**PROJECT TITLE**

# OBSTRUCTED LABOUR AS AN INDICATION OF OPERATIVE DELIVERY AT KATIMA MULILO STATE HOSPITAL, KATIMA MULILO, NAMIBIA

**STUDENT**


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This research assignment is submitted in partial fulfilment of the requirement for the degree of Master of Family Medicine (M.Med.), Division of Family Medicine and Primary Care, Department of Interdisciplinary Health Sciences, Faculty of Medicine and Health Sciences, Stellenbosch University.

## DECLARATION

I, **Dr. Adeniyi T.A**, the undersigned, hereby declare that the work contained in this assignment is my original work, and that I have not previously submitted it, in its entirety or in part, at any University for a degree. I also declare that ethics approval for the study was obtained from the Health Research Ethics committee of Stellenbosch University (Reference number: S14/03/058).

Signature: . .....

Date: .....March 2017.....

## ABSTRACT

### Background

Obstructed labour is a major cause of maternal and child morbidity and mortality globally. However exact estimates is difficult to quantify as a result of causes of death being classified as resulting from any of obstructed labour complications like sepsis, uterine rupture and bleeding, amongst others.

### Aim and Objectives

This study aims to determine the forms of obstructed labour as indications for operative deliveries at Katima Mulilo hospital in the Zambezi region, Namibia.
The objectives are to determine the types of surgical interventions for obstructed labour and describe the stages of labour during which obstruction occurred.

### Methods

All obstetric records of pregnant women of all ages who had operative deliveries, caesarean section or ventouse delivery, for various indications between 1st January and 31st December , 2011 at Katima Mulilo state hospital were selected for this research.

### Results

Of the 117 patients that had surgery performed in 2011, 67 (57.3 %) had obstructed labour, 19 (16.2%) fetal distress, 17 (14.5%) pre-eclampsia and 12 (10.3%) previous caesarean section. Antepartum haemorrhage (APH), premature rupture of membrane (PROM) in retroviral disease (RVD), florid genital warts and post maturity with failed induction had 2 (1.7%) patients each. Cord prolapse was observed in 4 (3.4%) patients, elderly primigravidarity in 3 (2.6%) patients and elective caesarean section in 1 (0.9%) patient.

Of the factors associated with obstructed labour, cephalopelvic disproportion (CPD) accounted for 19 (28.4%), abnormal presentation 17 (25.4%),delayed first stage 9 (13.4%), delayed second stage 7 (10.4%), breech in primigravida 5 (7.5%), abnormal lie 4 (6.0%), fetal macrosomia 3 (4.5%), cervical dystocia 2 (2.99%) and fetal malpositioning 1 (1.5%). Of the surgical procedures employed during the study period, caesarean section constituted 99.2% while vacuum extraction contributed an insignificant value of 0.8%. Forceps delivery was not employed at all.

### Conclusion

Obstructed labour was the indication for the majority of operative deliveries. Cephalopelvic disproportion followed by abnormal presentation were the main reasons of obstructed labour at Katima Mulilo Hospital. Caesarean section and ventouse were the surgical interventions carried out forpatients with the former employed in nearly all of the patients.
Efforts must be focused on improving antenatal care coverage, the referral system, and providing comprehensive obstetric care in health centres to prevent complications of unmanaged or poorly managed obstructed labour.

## TITLE

# 0bstructed labour as an indication of operative delivery at Katima Mulilo State Hospital, Katima Mulilo, Namibia.

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## INTRODUCTION

Operative deliveries are indicated for obstructed labour. Labour obstruction is still a major cause of maternal morbidity, mortality and adverse outcome for the newborn in resource-limited countries.[1] Maternal complications common among women with obstructed labour are ruptured uterus (7.1%), puerperal sepsis (3.4%), bladder injury (1.8%), postpartum haemorrhage (1.2%), fistulae (1.4%) and occasionally disseminated intravascular coagulation.[1] In addition, death may ensue if patients are not properly managed.

Obstructed labour accounts for 8% of maternal deaths globally.[2]It is probable that the exact figure of maternal deaths resulting from obstructed labour as a primary cause of death is not documented but rather the terminal cause classified for example as sepsis, haemorrhage or ruptured uterus. In a bid to attain Millennium Development Goals (MDG) 4 and 5 with respect to child and maternal mortality respectively, it is worthwhile doing this study in Katima Mulilo to exert more efforts towards combating the rising trend of obstructed labour cases in this context.

This research is expected to create awareness for practitioners in Namibia of the incidence of labour obstruction in Katima Mulilo. Obstructed labour occurs due to a failure of descent of the fetal presenting part in the birth canal despite adequate uterine contractions.[1] An important direct cause of maternal mortality is obstructed labour and this has to be dealt with adequately and timely.[2] In a bid towars tackling the problem of obstructed labour more effectively, the World Health Organization (WHO) has made it its target to reduce maternal mortality to 75% of the 1990 high level by 2015.[3] Globally, maternal mortality since 1990 has nearly halved and access to reproductive health services in developing countries has substantially improved.[4]

Globally, the majority of maternal deaths are due to five causes: postpartum haemorrhage, hypertensive disorders, obstructed labour leading to haemorrhage or infection, unsafe abortion and sepsis.[6,7] Among these etiologies, one of the most common in developing countries is obstructed labour.[7] In most sub-Saharan African countries, obstructed obstructed labour and its complications, in most sub-Saharan African countries have become a major public health problem consuming huge public resources.[5]

The danger posed by obstructed labour, however, in the majority of cases, can only be averted by operative delivery of the fetus, which is most often by caesarean delivery.[7,8,9]
The major cause of obstructed labour from different studies was cephalopelvic disproportion (CPD) being responsible for 80.6% of labour obstruction cases in Jimma University Specialized Hospital (JUSH), Ethiopia; 67% in a Nigerian study and 41.1% in an Indian study.[9] The major operative procedure performed for labour obstruction was caesarean section in 85% of cases in a Nigerian study and 63.3% of cases in an Indian study.[9] Obstructed labour tends to be higher in teaching hospitals than in general hospitals and health centres for reasons of selection and due to the fact that complicated cases get referred to teaching hospitals.[10]

Labour obstruction is usually encountered in pregnancy with fetal malpresentation, malpositioning, abnormalities such as fetal macrosomia, shoulder dystocia, hydrocephalus, anencephaly, spina bifida, encephalocoele, amongst others and maternal soft tissue abnormalities (e.g. fibroids, ovarian tumors or pelvic kidneys, sacculated or cochleate cervix, vaginal stenosis which may be congenital or acquired and congenital vaginal septum). Primigravidarity, especially teenage pregnancies under the age of 16 and grandmultiparity are predisposing factors.[11] Female genital mutilation, also, has been implicated in some studies.[11,12]

Obstructed labour ranked 41st in the Global Burden of Disease (GBD) 1990, representing 0.5% of the burden of all conditions and 22% of all maternal conditions.[13] Short stature occasioned by malnutrition in the underdeveloped countries may predispose to labour obstruction.[13] In the developed world, labour obstruction due to cephalopelvic distruption is rare as a result of some instituted public health measures but encountered occasionally in United Kingdom and other developed countries probably due to failure to anticipate difficulty or to late diagnosis of the cause of prolongation of labour[14]. Grandmultiparous women failing to utilize the already available obstetric services rather than a lack of skill of obstetricians in the developed world might be another explanation for the occasional occurence of this type of labour obstruction .[15]

A wide regional difference in obstructed labour incidence in the same country has been observed. In Ikot Ekpene General Hospital, South-Eastern Nigeria, the incidence appears high when compared to those in some of the other areas in Southern Nigeria. This incidence, however agrees with those obtained in the findings of the studies carried out in Northern Nigeria[16,17] and other developing countries.[17,18,19]

When labour is obstructed, operative delivery with caesarean section and instrumental vaginal delivery with ventouse extractor is employed. A caesarean section is usually carried out in situations where vaginal delivery is contraindicated and hence the mother's and baby's lives are at risk. However, the caesarean section rate has continued to increase in most industrialized countries, which raises a number of economic concerns.[20,21]

Indications for caesarean sections are many and include history of previous caesarean sections, obstructed labour, fetal distress, Herpes simplex Viral infection (with active lesions), Pregnancy induced hypertension (PIH), bad obstetric history or precious baby, antepartum hemorrhage and elderly primigravidarity. A period of more than 4 hours post-amniotomy in HIV positive pregnant mothers is another indication.[22]

In a retrospective cohort study conducted in a Saudi Arabian hospital, of all the caesarean sections performed, two-thirds (67%) were emergency while the remainder (33%) constituted elective caesarean section.The most frequent indications for emergency caesarean sections were difficult labour (35%), fetal distress (21.9%), and breech presentation (11.6%) while previous caesarean section (54.3%), breech presentation(20.4%) and maternal requests (10.1%) topped the list for elective caesarean sections.[23]

A study in a northern Namibia hospital revealed dystocia (34%) followed by repeat caesarean section (31%) as the main indications for caesarean sections.[24] The most frequent reason for caesarean section for instance as shown in a study in a Nigerian tertiary institution was repeated or previous caesarean section (21.5%) followed by cephalopelvic disproportion (CPD) (20.2%) and fetal distress (19.2%).[25]

The above stated indications contrast with that of Schweis [26]who showed that fetal distress, breech presentation, history of previous caesarean section and dystocia were the main indications for caesarean section. At Jimma Hospital, south-western Ethiopia, the main indications for caesarean

section were labour obstruction (65%) comprising of cephalopelvic disproportion (44%), malpresentations and malpositions (21%), repeat caesarean section(16%), antepartum haemorrhage (8%) and fetal distress (6%) thus representing 95 % of all the indications for caesarean section.[27]

In recent times, caesarean section has been carried out based on maternal request with a belief that normal delivery could cause pelvic/genital organ prolapse, stress urinary incontinence, labour pain and fetal distress during labour.[28] However, a study in North Carolina revealed that since the majority of women prefer normal delivery, caesarean delivery on maternal request (CDMR) contributes little to the upsurge in the caesarean delivery rate.[29] Misleading information garnered and fears related to vaginal delivery are factors determining women's preference for caesarean delivery.[29]

There is upsurge in the rate of caesarean section worldwide.[30] A significant increase of 11% in a 12-year period (1982 through 1994), almost an annual increase of 1% has been found globally.[31]An increase in caesarean section rate was recorded in Australia rising from 17% in 1990 to 23% in 2000.[33] In United State of America, a decline in caesarean section rate from 1991 to 1996 was recorded followed by an increase reaching its highest point of 31.1% in 2006. From 2008 onward, the caesarean section rate started to dwindle.[33]

In Europe, a rise in births by caesarean section from 172,.49 per 1000 live births in 1997 to 253.23 per 1000 live births in 2010 was recorded.[33,34,35]. A similar upsurge in the percentage of deliveries by caesarean section was noted between 1991 (15.3%) and 2012 (31.7%) in Germany. However, a slight fall by 0.4% occurred in 2012 when compared to 2011 in this European country.[33,35]A study in Iran conducted in 2008 revealed 60% caesarean sections in public hospitals copmpred to 10% in private hospitals.[36].

Fewer data are available on trends in caesarean section rates in sub-Saharan Africa. In South Africa, in 2008/2009, the average caesarean section rate in district hospitals was 16.1% and ranges from a high of 32.5% in Nelson Mandela Bay Metro to a low of 3,2% in Frances Baard.[37]. Caesarean section rates in a Tanzanian referral hospital between 2005 and 2010 ranged from 29.9 % to 35.5%.[38] Caesarean section rates of 5.7%, 4.3% and 6.0% were recorded in Katima Mulilo State Hospital in 2010, 2011 and 2012 respectively. Caesarean section rate of 5-15% corresponds to the optimal range according to World Health Organization (WHO) but however, a lower rate is found in resource-poor countries of about 1-2% in sub-Saharan Africa due to limited access to this procedure.[39]

## AIMS

To determine the sub-types of obstructive labour, as well as other indications for operative delivery at Katima Mulilo state hospital, Zambezi region, Namibia.

## OBJECTIVES

To describe the various types of surgical interventions instituted for the obstructed labour cases.
To demonstrate at what stages of labour, obstruction occurred and the responsible modifiable and unmodifiable factors.
To analyze the various factors contributing to operative deliveries in Katima Mulilo State Hospital.

## METHODS

### Study design

The study used a descriptive cross sectional survey.

### Data collection

This was done with the aid of a designed instrument to ensure consistent data collection/capturing from data sources. The tool used was a 'Data Extraction Form' which had been piloted before formal use. The available records from the surgical theatre and labour/maternity ward and records department of Katima Mulilo hospital were made use of and scrutinized well to eliminate all forms of data errors. The records were those of the pregnant patients who underwent surgical interventions like caesarean section or ventouse delivery for the delivery of their babies during the specified period.

The patient's age, parity, gravidarity, maternal mortality and morbidity, educational level, marital status, systemic diseases, gestational age the surgery was performed, indication(s) for operative delivery, postoperative care and other factors contributing to operative delivery were recorded.

Also captured on the data extraction form were the history of previous operative deliveries, type of previous and present operative deliveries, indication(s) for previous operative delivery, stage of labour where the operative delivery was performed, contraindication(s) to the operative delivery, type of anaesthesia used for the procedure, the duration of labour before intervention, outcome of the procedure, recourse to any other procedure after a failed one, the date the procedure was performed and neonatal birthweight.

### Study Setting

This study took place in Katima Mulilo State Hospital, Katima Mulilo, Zambezi region, Namibia. Katima Mulilo District hospital is a 182 bed hospital serving as a referral centre to 28 health facilities which comprises of 3 health centres and 25 clinics. In essence, this referral centre functions more or less like an intermediate hospital found in other regions of Namibia. This district hospital serves a population of about 100,000 people living in Zambezi Region. Surgery is performed by medical officers. Katima Mulilo is the only town in the region while the others are villages.

### Study population

The study population comprised of pregnant patients as from 1st January to 31st December 2011 who had surgical interventions done for the delivery of their babies.
Pregnant women of all ages who had operative deliveries of various types from various indications as seen from 1$^{st}$January to 31$^{st}$December 2011 in this hospital was considered and analysis made to determine those who had obstructed labour. No exclusion criteria were used.

### Ethics

Approval was sought from Namibia Ministry of Health and Social Services (MOHSS) Ethical Committee and Human Research and Ethics Committee (HREC) of the Stellenbosch University. Approval was granted by both Authorities with Ethics reference number S14/03/058 from Stellenbosch University HREC.

### Data analysis

A consultant statistician from the Centre for Statistical Consultation, Stellenbosch University, was of great assistance in data analysis using the statistical programme SPSS. Analysis of the data entailed the use of descriptive statistics which included the use of frequencies, percentages and means. Statistical significance was conventionally set at $p<0.05$.

## RESULTS

Of the total 117 cases studied, 6 patients had incomplete available data. As a result, not all the parameters like gravidarity, parity, educational level attained to name a few could be obtained from these 6 patients' records. This is reflected in the variation in the number of cases appearing in the various graphs below.

**Table 1.** The indications (post- operative diagnosis) for operative delivery occurring alone or with others in Katima Mulilo Hospital, January-Dec 2011.

| Serial number. | The Indications for Operative procedure. | Frequency of occurrence (Number of cases). |
|---|---|---|
| **1** | Delayed First Stage | 9 |
| **2** | Delayed Second Stage | 7 |
| **3** | Postmaturity with Failed Induction | 2 |
| **4** | Abnormal Presentation | 17 |
| **5** | Cephalopelvic Disproportion (CPD) | 19 |
| **6** | Abnormal lie | 4 |
| **7** | Preeclampsia | 17 |
| **8** | Eclampsia | 4 |
| **9** | Previous caesarean section. | 12 |
| **10** | Fetal Malpositioning | 1 |
| **11** | Breech in Primigravida | 5 |
| **12** | Fetal distress | 19 |
| **13** | Cord Prolapse. | 4 |
| **14** | Elderly Primigravidarity | 3 |
| **15** | Elective caesarean section | 1 |
| **16** | Antepartum haemorrhage (APH) | 2 |
| **17** | Premature rupture of membrane (PROM) in retroviral disease (RVD). | 2 |
| **18** | Florid Genital Warts. | 2 |
| **19** | Cervical dystocia | 2 |
| **20** | Fetal Macrosomia | 3 |

From Table 1, cephalopelvic disproportion and fetal distress had the highest frequency of 19 (14.1%) followed by abnormal presentation 17 (12.6%), pre-eclampsia 17 (12.6%), and previous caesarean section 12 (8.9%).

Analysis of the postoperative diagnosis, Table 2, shows 67 (57.3%) cases for obstructed labour, 19 (16.2%) cases for fetal distress, 17 (14.5%) for pre-eclampsia, 12(10.3%) for previous caesarean section, 2 (1.7%) for each of antepartum haemorrhage (APH), premature rupture of membrane (PROM) in RVD, florid genital warts and post-maturity with failed induction. Cord prolapse occurred in 4 (3.4%) of cases, elderly primigravidarity in 3 (2.6%) of cases and elective caesarean section 1(0.9%) of cases.

**Table 2.** Summary of the indications for operative delivery (post-operative diagnosis) as seen in Katima Mulilo Hospital, January-December, 2011.

| Indications | Frequency of occurrence | Percentage % |
|---|---|---|
| Obstructed labour | 67 | 57.3 |
| Postmaturity with failed induction | 2 | 1.7 |
| Pre-eclampsia | 17 | 14.5 |
| Eclampsia | 4 | 3.4 |
| Previous caesarean section | 12 | 10.3 |
| Elderly primigravidarity | 3 | 2.6 |
| Elective caesarean section | 1 | 0.9 |
| Antepartum haemorrhage | 2 | 1.7 |
| Premature rupture of membrane in Retroviral disease | 2 | 1.7 |
| Florid genital warts | 2 | 1.7 |
| Cord prolapse | 4 | 3.4 |
| Fetal distress | 19 | 16.2 |
| **Total** | 135 | |

Of the faktors associated with labour shown in Table 3, cephalopelvic disproportion (CPD) accounted for 19 (28.4%) followed by abnormal presentation 17 (25.4%) and delayed first stage 9(13.4%). Fetal malpositioning had the lowest proportion of 1(1.5%).

**Table 3.** Obstructed labour factors as seen in Katima Mulilo Hospital, January to December,2011.

| Factors | Frequency of occurrence | Percentage % |
|---|---|---|
| Delayed first stage | 9 | 13.4 |
| Delayed second stage | 7 | 10.4 |
| Abnormal presentation | 17 | 25.4 |
| Cephalopelvic disproportion(CPD) | 19 | 28.4 |
| Abnormal lie | 4 | 6.0 |
| Fetal malpositioning | 1 | 1.5 |
| Breech in primigravida | 5 | 7.5 |
| Cervical dystocia | 2 | 3.0 |
| Fetal macrosomia | 3 | 4.5 |
| **Total** | 67 | 100 |

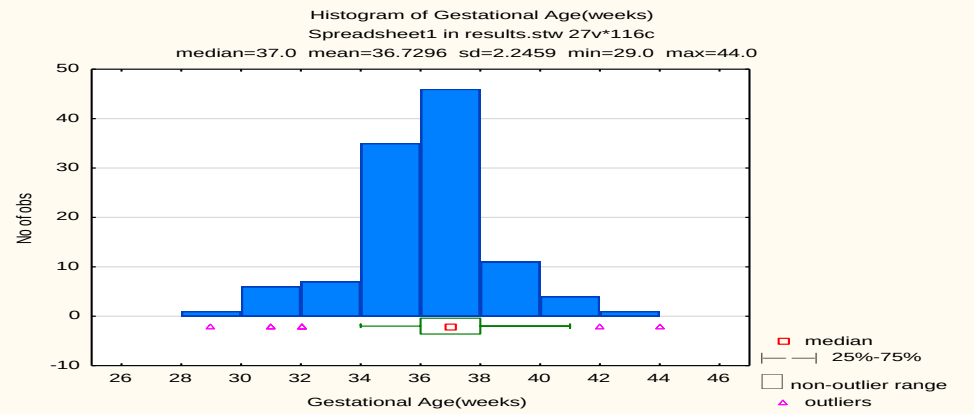
Out of the total 117 patients that had surgery in 2011 as shown in Table 4, 116 (99.2%) patients underwent caesarean section and only I (0.9%) patient had vacuum extraction done on an account of labour obstruction. No patient had forceps delivery.

**Table 4.** Types of operative deliveries employed in Katima Mulilo Hospital, January-December, 2011.

| Serial number | Surgical procedure type | Frequency | Percentage (%) |
|---|---|---|---|
| **1** | Vacuum extraction | 1 | 0.85 |
| **2** | Caesarean section | 116 | 99.15 |
| **3** | Forceps delivery | 0 | 0 |
| **4** | Number of cases | 117 | 100 |

The mean maternal age was 25.5 while the mean gestational age was 36.7 weeks (Figure 1) and the mean gravidarity was 2.0. A total of 67% of the women are literate while 33% are illiterate. A total of 51% of the women were single while 49% were married. This shows a slight preponderance of single women in the study. A total of 34 % of the women suffered from retroviral disease (RVD), 3% hypertension (HPT) while 64% had no systemic disease. All the surgical procedures were successfully carried out.

**Figure 1.** Gestational Age (weeks).

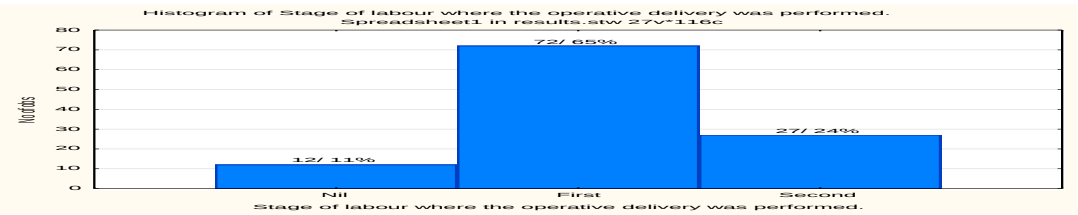



For the operative delivery from the study, no recourse to any other procedure after a failed one was recorded. Mortality following the operative delivery as illustrated above shows 2 (2%) stillbirths, 2 (2%) neonatal deaths and 4 (4%) fresh stillbirths. Most of the subjects, 98%, suffered no morbidity as a consequence of the procedures.

A total of 96 (86%) patients had no history of previous operative delivery as against 15 (14%) patients with such history. Cephalopelvic disproportion followed by fetal distress, were found as the main indications for previous operative deliveries. Caesarean section was the only operative intervention undergone by a few who had history of previous operative delivery in the study. A total of 79% of patients had spinal anaesthesia while 19% had general anaesthesia. In 2% of cases, the anaesthesia type was not stated.

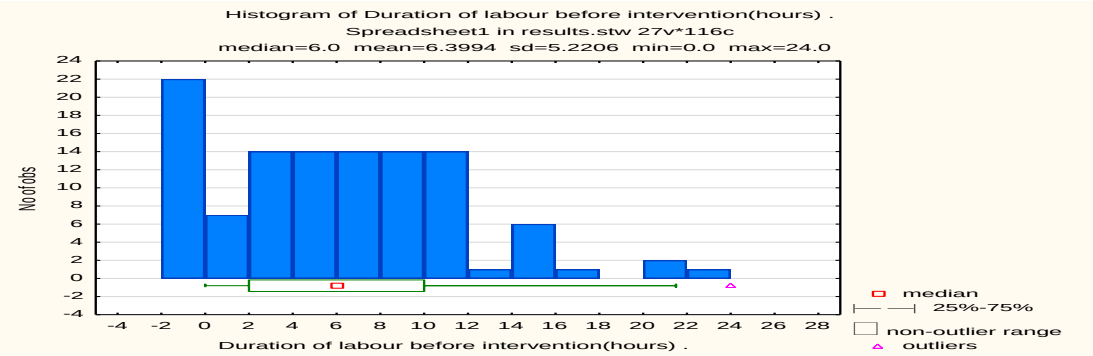
Emergency caesarean section was carried out in 98% of cases, elective caesarean section in 1%, and vacuum extraction also in 1% of cases. Operative delivery was performed at first stage of labour in 65% (75) of cases, 24% (27) at second stage and in 11% (12) of cases, the patients were not in labour (Figure 2).

**Figure 2.** Stage of labour where the operative delivery was performed.



The mean neonatal birthweight was 3.1Kg, while the mean duration of labour before intervention was 6.3 hours (Figure 3).

**Figure 3.** Duration of labour before intervention (hours).




## DISCUSSIONS

The study looked at obstructed labour as an indication of operative delivery. Forms of labour obstruction, the stages of labour within which they were encountered and the surgical interventions instituted were demonstrated by the study.

The mean maternal age 25.5 years and age range 20-25 years from the study contrast with the findings of Kabakyenga and Ostergren et al in another study in south-western Uganda where the mean maternal age and the age range were 17 years and 15-19 years respectively.[1] However, from the study, a significant proportion of the patients belonged to the age range 15-20.

The mean gestational age in weeks from the study was 36.7 meaning delivery occurred in most cases at or near term. Furthermore, a large number of the patients in this study were literate. Jurdi and Khawaja in a study on caesarean rates in the Arab region observed highly significant associations between population caesarean rates and female literacy.[40] The Arab countries with high female literacy level were found to have high caesarean section rates due to high maternal requests.

Analysis of postoperative diagnosis showed obstructed labour followed by fetal distress and pre-eclampsia as the leading indications for operative delivery and hence caesarean section. Similarities were seen with the findings in a Saudi Arabian hospital where obstructed labour topped the list of the indications for caesarean section followed by fetal distress.[23]This contrasts with the findings of Ajuzieogwu and Amucheazi at a Nigerian Tertiary Institution where previous caesarean section[41] followed by cephalopelvic disproportion (CPD) were the main indications for caesarean section.[25]

Of the factors associated with obstructed labour in this study, cephalopelvic disproportion has the highest contribution followed by abnormal presentation and delayed first stage. The factor least encountered was fetal malpositioning. Interestingly, these findings at Katima Mulilo hospital, northeastern Namibia, where cephalopelvic disproportion was the leading indication of operative delivery contrast with those in a semi-rural hospital in northern Namibia where cervical dystocia followed by a repeat caesarean section as earlier discussed were the main indications for caesarean section[24] but in agreement with the finding of Kabakyenga and Ostergren et al in south-western Uganda.[1] Based on the fact that the weight in kilogram of 79 (68%) fetuses from the study were in the range of 2.5-3.5 kilogram, contracted pelvis other than macrosomia was the reason for cephalopelvic disproportion. This is comparable to the findings of Shimeli and Hailemariam et al in a study on obstructed labour in Jima University Hospital where the birthweight of most of the fetuses

was in the range of 2.5-3.9 kilogram and a similar reason as above adduced for CPD which was also the leading cause of obstructed labour in this hospital.[9]

The systemic disease suffered most by the patients from the study is retroviral disease. Retroviral disease could impart directly on operative delivery especially when it is accompanied with premature rupture of membrane (PROM) which has lasted more than 4 hours in duration or when there is high viral load.[22]

Post-operative mortality from the study manifested as 2 stillbirths the cause of which is unknown and could be thought of to have arisen as a sequelae of the primary caesarean section undergone as increased rate of stillbirth was found in women with primary caesarean section according to O'Neill and Agerbo et.al.[42]

Most of the operative procedures for labour obstruction, from the study, were carried out as an emergency (65%) in the first stage of labour. This contrasts with the finding of a team of health experts who reported in Health Education and Training (HEAT) Program module on Labour and Delivery Care in Ethiopia that obstructed labour most commonly develops after labour has entered into the second stage.[43]

From the study, caesarean section was the main operative procedure employed in nearly all the cases, 98% as emergency. Ventouse was only used in a case. This finding reinforces the assertion that caesarean section is the commonest operative delivery method in use globally and that vacuum extraction is rarely or minimally used. The finding is also in agreement with the results of the studies carried out by Kozhimannil and Arcaya et al in United State of America (USA)[44] and Opoku at Komfo Anokye Teaching Hospital, Ghana.[45] Nevertheless, in USA, there has been a progressive shift away from the use of forceps in favour of vacuum extractor the past 20 years as an indication that forceps delivery is becoming obsolete, an argument supported by a finding of Ali and Norwitz.[46]

Elective caesarean section was carried out in 1% of the cases. There was no clarity from the records whether this was based on patient's demand or otherwise. The result shows that the incidence of elective caesarean section in Katima Mulilo Hospital and Zambezi Region is low as opposed to increasing incidence due to high maternal request[47,48] without a medical indication. From the study, 14% of the pregnant women had history of previous operative delivery only by way of caesarean section. Postoperative diagnosis which gave more reliable indications than those arrived at preoperatively were relied upon in the study.

Perinatal mortality from the procedure is expressed in terms of neonatal deaths which occurred in 2% of all cases accounting for 28.6% of perinatal mortality cases, fresh stillbirth (FSB) seen in 4% of all cases and responsible for 57.14% of perinatal mortality cases, stillbirth encountered in 1% of the studied population constituting 14% of perinatal mortality cases.

The high perinatal death could have arisen from patients from rural areas with no antenatal care (ANC) follow up. This indicates a significant delay in healthcare seeking behaviour or a delay in accessing health facility from the beginning of the pregnancy. This could also be due to delay in providing appropriate intervention during the early stages of pregnancy. The latter reason is buttressed by the fact that on one occasion according to the record from the study, the duration of labour before intervention was 21.5 hours which resulted in a stillbirth.

The perinatal death recorded could have arisen from patients who defaulted antenatal care (ANC) follow up. This may indicate a significant delay in healthcare seeking behavior or a delay in accessing health facility from the beginning of the pregnancy. This could also be due to delay in providing

appropriate intervention during the early stages of pregnancy. The latter reason is buttressed by the fact that on one occasion according to the record from the study, the duration of labour before intervention in terms of caesarean section was 21.5 hours which resulted in a stillbirth.

The causes of neonatal death from the study have been attributed to previous caesarean section and eclampsia while for 2 fresh stillbirths recorded, labour obstruction was implicated. Cord prolapse was implicated in a fresh stillbirth case while fetal distress was implicated in another. Stillbirth has been found to be the sole sequela of obstructed labour in this study. However unexplained asphyxia, obstetric complications like obstructed/prolonged labour, maternal disease like preeclampsia/eclampsia, unexplained antepartum stillbirths after 37 weeks of gestation, and unexplained antepartum stillbirths before 37 weeks of gestation are the major factors associated with perinatal mortality.[49]

## CONCLUSION

The study has revealed a high frequency of obstructed labour occurring predominantly in the first stage of labour and cephalopelvic disproportion was found to be the main determinant of labour obstruction. Abnormal presentation, abnormal lie, fetal malpositioning, cephalopelvic disproportion, breech in primigravida, cervical dystocia, fetal macrosomia, delayed first and second stages of labour were found to be the main reasons for obstructed labour at Katima Mulilo hospital. Emergency caesarean section was the operative procedure employed uneventfully in almost all the cases. Previous caesarean section and teenage pregnancy have been found to have contributed to operative delivery.

## LIMITATIONS OF THE STUDY

- Some patients' files could not be traced in the records department of the hospital and as a result, incomplete data on patients' parameters like parity, gravidarity, educational level, marital status, systemic diseases, neonatal birthweight, previous operative delivery, stage of labour where the operative delivery was performed among others were recorded on the data collection sheet.
- There is incomplete data on the gestational age (GA) of stillbirth. Lack of data on antepartum/ intrapartum stillbirth was noticed and the causes of stillbirth were unfortunately not documented in the records.
- Data on maternally requested caesarean section was incomplete.

## RECOMMENDATIONS

- Early identification of mothers at risk of pregnancy complications through antenatal care screening should be embarked upon.
- Teaching pregnant women to recognize signs of pregnancy complications, timely access to obstetric care, monitoring of labour for fetal distress, and proper newborn resuscitation techniques may reduce some of the categories of deaths.
- Malpositioning, inadequate pelvis and inadequate uterine contraction which are some of the predictors of specific types of labour abnormalities like prolonged latent stage, active first stage disorder, prolonged second stage, descent disorder and obstructed labour should be sought for, identified and addressed urgently.
- Patients should not be late in presenting to the hospital.
- Evidenced-based guidelines/policies to address teenage pregnancy, contraception use, and maternal malnutrition may assist in minimizing morbidity and mortality burden of labour obstruction.

- The study findings will be communicated with stakeholders (clinicians, managers, policy writers) and the community served by this district hospital.

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