 from Ile-Ife in South West Nigeria.<sup>3</sup> The high incidence of perinatal mortality in North West Nigeria, has been attributed mainly to severe birth asphyxia, because of higher prevalence of unbooked teenagers who are high risk for pre-eclampsia/eclampsia and CPD/obstructed labour in our maternity population.<sup>5,14</sup> This could also explain why birth asphyxia, prematurity and neonatal sepsis were the commonest causes of perinatal deaths in this study. All the perinatal deaths occurred among those who had emergency C/S, and were more among unbooked patients, which agrees with the findings of other authors,<sup>8,9,14,16</sup> and has been ascribed to delay in presentation.<sup>14</sup> This further emphasizes the protective effects of antenatal care and early presentation in the hospital when in labour.

## CONCLUSION

Pre-eclampsia/eclampsia and CPD/obstructed labour were the commonest indications for C/S in this study. Unbooked status and emergency C/S were found to be responsible for most of the foeto-maternal morbidity and mortality.

Campaign for antenatal care and hospital delivery should be intensified in our community if maternal morbidity and mortality from this procedure is to be reduced, and the targets of Millennium Development Goals 4 and 5 is to be achieved. In a predominantly Islamic society like ours, where early marriage and teenage pregnancies are common, improvement in the socioeconomic status of our women and involvement of the husbands, community and religious leaders is essential to overcome the economic, socio-cultural and religious barriers, and ensure success of this campaign.

Limitations of the study- This is a hospital based study. A larger multicentre study, which will also involve the both the government owned and private hospitals will be required, to give a better picture of the fetomaternal outcome following caesarean section in our community.

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