

Cesarean Section Trends and Outcomes in Jinja Regional Referral Hospital: A Retrospective Analysis

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ABSTRACT

This research aimed to analyze the patterns and consequences of Cesarean sections (C-sections) performed at Jinja Regional Referral Hospital. Conducted retrospectively, the study focused on pregnant women who underwent C-sections instead of vaginal delivery between January 1st and June 30th, 2019. The investigation excluded cases of normal vaginal deliveries and used a systematic random sampling method to select 288 participants for review. Data from patient files was collected, assessed using a checklist, and analyzed using Stata version 14. Results were presented using frequency tables, percentages, pie charts, and bar graphs. The study found a C-section prevalence of 30%, surpassing the WHO-recommended 15% rate for developing nations. The primary reasons for C-sections were cephalopelvic disproportion, repeat C-section, fetal distress, and breech presentation. Overall, 72.22% of cases had positive outcomes. Poor outcomes were predominantly fetal, including low Apgar scores (<7), low birth weight, neonatal death, NICU admission, and asphyxia, accounting for over 90% of negative outcomes. Maternal outcomes were mostly positive, with poor results including maternal sepsis, maternal death, postpartum hemorrhage, and burst abdomen. In summary, the study highlighted a high rate of C-sections and identified specific indications for the procedure. Poor fetal outcomes were often associated with low birth weight, while poor maternal outcomes were primarily linked to postpartum hemorrhage and maternal sepsis.

Keywords: C-section, Vaginal delivery, Perinatal, Fetal distress, Breech presentation.

INTRODUCTION

The indications for CS have varied tremendously through its documented history, and they have been shaped by religious, cultural, economic, professional and technological developments. Cesarean section has been part of human culture since ancient times, but the early history of CS remains unclear. It is commonly believed to be derived from the surgical birth of Julius Caesar, but this seems unlikely since his mother Aurelia is reputed to have lived to hear of her son's invasion of Britain. At that time the procedure was performed only when the mother was dead or dying, in an attempt to save the child. Cesarean sections were also made because of religious beliefs so that the baby could be buried separately from

the mother. The operation was not intended to preserve the life of the mother. It was not until the nineteenth century that saving the mother was a possibility [1]. Regarding surgical procedure of caesarean section, there are 2 types mostly, the common lower uterine segment incision used in over 95% of caesarean sections and the upper uterine segment incision. The upper segment incision is always recommended due to ease of repair, reduced blood loss and low incidence of dehiscence or rupture in subsequent pregnancies. Classical caesarean section incision is indicated when it is difficult to perform lower uterine segment incision or in placenta previa and transverse lie with the back down [2]. In general, the

indications of caesarean section are divided into two categories: absolute and relative. The absolute indications are cephalopelvic disproportion, previous uterine surgery, prior uterine rupture and previous successful repair of vesicovaginal fistula. The relative indications are failed induction of labour, placenta Previa, placental abruption, fetal distress, cord prolapse, maternal disease (preeclampsia and diabetes), cord presentation in labour, macrosomia, and fetal malpresentation (breech, brow, face and shoulder presentation)[3]. Today, a caesarean section is usually performed when a vaginal delivery would put the baby's or mother's life or health at risk, although in recent times it has also been performed upon request for childbirths that could otherwise have been natural. In later years the rate has risen to a record level of 46% in China, and levels of 25% and above in many Asian, European and Latin American countries. In 2009 the caesarean section rate was 34% in the United States. Across Europe, there are significant differences between countries: in Italy, the rate is 40%, while in the Nordic countries, it is about 17-20%.[4]. In recent years, the rate of caesarean deliveries increased dramatically worldwide and many countries have exceeded the WHO recommended rate [5]. In 1985, an expert group in WHO stated that 15 % should be the upper limit for the number of caesareans in a country. The number was based on the section rate in some countries with low perinatal morbidity. The USA put 15 % as a goal for 2000 but did not reach it. In 2009 WHO revised its guidelines, still recommending a CS rate between 5 and 15 % [6]. In 1967, The Norwegian Medical Birth Registry started to register all births in Norway. At that time, almost 2 % of the babies were delivered with caesarean section [7]. In the 1990s, it was about 12-13 %, and in 2011 it was 17%[8]. The increase in the amount of caesarean deliveries can partly be explained with increased use of technical, medical equipment. During labour, it is now easier to discover risks concerning the mother and the baby earlier. The increase can also be explained by increasing age among mothers, maternal requests, that more

women have had previous caesarean sections, and because it has become more common with multiple babies [9]. In a study done in Uganda in 2016 [10], Uganda had a total CS rate of 18% with Mbarara regional referral hospital having the highest percentage of 37% jinja regional referral had a CS rate of 28 % which was above the recommended WHO rate. Caesareans are the most commonly performed surgery accounting for one-third of all operations in Africa, with higher postoperative morbidity and mortality than in other regions [11]. In many countries today, especially wealthy ones, surgical deliveries (caesarean sections) represent a significant proportion of all births; in 2014, rates in some countries (e.g., Brazil and Cyprus) exceeded 50%; and in 26 nations the rates exceeded 30%[12].

The World Health Organization (WHO) affirms that there is no justification for caesarean rates higher than 10 %-15 %, and defines these numbers as limiting rates. Globally, approximately 15 in 100 pregnant women require CS to prevent poor outcomes for them and/or their newborns [13]. However, the Rates of CS are increasing globally. The average global CS rate has increased by 150% over the past 25 years, and is currently at 18.6% with an average rate of increase of 4.4% per year[12]. Worldwide, CS rates have increased tremendously in recent years, especially among high-income countries, raising concerns about over-utilization of CS without added benefits [13]. In many countries today, especially wealthy ones, surgical deliveries (caesarean sections) represent a significant proportion of all births; in 2014, rates in some countries (e.g., Brazil and Cyprus) exceeded 50%; and in 26 nations the rates exceed 30%[12], WHO global survey carried out in 24 countries showed that most African countries recorded an average CS rate of 9% [14]. In a study done in Uganda in 2016 by [10], Uganda had a total CS rate of 18% with Mbarara regional referral hospital having the highest percentage of 37% jinja regional referral had a CS rate of 28 % all of which is above the recommended WHO rate. High Caesarean section rates while indicating adequate access to essential and

lifesaving obstetric care, are not associated with improved maternal and fetal outcomes; in fact in studies, such as a survey in 2005 on maternal and perinatal health in Latin America, Villar and other researchers found that high Caesarean section rates were associated with harm. [15] Caesarean sections can cause significant and sometimes permanent complications, disability or death, particularly in settings that lack the facilities and/or capacity to properly conduct safe surgery and treat surgical complications. Caesarean sections should ideally only be undertaken when medically necessary. [16]. The increased risks of maternal and perinatal morbidity and mortality associated with high Caesarean

section rates underlie the growing concern by health professionals; Obstetricians in the UK haCommiteeve instituted studies to address the issue [17]. A woman who delivers by Caesarean section gets a uterine scar. This scar has important implications for future pregnancies; she is predisposed to uterine rupture, placenta praevia and placenta accreta [18]. Induction of labor in a woman with a previous C-section carries a higher risk of uterine rupture than in a woman with no previous C-section [19]. However, this study will identify the indications and outcomes of caesarean section among pregnant women attending delivery at Jinja Regional Referral Hospital in the year 2019.

METHODOLOGY

Study design

The study was a retrospective study, which reviewed patient files from the Records Department at JRRH covering the period from January 1st to June 30th 2019.

Area of Study

Jinja regional referral hospital is located in the industrial town of Jinja, 80 km east of the capital city, Kampala, in the eastern region of Uganda. Established in the 1920s it now serves as both a primary contact hospital and as a regional referral hospital for seven districts (Bugiri, Iganga, Jinja, Kaliro, Kamuli, Kayunga, and Mayuge) with an overall population of 3.5 million people. The hospital receives referrals from Buluba, Kamuli, Nyanga, Iganga, Kawoya general hospitals and Bundo, Buwenge, Walukuba, Bugembe, Mpumude and Kangulumira Health Centre fours. The hospital has a bed capacity of 600 with 60 beds for the maternity wing, four of them being labor-suit beds. The neonatal intensive care unit has a bed capacity of 26 beds with 13 of them being neonatal incubators. Furthermore, the Hospital has one main operating theatre with three operation rooms. The theatre serves both the Surgical and Obstetric departments. In 2019 the obstetric and gynaecological department comprised 29 midwives, 3 medical officers and 4 specialists in addition to the medical, Nursing and Midwife interns who also worked in the department for one year. On average, 14 normal deliveries and 5 C-section

deliveries are received daily summing to a total of 19 deliveries every day. Similarly, a total of about 37 mothers are seen daily, approximately 12 coming for their first visit and 25 coming for a revisit appointment.

Study population

The study population included all pregnant women who were admitted to the maternity department of JRRH for delivery and ended by cesarean section during the period of study from 1st of January to 30th of June 2019.

Inclusion criteria

All women who had a cesarean section in JRRH during the period of study. All babies born by cesarean section in JRRH during the period of study.

Exclusion criteria

Mothers who have given birth by Spontaneous Vaginal Delivery. Babies not born by C-section.

Sample size determination

Specific objective one; the sample size will be derived from the formula for [20]. Caesarean section rates and indications at MRRH [20].

$$[n = (1.96)^2 p q \div d]$$

n - Sample size

1.96 - Approximate 95% confidence level

P - Estimated number of women delivering by caesarean section = 0.25

q - Number of estimated women delivering normally (vaginal) i.e. (1-p) = 0.75

d - Absolute precision/ margin of error i.e. 5% = 0.05.

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$$n = 1.96^2 \times 0.25 (0.75) \div 0.05^2$$

n = 288

Sampling technique/ procedure

I used systemic random sampling, where I selected files of women who delivered by C-Section from January up to June 2019. In each month I chose the first fifteen files from top to bottom, fifteen files from the middle section and eighteen files from the bottom upwards making up a total of forty-eight files each month and in the case where the number of C-section cases was less than forty-eight per month then all of them were considered and more than forty-eight cases were considered in a month with more than forty-eight cases to attain the desired sample size of 288 patients.

Data collection instrument

The data was collected by reviewing all records of pregnant women who gave birth from JRRH and ended by caesarean section during the year 2019. By using checklist filled from the patient's file of admission.

Data analysis plan

The Data entry and collecting was undertaken using Microsoft Excel Worksheet. Data was checked for completeness; it was cleaned manually for inconsistencies and missing values before entry and any incomplete checklist was excluded from entry. Then during data entry, data was coded carefully, and cleaning was undertaken by checking the

Socio-demographic characteristics of the study participants

The study enrolled a total of 288 study participants, nearly three-quarters of these were in the age range between 21 and 35 209(72.57%). More than half of the study participants were Christians 190(65.97%) while about a third were Muslims

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categories of all variables for impossible codes. After the entry of the whole checklist was completed, the soft copy of every checklist was once again cross-checked with its hardcopy to avoid missing values, outliers and other inconsistencies before analysis. Data was then analyzed using Stata version 14 (StataCorp.2015. *Stata Statistical Software: Release 14*. College Station, TX: StataCorp LP). Categorical variables were then presented as tables of frequencies and percentages, pie charts and bar graphs.

Quality control

Quality was achieved through the total involvement of the researcher in data collection and close supervision of research assistants and the researcher spent some time training the research assistants Inclusion and exclusion criteria were strictly adhered to. The checklist was checked for competencies before collection to ensure valid data was obtained.

Ethical considerations

This study was approved by the Committee on Human Research, Publications and Ethics of the School of KIU-TH. Approval to conduct the study at Jinja Regional Referral Hospital was obtained from the hospital administration, and all information obtained was treated as confidential [21].

RESULTS

96(33.33%). Similarly, the majority 199(69.1%) of the study participants reported attending either primary or secondary education while only a few reported attaining tertiary education. Over 50% were urban dwellers while over 70% reported informal employment. The details are illustrated in the table 1 below.

Table 1: A demonstration of the demographic characteristics of the study participants

Variable	Frequency(N=288)	Percentages (%)
Age		
16-20	62	21.53
21-35	209	72.57
>35	17	5.90
Religion		
Christian	190	65.97
Moslem	96	33.33
Others	2	0.69
Education		
Primary	83	28.82
Secondary	116	40.28
Tertiary	38	13.19
Others	51	17.71
Residence		
Urban	118	40.97
Rural	170	59.03
Occupation		
Formal	68	23.61
Informal	220	76.39

Gravidity, C-section type, indication and prevalence of C-section

Over a half of the study participants were multigravidas while nearly all (over 95%) had an emergency C-section. Concerning the indication for C-section, a total of 18 indications were noted and out of these, Cephalopelvic disproportion 84(28.77%) was the highest while compound

presentation, face presentation, cord prolapse, cervical dystocia, maternal request, postdate and shoulder dystocia were the least recorded with less than 2% of the study population. Generally, the hospital recorded a total of 3342 deliveries and 1002(30%) of these were delivered by C-section. Details are demonstrated in Figures 1, 2 and 3.

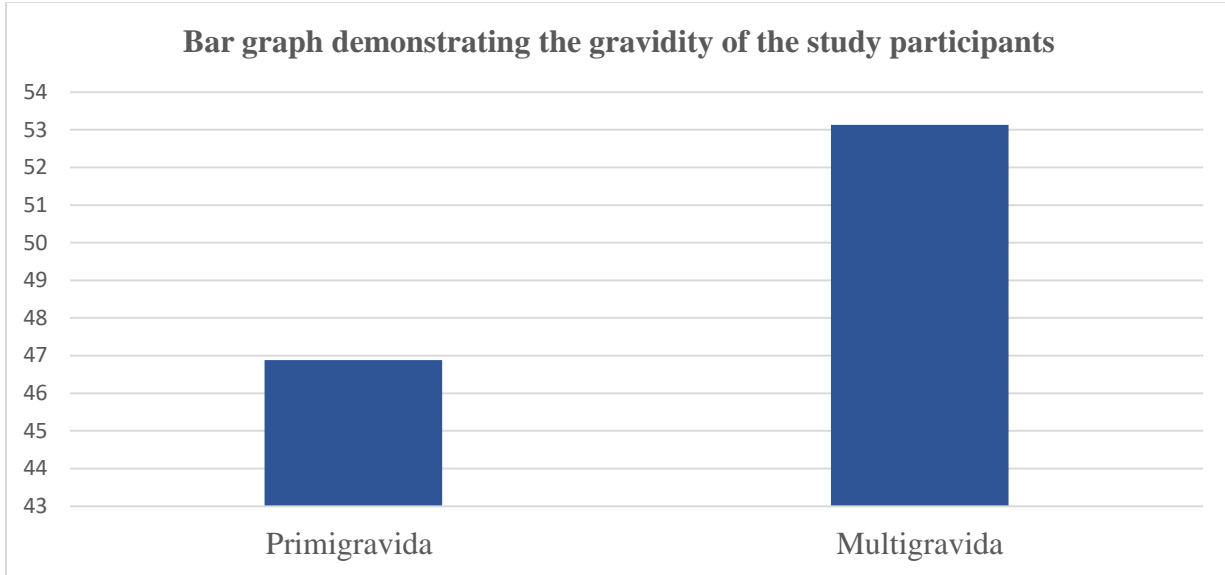


Figure 1: Gravidity of the study participants

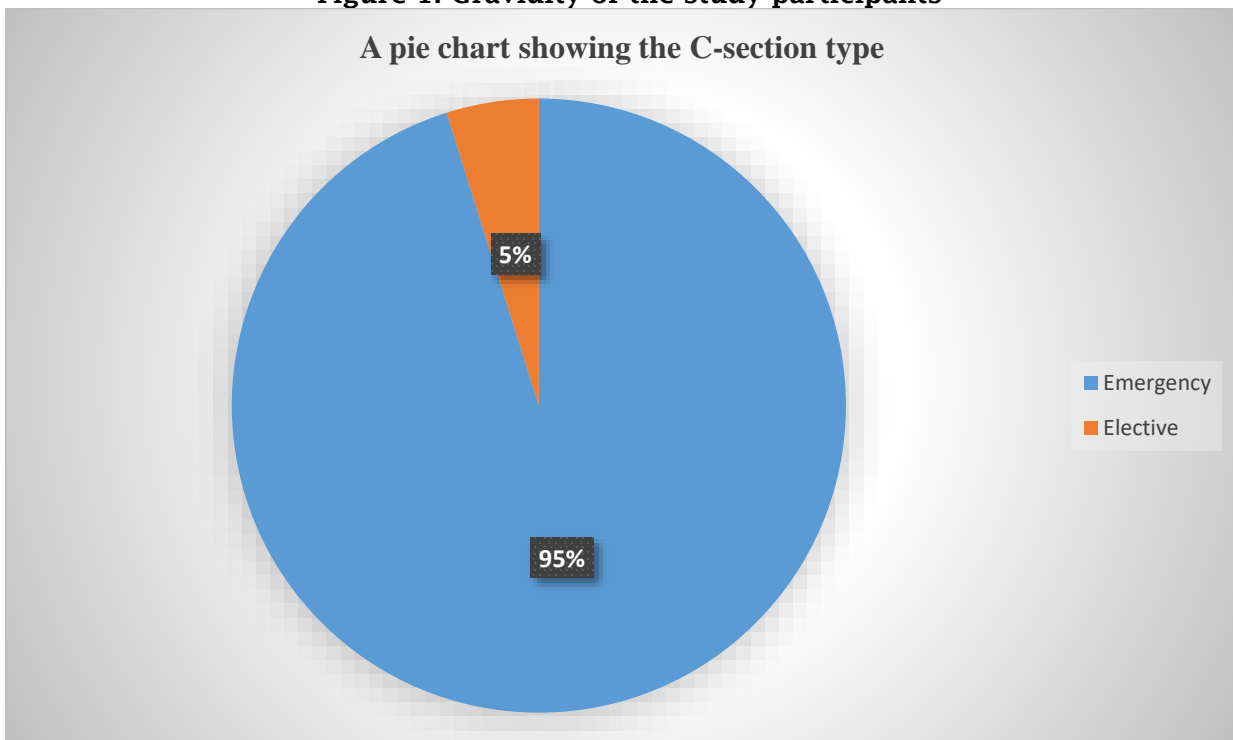


Figure 2: Caesarean section type

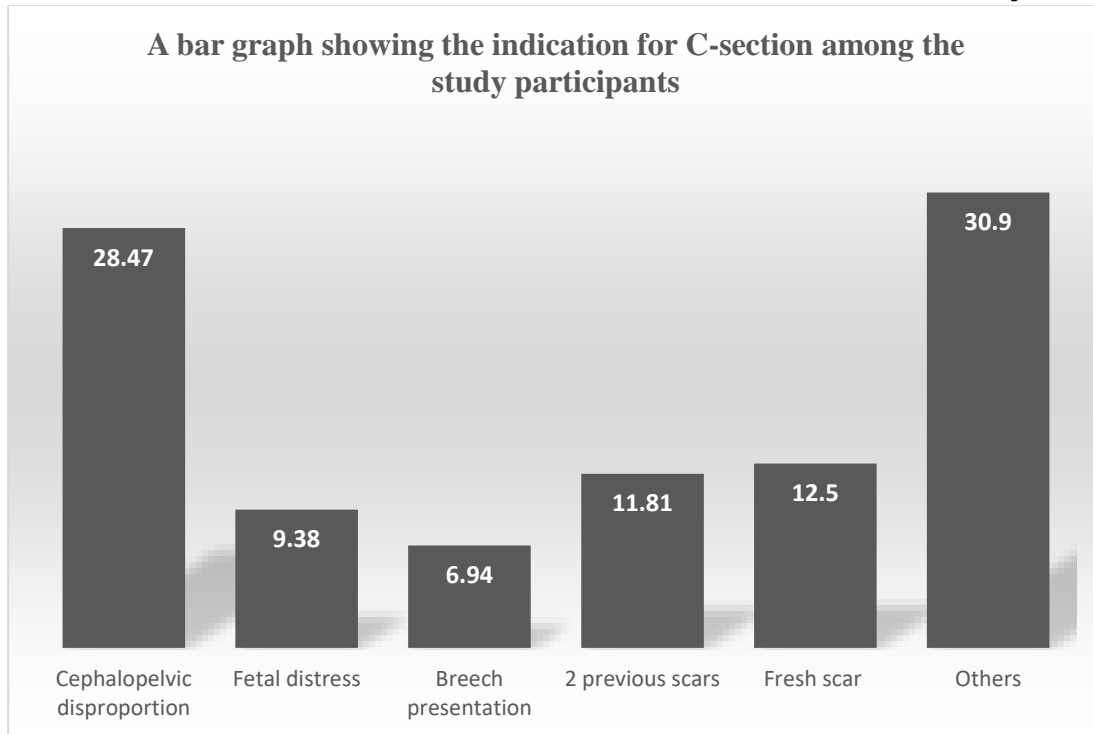


Figure 3: Indication for Caesarean section

Prolonged labour 7(2.4%), Infection 8(2.7%), Transverse presentation 6(2.1%), Compound presentation 4(1.4%), Face presentation 1(0.3%), Cord prolapse 5(1.7%), Cervical dystocia 4(1.4%), Maternal request 3(1.0%), Postdate 2(0.7%), Shoulder dystocia (2(0.7%), Pre-eclampsia 16(5.5%), Antepartum hemorrhage 20(6.9%) and big baby 13(4.6%). Fetal and Maternal outcomes. The fetal outcomes assessed in this study included Apgar score, birth weight, viability of the new born, need for neonatal

care unit admission and birth asphyxia. On the other hand, maternal outcomes were recorded as normal recovery, maternal sepsis, hypovolemic shock, post-partum haemorrhage, burst abdomen and maternal death. Overall, poor outcomes were noted in more than a quarter of 80(27.78%) of the study participants. Less than 4% of these represented poor maternal outcomes while the rest represented poor fetal outcomes. The details are reflected in the table 2.

Table 2: Feto-maternal outcomes of caesarean section

Apgar score	Frequency (N=288)	Percentage (%)
7 above	251	94.36
<7	15	5.36
Weight		
>2.5	248	86.11
<2.5	40	13.89
Viable		
Yes	265	92.01
No	23	7.99
NICU		
Yes	24	8.76
No	250	91.24
Asphyxia		
Yes	22	8.03
No	252	91.97
Maternal		
Maternal sepsis	3	1.04
Maternal death	1	0.35
PPH	6	2.08
Burst abdomen	1	0.35
Normal recovery	277	96.18

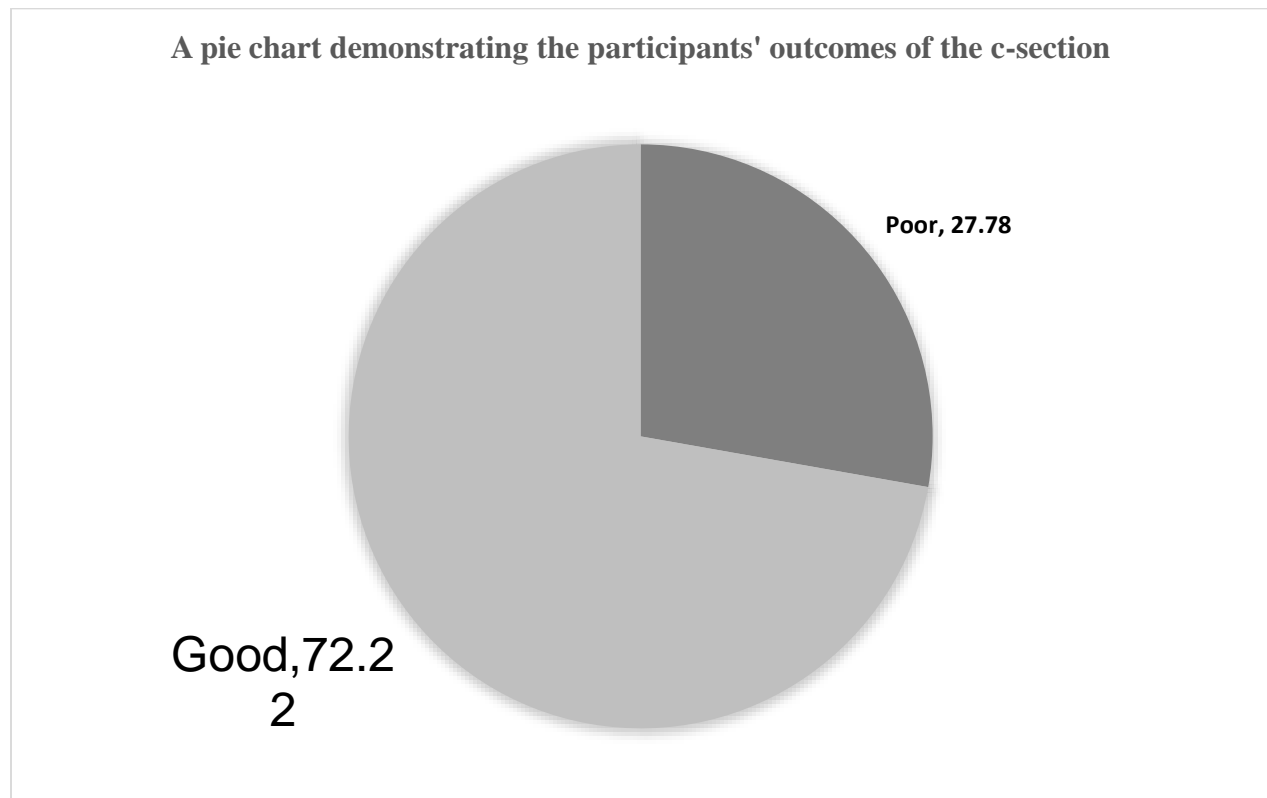


Figure 4: Overall caesarean section outcomes

DISCUSSIONS

This study aimed to determine the prevalence, indications and outcomes of C-

section among women who had attended delivery at Jinja regional referral hospital.

A total of 288 study participants were enrolled. The prevalence of C-section was found to be 30%. These findings are higher than the recommended rate of 10-15% by [22]. On the other hand, however, similar findings have been reported in others studies done in the country. In a study done in Uganda by Atuhaire et al, the researchers projected a national rise in C-sections by 36% from about 25% baseline estimate in referral hospitals [23]. Because of the nature of referral hospitals, there are higher chances that most mothers referred in have more complicated pregnancies and most cases have been delayed or have been tried enough at lower health facilities [24]. This is further supported by the observation that over 95% of the c-sections performed were emergency caesarean sections in our study. The higher rates have also largely been attributed to the better surgical technics, improved anesthesia, effective antibiotics and availability of blood transfusion services. The indications for cesarean section included both maternal and fetal, Maternal indications constituted 72.68% of all caesarean sections in this study, the most common of which is cephalopelvic disproportion (28.47%) which is similar to the study by [25]. Moreover, similar findings have been reported in other developing parts of the world. This can be attributed to the pelvic size and shape which has been linked to childhood malnutrition that is so rampant in developing countries like Uganda. Additionally, previous caesarean section (24.31%) was the other most common maternal indication. Our findings are in accordance with a study by [26] and several other studies. It is important to note that obstetric guidelines recommend that women with prior c-sections with low transverse scars are candidates to vaginal delivery especially if the previous indication is not permanent [27]. However higher repeat c-section could partially be due to the routine performance of repeat c-section due to fear of adverse complications like uterine rupture. Additionally, it may also be due the belief that once a c-section, always a c-section [28]. Fetal distress was the leading fetal indication and it accounted for (9.38%) of

all cesarean sections performed in this study. Our findings are comparable to studies conducted in Bangladesh [29] and Tanzania [30] in which the researchers reported fetal distress (11%) as a fetal indication for c-section. On the contrary, much higher figures have been reported in other studies [31]. The differences in these findings depend on several factors like the study setting, presence of experienced obstetricians and monitoring and diagnostic tools for fetal distress like cardiotocograph, fetal doppler. Likewise, it might as well be attributed to less priority given for conservative management of fetal distress in Jinja Regional Referral Hospital. The fetal outcomes assessed in this study included Apgar score, birth weight, viability of the new born, need for neonatal care unit admission and birth asphyxia. On the other hand, maternal outcomes were recorded as normal recovery, maternal sepsis, hypovolemic shock, post-partum hemorrhage, burst abdomen and maternal death. Most of the fetal outcomes were good, however, 40 neonates weighed below 2.5kgs and 24(8.76%) were admitted in neonate are unit, which was low, compared to the study done by [32]. On the other hand, maternal outcomes were recorded as normal recovery, maternal sepsis, maternal death, PPH and burst abdomen. The study showed that over 96% of the enrolled participants had good maternal outcomes. This might be due to the good ANC follow up that lead to good postoperative outcome. In addition, even though the risk of maternal death after cesarean section is 5 times higher than normal vaginal delivery, there was only one maternal death (0.35%) which is low, compared to study done by [33]-[40]. The most common post-operative complications were PPH 6(2.08%) and maternal sepsis 3(1.04%) which were lower as compared the study done by [4] . The reduction of maternal sepsis might be because of routine use of prophylactic antibiotics associated with clinically important reduction in postpartum febrile morbidity, wound infection and other serious infections. The patients with postpartum hemorrhage might have been successfully managed with uterotronics

and transfusion. Overall, the maternal or fetal outcomes were good in more than 80% of the study participants. This can be

explained by the fact that majority of the patients had normal recovery.

CONCLUSION

Our study revealed a high C-section rate, in fact above the WHO recommended 15% rate for developing countries. Cephalopelvic disproportion, fetal distress, repeat c-section and breech presentation constituted the most common indications for c-section. Furthermore, low birth weight had the biggest proportion of poor fetal outcomes while PPH and maternal sepsis presented the biggest proportion of poor maternal outcomes.

Recommendations

Since cephalopelvic disproportion was the common indication associated with increased Cs rate, mothers should be educated about malnutrition to prevent

this problem through avoidance by enhancing food security. Because the previous cesarean section was the other major maternal indication, it is recommended that trial of vaginal birth after cesarean section should be encouraged in appropriate cases. Use of cardio topography for continuous fetal heart rate monitoring in labor with confirmation of suspected fetal distress through fetal acid-base study is also recommended if resource is available. Furthermore, there is a need for a prospective study to evaluate the reasons for the increasing cesarean section rate in this Hospital.

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