

**Fetal and Maternal outcomes of mothers presenting
with Obstructed labour at Provincial General Hospital
Kakamega**

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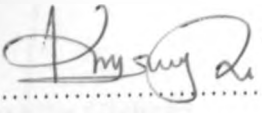
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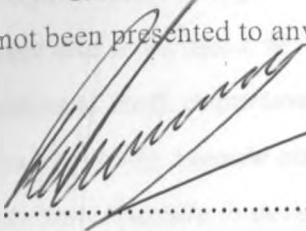
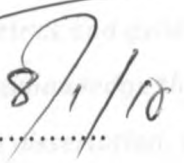
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DEDICATIONS

This work is dedicated to my loving wife Consulate Akinyi for her dedicated support through my course. It is also dedicated to my awesome children Mercy, Eric, Austin and Martha, who have given me reason to work hard everyday.

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LIST OF ABBREVIATIONS

- ANC - Antenatal clinic
CPD - Cephalopelvic disproportion
D.H. - District Hospital
DVT - Deep venous thrombosis
EMCS - Emergency cesarean section
FSB - Fresh still birth
H.C. - Health Centre
ICU – Intensive care unit
IUFD - Intrauterine fetal death
KNH – Kenyatta National Hospital
LSCS - Lower segment cesarean section
MTC - Medical Training College
MSB - Macerated still birth
NBU – New born Unit
POPP - Persistent Occipital Posterior Position
PGH - Provincial General Hospital
PPH - Post partum hemorrhage
SVD - Spontaneous vertex delivery
VVF - Vesical vaginal fistula
WHO - World Health Organisation

ABSTRACT

Objective; To determine the Maternal and Fetal outcomes in terms of Maternal and Fetal morbidity and mortality in mothers presenting with obstructed labour compared to other parturients undergoing emergency caesarian section at PGH Kakamega.

Rationale; Obstructed labour is a major cause of maternal and perinatal morbidity and mortality accounting for an estimated 8% of maternal deaths [4].

This is an entirely preventable labour complication with improvement in comprehensive antenatal care, good and timely referral system and timely intervention (4)

There is limited data on studies in our set up that have been objectively done to determine the maternal and fetal outcomes of mothers with obstructed labour.

Methodology; This was hospital based prospective cohort study .The study area was PGH Kakamega Obstetric unit. The study was conducted between August 2008 and January 2009. The study group comprised of 135 mothers with obstructed labour while the comparison group also comprised of 135 mothers. Data collected was analyzed in SPSS version 15.0. Data analysis entailed the use of descriptive statistics such as frequency distributions and cross tabulations using the chi-square statistics.

Results; The study found that the prevalence of obstructed labour was 6.8%. Women with obstructed labour had low educational and socioeconomic status compared to the comparison group (p 0.032, 0.05). While 90% of mothers with obstructed labour had attended antenatal clinic only 49% had intended to deliver in hospital. Factors that contributed to the delay in presenting to hospital included; lack of funds (27%), husband or mother in-law refusal to give consent for hospital delivery (26%), lack of transport or ambulance at the primary and secondary level facility (17%). Obstructed labour was associated with significant maternal morbidities; ruptured uterus 6%, obstetric hysterectomy 5.2 % (p 0, 0015), uterine tears 14.8% (p 0.000), postpartum hemorrhage 14.9% (p 0.000), wound sepsis 43% (p 0.0001) and puerperal sepsis 26.7% (0.000).

Obstructed labour was also associated with significant fetal mortality and morbidities; stillborns 18.5% (p 0.0001), low Apgar score 30%, newborn unit admission 26.6% (p 0.0001) and neonatal sepsis 16.5% (p 0.0001).

Conclusion; There is need to improve the educational and socio-economic status of the women. Restructuring of M.C.H. Services should be done with particular attention to increasing community awareness on safe obstetric care, quality health talks to our antenatal clients on safe obstetric care, establishing a streamlined and effective referral system at the primary and secondary health care facilities and partnership with the community on the importance of safe obstetric care.

INTRODUCTION

Even in the 21st century, obstructed labour still remains a life-threatening catastrophe all over the world but mostly in the developing countries. This entirely preventable labour complication carrying a very high maternal and neonatal morbidity and mortality is an indicator of the inadequacy and poor quality of obstetric care (1). Obstructed labour is one where in spite of good uterine contractions; the progressive descent of the presenting part is arrested due to mechanical obstruction (4).

Perhaps the most famous account of obstructed labor is the case of Princess Charlotte of England who died after delivering a 9-pound stillborn baby following 50 hours of labor. Three months later Sir Richard Crofts, the Princess's obstetrician, unable to bear the responsibility of the death of the heir to the British throne committed suicide. This has historically been referred to as "The Triple Obstetric Tragedy". It illustrates the grave consequences of obstructed labor involving the infant, the mother and the doctor (1). Fortunately, advances in obstetric care have made obstructed labor nearly obsolete in the developed world. However, this problem continues to plague thousands of women each year accounting for about 8% of all maternal deaths in developing countries (2). Estimating the global dimensions of mortality and morbidity due to obstructed labour is difficult because of the absence of a clear definition and confusion of terms used by different practitioners. The management of such cases where the fetus is either dead or having severe fetal distress and the mother is severely dehydrated with features of ascending infection requires a balanced decision by the obstetrician regarding the best method of relieving the obstruction with least hazard to the mother.

Prior to the advent of antibiotics and their rapid evolution, the popular method was to reduce the bulk of the fetal head or trunk by destructive operations to allow its extraction through the birth canal. These procedures had very high mortality and morbidity. In the modern era, lower segment cesarean section (LSCS) under good antibiotic coverage has a very low mortality and morbidity and seems to be the best option (2). Kakamega PGH is a Referral Hospital for Western province; it receives

referrals from health centres and traditional birth attendants who most often have been mismanaged and with intrapartum complications including obstructed labour.

No objective studies had been done to look at the pregnancy outcome among mothers presenting with obstructed labour in PGH Kakamega and even the National referral hospital [KNH]. This study intended to look at the prevalence of obstructed labour, the maternal and perinatal outcomes of mothers that presented with obstructed labour and compare these outcomes with mothers who presented to the same unit and underwent emergency cesarean section for fetal or maternal indication.

BACKGROUND / LITERATURE REVIEW

WHO has estimated that approximately 40,000 women die each year as a result of obstructed labour, and an additional 73,000 suffer from the persistent and devastating consequence of obstetric fistula (9). Worldwide, obstructed labor occurs in an estimated 5% of pregnancies and accounts for an estimated 8% of maternal deaths (11, 13,14).

Some 8% of all maternal deaths in developing countries are due to obstructed labour .

This figure is an underestimation of the problem, because deaths due to obstructed labour are often classified under other complications associated with obstructed labour (such as sepsis, postpartum haemorrhage or ruptured uterus)(2). It is a major cause of perinatal mortality, accounting for 100-180 deaths/1000 live births (15-18). In Bangladesh, for example, obstructed labor was found to be the third most common cause of maternal mortality in one study (19) and the most important cause of mortality in another (11). In addition to its effects on maternal mortality, obstructed labor can be a significant contributor to infant perinatal morbidity and mortality (15).

Delayed management of obstructed labour causes obstetric fistula in surviving women, which if not treated, may make them outcasts from their community for the rest of their lives. Obstructed labour also causes significant maternal morbidity in the short term (notably infection) and long term (notably obstetric fistulas)(16). Fetal death from asphyxia is also common. There are differences in the behaviour of the uterus during

obstructed labour, depending on whether the woman has delivered previously. The pattern in primigravid women (typically diminishing contractility with risk of infection and fistula) may result from tissue acidosis, whereas in parous women, contractility may be maintained with the risk of uterine rupture (16). Perinatal mortality is an important indicator of obstetric care, health status and socio-economic development.

Perinatal mortality rates are highest in developing countries, particularly in Africa. In 1995, WHO estimated a perinatal mortality rate of 75 per 1000 births in Africa, a modest decline from the rate of 81 per 1000 births in 1983 and substantially higher than in more-developed countries, where the estimated rate was 11 per 1000 births (12). Kavoo-Linge & Rogo identified prolonged labour/obstructed labour as a particularly important factor for perinatal deaths occurring within the first 24 h after hospital delivery in Kenya, while labour complications were associated with perinatal death in almost 40% of deliveries in another rural district hospital in Kenya. (20,1).

The approach to improving maternal and perinatal health in developing countries has shifted to safe motherhood programmes that focus on improving care during labour including strengthening emergency obstetric services. Having a health worker with midwifery skills present at delivery is now seen as one of the most critical interventions for making motherhood safer [5].

Kenya has made great progress in addressing maternal health and with the inauguration of Safe Motherhood Initiative in Nairobi in 1987 specific programmes to reduce maternal mortality and improve maternal health were established. These developments have been made against a backdrop of demographic milestones such as the increase in population from 9 million in 1969 to 31.5 million in 2002. Of significance is the fact that 43% of this population is below 15 years of age. Equally a significant number of young women enter childbearing and this is evidenced by the data from the KDHS 1993 and 1998 where 44% and 55% of girls aged 19 years respectively had already began childbearing. Maternal mortality ratio has increased from 365/100,000 live births in 1993 to 590/100,000 in

1998 and 414/100,000 in 2003. About 90% of pregnant women in Kenya are seen by professional health providers at least once through Antenatal Care clinics but only half of them receive professional skilled attendance at birth, the majority delivering at home under unskilled attendance, usually the TBA (23).

In a study, Labour complication in rural Kenya in Kilifi, Obstructed or prolonged labour was the most commonly noted labour complication (8.5%) (5).

The prevalence of obstructed labour in Aminu Kalo Teaching Hospital in Nigeria was 8.5%. Highest among unbooked primigravid teenages.

Commonest cause was cephalopelvic disproportion 75%, Perinatal mortality rate was 52%, 39% presented with intrauterine fetal death and maternal mortality was 1%(6).

At University Teaching Hospital Nigeria, Incidence of 2.6%. 33% of patients were nulliparous and 51% unbooked. Cephalopelvic disproportion commonest cause 64% , wound infection 33% and puerperal sepsis 27%(7).

In a five year retrospective study on obstructed labour in the Medical College & Hospitals, Calcutta by S Adhikari¹ found Perinatal mortality was 12.90%. At birth, 28.57% babies were severely depressed. 8.57% of the live born babies continued with poor apgar scores at 5 minutes. Maternal mortality was 2.04%(2).

Adolescent women are particularly susceptible to obstructed labor, because their pelvis are not yet fully developed. Women who suffer from malnutrition could also be at particular risk because the body's growth may have been stunted in childhood.

Studies looking at the maternal and fetal outcomes among mothers undergoing emergency cesarean section have yielded varying results with the maternal mortality of 0.003% and perinatal deaths 30-50 / 1000 live births (12, 26).

Obstructed labour

Obstructed labour means that, in spite of strong contractions of the uterus, the fetus cannot descend through the pelvis because there is an insurmountable barrier preventing its descent. Obstruction usually occurs at the pelvic brim, but occasionally it may occur in the cavity or at the outlet of the pelvis.

Complications resulting from obstructed labour can be avoided if a woman in obstructed labour is identified early and appropriate action is taken (4).

Causes of Obstructed labour:

1. Cephalopelvic disproportion (small pelvis or large fetus)
2. Abnormal presentations, e.g.
 - brow
 - shoulder
 - face with chin posterior, after coming head in breech presentation
3. Fetal abnormalities, e.g.
 - hydrocephalus
 - locked twins
4. Abnormalities of the reproductive tract, e.g.
 - pelvic tumour
 - stenosis of cervix or vagina
 - tight perineum.
5. Rarer causes.

This may be associated with scarring caused by female genital mutilation (26).

WHAT HAPPENS IN OBSTRUCTED LABOUR?

Premature rupture of membranes;

When the head is arrested at the pelvic inlet, the entire force exerted by the uterus is directed on the portion of membranes in contact with the internal os. Consequently early rupture of membranes is likely (26).

Abnormalities in dilatation of the cervix;

The cervix dilates slowly or not at all, because the fetal head cannot descend and put pressure on it. At the same time the cervix may become edematous.

The first stage of labour is therefore prolonged. (However, the first stage may be normal or short if, for example, obstruction occurs only at the outlet. In this case only the second stage will be prolonged). Prolonged labour causes the mother to become ketoacidotic and dehydrated. An undilating cervix means that a caesarean will be necessary. On the other hand, if the cervix is dilating normally, this usually indicates that the obstruction has been overcome by labour and that vaginal delivery may be possible (26).

Danger of uterine rupture;

When the membranes rupture and the amniotic fluid drains away, the fetus is forced into the lower segment of the uterus by contractions. If the contractions continue, the lower segment stretches, becomes dangerously thin and is likely to rupture. However, uterine exhaustion may occur before that point is reached, causing contractions to become weaker or cease altogether and making the occurrence of uterine rupture less likely (26).

Rupture of the uterus may be complete or incomplete. If it is complete (i.e. the uterus communicates directly with the peritoneal cavity), bleeding will occur within the peritoneum. If it is incomplete (i.e. the rupture does not reach the visceral peritoneum), bleeding will occur behind the visceral peritoneum. Rupture of the uterus is more likely to occur in multipara (it is very rare in nullipara), especially if the uterus is already weakened by the scar of a previous caesarean section (26).

Rupture of the uterus causes haemorrhage and shock. Without treatment it is fatal.

Ndede (1990) review of rupture of the uterus in KNH found that spontaneous rupture of uterus due to obstructed labour accounted for 81% of the uterine ruptures (10).

Obstetric fistulas ;

Approximately 80 000 women develop obstetric fistula each year. It is a vesicovaginal or rectovaginal fistula resulting from pressure necrosis from the fetal head on vagina and bladder or rectum tissues during prolonged and obstructed labour [8,21]. When the fetal head is stuck in the pelvis for a long time, portions of the bladder, cervix, vagina and rectum are trapped between the fetal head and the pelvic bones and are subjected

to excessive pressure. Because the circulation is impaired, oxygenation of these tissues is inadequate and necrosis occurs, followed in a few days by the formation of a fistula. The fistulae could be vesico-vaginal (between the bladder and the vagina), vesico-cervical (between the bladder and the cervix) or recto-vaginal (between the rectum and the vagina) and allow leakage of urine or faeces from the vagina. They are most common in nullipara, especially in countries where childbearing starts at an early age. Obstructed labor is the immediate cause of obstetric fistula, is one of the leading causes of maternal illness and death in sub-Saharan Africa and South Asia(12). In a study by Mabeya on VVF in Rural District in Kenya, obstructed labour was the major cause of obstructed labour with > 90% being under 20 years(22).

Puerperal sepsis;

Infection is another serious danger for the mother and fetus in cases of prolonged and obstructed labour, especially as membranes are likely to rupture early. The danger of infection is increased by repeated vaginal examinations (26).

Changes in skull and scalp on the fetus;

Due to pressure from the Pelvic bones as the head passes through the birth canal, the flexible bones of the skull overlap and moulding occurs. This changes the shape of the head and facilitates the baby's passage through the birth canal. In addition, swelling of the scalp may also occur forming what is called a caput succedaneum. This is normal and within a few days the moulding of the scalp will return to normal position and the swelling will subside. However, excessive moulding can lead to tears in the meninges, resulting in intracerebral haemorrhage and possible fetal death (26).

Fetal death:

If obstructed labour is allowed to continue for a long time, the fetus dies because of anoxia caused by excessive pressure on the placenta and umbilical cord. The dead fetus becomes softened by decay and may trigger the onset of coagulation failure. This leads to maternal haemorrhage at delivery, shock and the risk of death (4).

Diagnostic criteria for obstructed labour

1. Rising retraction ring is seen and felt as an oblique groove across the abdomen-band's ring.
2. Vulva is oedematous.
3. Vagina is dry and hot.
4. Cervix: is fully or partially dilated, edematous.
5. The presenting part: is high and not engaged or impacted in the pelvis.
6. Excessive moulding grade 3 and large caput succedaneum.

During this study any patients who presented with one or more of the above formed the basis of diagnosis of obstructed labour (26).

RATIONALE

Obstructed labour is a major cause of maternal and perinatal morbidity and mortality accounting for an estimated 8% of maternal deaths (4). It is a major cause of obstetric fistula (11).

This is an entirely preventable labour complication with improvement in comprehensive antenatal care, health system/community partnership, timely referral system and timely intervention (4).

There is limited data on studies in our set up that have been objectively done to determine the maternal and fetal outcomes of mothers with obstructed labour.

This lack of empirical research is a limiting factor in the formulation specific policy interventions that can be designed to address obstructed labour despite the fact that this is an otherwise entirely a preventable medical condition (4, 12).

This study intended to find out the magnitude of obstructed labour, the fetal and maternal outcomes, factors that contribute to the delay in presenting to health facility among mothers presenting with obstructed labour at PGH Kakamega which mainly serves Western province and its environment and compare this outcomes with those of mothers who had an emergency cesarean section in the same unit for fetal or maternal indication.

The results from this study are intended to be used to guide the site specific and general policy interventions designed to address obstructed labour tragedy.

BROAD OBJECTIVE

To determine the Maternal and Fetal outcomes in terms of Maternal and Fetal morbidity and mortality in mothers presenting with obstructed labour compared to other parturients undergoing emergency caesarian section at PGH Kakamega.

SPECIFIC OBJECTIVES

1. To determine the prevalence of obstructed labour at PGH Kakamega.
2. To determine the Socio-demographic characteristics of the mothers presenting with obstructed labour and the comparison group
3. To determine the duration of labour and its relation to the fetal maternal outcomes among mothers in both groups
4. To determine and compare the maternal outcomes in the two groups.
5. To determine and compare the fetal outcomes in the two groups.

HYPOTHESIS

Obstructed labour is associated with adverse maternal and fetal outcomes.

METHODOLOGY

STUDY DESIGN

This was a prospective cohort study. Mothers diagnosed with obstructed labour were assigned to the study group while the comparison group comprised consenting mothers admitted in the unit in labour without features of obstructed labour but with a maternal or fetal indication that necessitated an emergency caesarian section to be performed.

These mothers were recruited at admission in labour ward and followed up through to the postnatal ward till discharge from hospital and their maternal and fetal outcomes were determined and analyzed.

STUDY AREA

This study was conducted at Kakamega PGH Maternity unit. It is the Referral and Teaching Hospital for M.T.C. Students. It is situated in Kakamega town in Western province. The hospital has a comprehensive Obstetric unit with 100 bed capacity. The unit has two Obstetricians, two medical officers, several medical officer interns and thirty nursing staffs. The patients are admitted to the unit directly or as referrals from other health facilities within the province and traditional birth attendants. It has delivery rate of about 4000 per annum and cesarean rate of about 20 -30%. Western province had a population of 3,357,000 people in 1999 census and 3676000 people in 2002. Crude birth rate of 45, Total fertility rate of 6 and infant mortality rate of 100.6 per 1000 live births (24, 25).

STUDY POPULATION

Mothers admitted in labour in PGH Kakamega obstetric unit during the study period.

INCLUSION CRITERIA

- All consenting mothers with Obstructed labour as per the diagnostic criteria
- All consenting mothers admitted in the unit in labour with a maternal or fetal indication that required an emergency caesarian section.

EXCLUSION CRITERIA

- Patients with obstructed labour who do not consent to participate in the study.
- Mothers admitted to the unit for delivery who do not consent to participate in the study.

METHOD

Mothers who were admitted to the maternity unit with obstructed labour as specified in the diagnostic criteria of obstructed labour during the study period were eligible for recruitment to the study group but only those who consented to participate in the study were recruited and assigned to this group.

The criteria of selection of mothers to the comparison group included consenting mothers admitted in the unit in labour without features of obstructed labour as specified but with a maternal or fetal indication that necessitated an emergency caesarian section to be performed. Selection of patients to the study group was every consecutive mother with obstructed labour who consented to participate in the study while that to the comparison group included every next consenting patient admitted after the study group client and who met the specified criteria. During the study period, the maternity staffs had been trained to recognize mothers at risk of developing obstructed labour and close labour monitoring of these mothers was observed so that none developed obstructed labour while in the unit. The patients selected to participate in the study were followed up by the principal researcher and two midwives trained on the study concept during their admission period. The maternal and fetal outcomes and other measurable parameters were obtained and entered in the structured questionnaires. Information on the patients file was also used to correlate the interview information and the status of the patient and the baby on discharge. Other data on the total occurrence of specific measurable outcomes were collected. The specific maternal and fetal outcomes and other measurable outcomes are presented in the study results.

SAMPLE SIZE

The determination of sample size was based on the magnitude of the general outcomes ie peri-natal mortality and maternal mortality.

From previous studies obstructed labour was associated with maternal mortality of 8% and peri-natal mortality of 18% (11, 20, 26) while review of outcomes of mothers undergoing emergency cesarean section had maternal mortality of 0.003% and peri-natal mortality of 5% (12, 27).

Using the maternal mortality as the measurable outcome, the minimum sample size was 118 mothers in each group while when using peri-natal mortality as the outcome, the sample size was 109 mothers in each group.

The sample size for this study was 135 mothers in each group.

The sample size was calculated using the formula as indicated in the next page.

Sample size (comparing equal proportions)

Formula Let p_i be the proportion of subjects in group i having the outcome of interest, $\bar{p} = (p_1 + p_2)/2$ and $\bar{q} = 1 - \bar{p}$.

$$H_0: p_1 - p_2 = 0$$

$$H_1: p_1 - p_2 = d$$

The sample size per group is

$$n' = \frac{\{z_{\alpha/2}\sqrt{2\bar{p}\bar{q}} + z_{\beta}\sqrt{p_1q_1 + p_2q_2}\}^2}{d^2}$$

$$n = n'/4 \left(1 + \sqrt{1 + 4/n'|d|}\right)^2 \text{ "continuity correction"}$$

Reference

Fleiss JL Statistical Methods for Rates and Proportions (2nd edition). Wiley:New York, 1981.

Factor under consideration	1ST GROUP	2ND GROUP	Symbol	Value
				"Peri-natal mortality"
				"Obstructed labour"
				"Comparison group"
Prob of "Peri-natal mortality" in "Obstructed labour" group			p_1	18.0%
Prob of "Peri-natal mortality" in "Comparison group" group			p_2	5.0%
$p_1 - p_2$			d	0.13
Odds Ratio			OR	4.17
Proportion of participants expected in "Obstructed labour" group			m_1	50.0%
Proportion of participants expected in "Comparison group" group			m_2	50.0%
Ratio of ("Obstructed labour": "Comparison group") sizes			r	1.00
P corrected			\bar{p}	0.115
Power			$1-\beta$	80%
			$z-\beta$	0.84
Confidence level			$1-\alpha$	95%
			$z-\alpha$	1.96
Number of subjects required for "Obstructed labour" group			n_1'	94
Number of subjects required for "Comparison group" group			n_2'	94
		Continuity correction for n_1'	n_1	109
		Continuity correction for n_2'	n_2	109
Sample size				218

STUDY INSTRUMENTS

This involved the use of structured questionnaires which was administered to the study participants correlated with specific information on the patients' files. The Questionnaires as annexed in appendix 1 contained simple structured questions that was administered during the interviews with the patients while other specific extra information were extracted from the patients file concerning the sociodemographic characteristics of the patient and the specific maternal and fetal outcomes.

DATA MANAGEMENT

All data was collected using a questionnaire and filled by the principal investigator and the assistants. Data collected was entered, cleaned and analyzed in SPSS version 15.0. Data analysis entailed the use of descriptive statistics such as frequency distributions and cross tabulations using the chi-square statistics. P values less than 0.05 was taken as statistically significant. Descriptive statistics for parametric and non-parametric was performed.

ETHICAL CONSIDERATION

Ethical approval to conduct the study was obtained from the Kenyatta National Hospital Ethical and research committee. Permission from the PGH Kakamega Management was also obtained before commencement of the study. Annexed 2 is the approval letter. Consent from the study participants was also obtained after necessary explanation to them about the study. Consent form is as annexed 3.

STUDY LIMITATIONS

1. Assessment of the duration of labour was based on the ability of the patient recalling when she started having regular painful contractions which could not be standardized on all patients and so the duration of labour for these patients might not be the true duration of labour.
2. This study was not able to evaluate the duration of time taken from the time of making the diagnosis of obstructed labour to the time the caesarian section which might significantly have an effect on the ultimate outcomes.
3. This study did not determine the causes of obstructed labour which is a limiting factor in formulation of preventive measures.

RESULTS

The study was conducted between 1st august 2008 and 31st January 2009.

Total number of mothers admitted in labour during the study period = 2120

Total number of mothers admitted with obstructed labour = 144

Total number of caesarian section = 610

Prevalence of obstructed labour $144/2120 = 6.8\%$

Caesarian section rate $610/2120 = 28.7\%$

Obstructed labour accounted for 23.4% of caesarian section.

Table 1; Socio-demographic characteristics

This table shows the social demographic characteristics of the mothers in both groups.

Characteristics	Study, n & % No=135	Comparison , n & % No =135	P- value
Age			
≤ 19	36 (26.7)	35 (25.9)	0.257
20-24	37 (27.4)	53 (39.3)	
25-29	25 (18.5)	20 (14.8)	
30-34	22 (16.3)	18 (13.3)	
≥35	15 (11.1)	9 (6.7)	
Marital status			
Single	23 (17.0)	17 (12.6)	0.366
Married	112 (83.0)	117 (86.7)	
Divorced	-	1 (0.7)	
Education			
primary	105 (77.5)	54 (40.0)	0.032
secondary	23 (17.0)	60 (44.4)	
college	5 (3.7)	17 (12.6)	
none	2 (1.5)	4 (3.0)	
Occupation of the mother			
housewife	89 (65.2)	96 (71.1)	0.05
casual	3 (2.2)	8 (5.9)	
self employed	16 (11.9)	4 (3.0)	
professional	5 (3.7)	13 (9.6)	
none	22 (16.3)	14 (10.4)	
Parity			
primigravida	51 (37.8)	58 (43.0)	0.043
multipara	51 (37.8)	60 (44.4)	
grandimultipara	33 (24.4)	17 (12.6)	

From the above table it can be shown that the age distribution was similar among mothers in both groups with 59.6 % being aged between 15 and 24years. Mothers who were married accounted to 84.8 % with no significant difference in the two groups. Majority of the mothers (97.7%) had at least primary level of education. Among the mothers in the study group, 77.5% of had primary education while 44.4% in the comparison group had secondary education (p 0.032) which is significant. Majority of the mothers 65% in the study group versus 71% in the comparison group were housewives .As for occupational status 18.2 % had some form of employment in both groups. Majority of mothers (97%) had height greater than 150cm with no significant difference in both groups. There was no significant difference in the two groups among the primipara and multipara but among the study group, 24.4% were grandmultipara against 12.6 % (p 0.043) in the comparison group which is statistically significant. In general, apart from the education level and occupational status of these mothers, there was generally no significant difference between the two groups in terms of sociodemographic characteristics.

Figure 1; Age distribution in both groups.

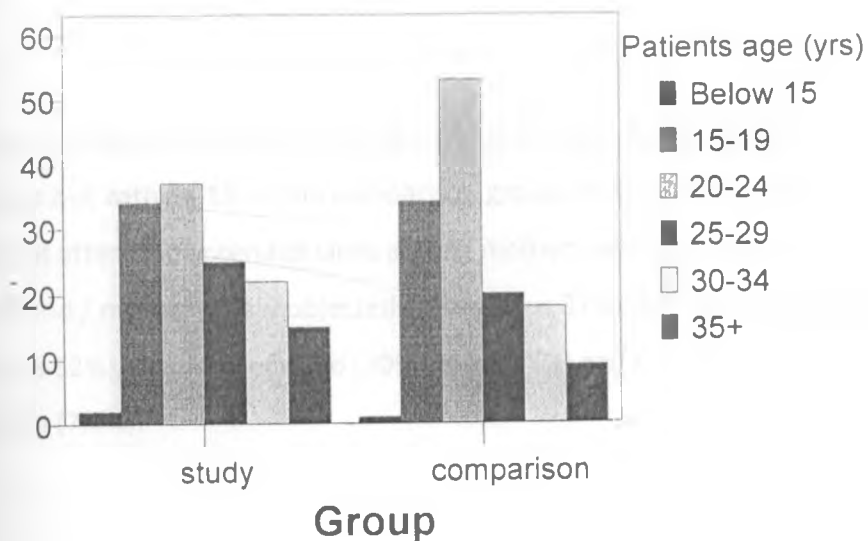


Table 2; Antenatal clinic attendance, indented place of delivery and factors that contributed to delay in presenting to hospital

Characteristics	Study, n & % No =135	Comparison , n & % No =135	P- value
Antenatal clinic attendance	90.4%	94.1%	0.318
Reasons for not attending clinic			
Husband/ mother in-law objected	77%	37.5%	0.047
Lack of funds	46%	62.5%	0.758
Unaware of need	30%	37.5%	0.567
Long distance to health facility	7.6%	0	0.316
Indented place of delivery			
Home	25%	9.6%	0.0000
TBA	26%	13.3%	
Hospital	49%	77.1%	
Family member refused	84 (26%)	22 (12%)	0.000
Lack of funds	90 (27%)	40 (23%)	0.000
Lack of ambulance from health centre	56 (17%)	70 (38%)	
Hospital staff perceived bad attitude	64 (19%)	30 (16%)	
Health facility far away	37 (11%)	20 (11%)	0.151

From this table, the antenatal clinic attendance was 90.4% of mothers with obstructed labour but with 94.1% in the comparison group which was not significant. Reasons given for not attending antenatal clinic among mothers with obstructed labour included, husband / mother in-law objected (77% versus 37%)-significant, lack of funds (46% versus 62%), unaware of need (30% versus 37%) and the long distance to the health facility (7.6%).

As for the chosen place of delivery by mothers in both groups majority of the mothers 49% in the study group versus 77.1% in the comparison group had indented to deliver in hospital, 25% in the study group versus 9.6% in the comparison had indented to deliver at home while 26% in the study group versus 13.3% in the comparison group had indented to deliver at the traditional birth attendant (P 0.000) which was statistically significant.

Factors that contributed to the delay in presenting to hospital among mothers in both groups included , lack of funds (27% versus 23%), family member refusal to give consent for hospital delivery(26% versus 12%) , lack of ambulance or transport facilities (17% versus 37%) and perceived community perception of health care providers bad attitudes towards patients(16% versus 18%).

Table 3; General status of the mother and fetus at admission

This table shows the general status of the mother and fetus at admission.

Characteristics at admission	Study, n & % No =135	Comparison , n & % No=135	P-value
Mothers general status			
Fair	109 (80.7)	118 (87.4)	0.134
Poor	26 (14.8)	17 (12.6)	
Fetal general status			
good	51 (37.80)	66 (48.9)	0.001
fetal distress	64 (47.4)	66 (48.9)	
intrauterine fetal death	20 (14.8)	3 (2.2)	

From this table it can be shown that the general status of the mothers at admission in both groups was not significantly different. As for the fetal status at admission 47.4% had fetal distress while 14.8% had intrauterine fetal death (p 0.001) which was statistically significant. Obstructed labour was significantly associated with higher rates of mothers presenting with intra uterine fetal death at admission.

Table 4; Maternal outcomes

This table shows the maternal morbidity in the two groups

Maternal outcomes	Study, n & %	Comparison , n & %	P- value
	No =135	No =135	
Intrapartum findings and complications			
bladder oedema	61 (45.5)	0	0.000
ruptured uterus	8 (6.0)	1 (0.7)	0.017
Infected uterus	8 (6.0)	0	0.04
Uterine tears	27 (20.0)	2 (1.5)	0.000
Bladder injuries	2 (1.5)	0	0.217
Perineal tears	1 (0.7)	0	0.315
Intra operative interventions			
Obstetric hysterectomy	7 (5.2)	0	0.016
Bladder repair	2 (1.5)	0	0.217
Transfusions	20 (14.9)	10 (7.4)	0.05
Postpartum outcomes			
Postpartum hemorrhage	20 (14.8)	6 (4.4)	0.004
Wound sepsis	58 (43.0)	16 (11.9)	0.000
Obstetric fistulas	3 (2.2)	0	0.82
Puerperal sepsis	36 (26.7)	18 (13.3)	0.06
Deep venous thrombosis	3 (2.2)	2 (1.5)	0.652
Lower limb nerve palsies	10 (7.4)	0	0.001
Depression / psychosis	9 (6.7)	2 (1.5)	0.031
Wound dehiscence	15 (11.2)	0	0.000
Burst abdomen	3 (2.2)	0	0.082
Referral for specialized treatment	3 (2.2)	0	0.082
Maternal death	0	0	0

Intrapartum findings and complications

Among the mothers who were found to have ruptured uterus, 6% were in the study group versus 0.7% in the comparison group (p 0.017) which is significant.

Uterine tears during surgery occurred in 20% among those in the study group versus 1.5% (p 0.000) in the comparison group which is significant.

Intraoperative interventions

Obstetric hysterectomy had to be performed on 5.2 %(p 0.016) of mothers with obstructed labour while 14.9%(p 0.05) of mothers in the study group had blood transfusion which is significant.

Postpartum outcomes

Among the mothers with obstructed labour, 14.8%(p 0.004) had postpartum haemorrhage, 43%(p 0.0001) wound sepsis, 2.2%(p 0.82) obstetric fistulas, 26.7% puerperal sepsis, 2.2%(p 0.652) DVT, 7.4%(P 0.001) lower limb nerve palsies, 11.2%(p 0.0001) wound dehiscence, 2.2% (p 0.082) burst abdomen and 2.2%(p 0.082) were referred for specialized treatment. There were no maternal deaths.

In summary from this study obstructed labour was significantly associated with increased maternal morbidities.

Table 5; Fetal Outcomes

This table shows the fetal outcomes in the two groups.

Fetal outcomes	Study, n & % No=135	Comparison , n & % No=135	P- value
Sex of baby			
Male	91 (67.0)	78 (57.8)	0.102
Female	44 (32.6)	57 (42.2)	
State of baby			
alive	110 (81.5)	130(96.3)	0.000
stillborn	25(18.5)	5 (3.7)	
FSB	15 (60.0)	5 (100.0)	0.083
MSB	10 (40.0)	0	
Birth weight			
< 2.5	1 (0.7)	14 (10.4)	0.000
2.5 – 3.5 kg	71 (52.6)	83 (61.5)	
3.5 – 4kg	40 (29.6)	26 (19.3)	
> 4 kg	23 (17.0)	12 (8.9)	
Apgar score			
< 5	5 (4.5)	3 (2.3)	0.000
5 – 7	28 (25.5)	9 (6.9)	
> 8	77 (70.0)	118 (90.8)	
Other interventions and outcomes			
Resuscitation	62 (56.4)	31 (23.8)	0.000
Immediate infant death	7 (6.4)	3 (2.3)	0.111
Newborn unit admission	29 (26.6)	7 (5.3)	0.000
Neonatal sepsis	18 (16.5)	3 (2.3)	0.000
Newborn unit deaths	3 (2.8)	2 (1.5)	0.502
Live infants from NBU	28 (25.2)	5 (3.8)	0.000

There was no significant difference on the sex of the baby in the two groups though the male baby (67%) was a significant factor among mothers with obstructed labour. Live births were 81.5 % (p 0.0001) while 18.5% were stillborns among mothers with

obstructed labour which was significant. Among the stillborns, 60% were fresh stillbirths. In terms of birth weight, 46.7% had fetal weight > 3.5 kg in study group as compared to 28.2% in the comparison group. As for the Apgar score, 30% of the fetus among mothers with obstructed labour had Apgar score of ≤ 7 versus 9.2% in the comparison group. Other fetal morbidities among the mothers who presented with obstructed labour included 56.4 % (p 0.0001) of the newborns requiring resuscitation, 26.6 % (p 0.0001) being admitted to the newborn unit, 16.5 % (p 0.0001) developing neonatal sepsis, immediate infant deaths of 6.4 % (p 0.111) and the newborn unit deaths of 2.8% (p 0.502).

From the above table, obstructed labour was significantly associated with adverse fetal outcomes i.e stillborns, low apgar score, need for resuscitation of newborns, new born unit admission, immediate infant death and neonatal sepsis.

Figure 2; Weight of the baby in both groups

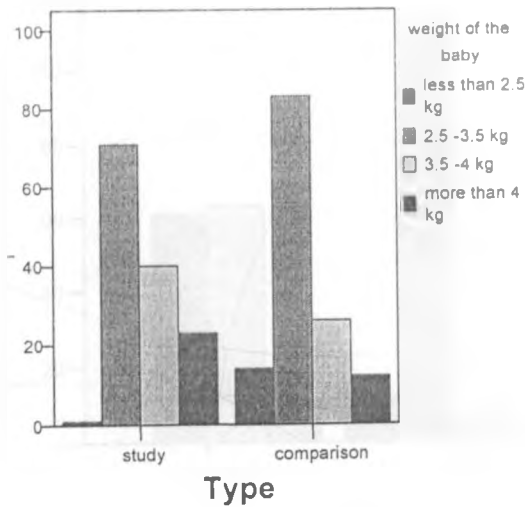


Figure 3; Apgar Score in both groups

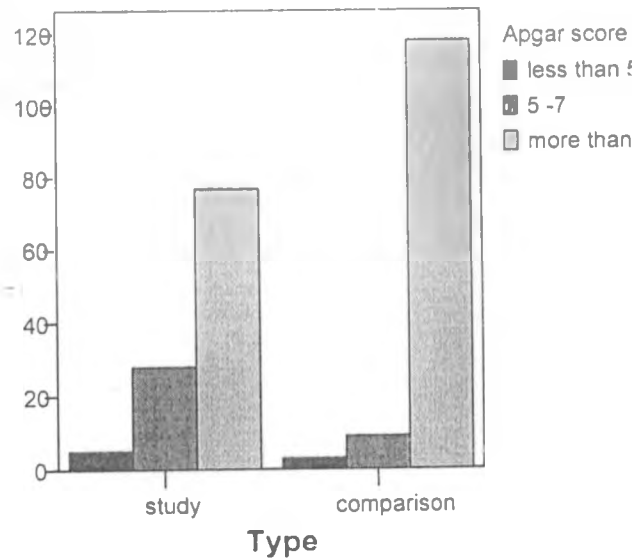


Table 6; Duration of Hospital stay

This table shows the duration of the hospital in both groups.

Duration of hospital stay in days	Study, n & % No =135	Comparison , n & % No= 135	P-value
Less than 4 days	0	12 (8.9)	0.000
4 – 7 days	61 (45.2)	114 (84.4)	
8 – 14 days	63 (46.7)	8 (5.9)	
More than 14 days	11 (8.1)	1 (0.7)	

From this table it can be shown that 54.8% of mothers with obstructed labour had prolonged hospital stay of more than 8 days versus 6.6% in the comparison group. Obstructed labour was significantly associated with longer hospital stay.

Figure 4; Duration of hospital stay in both groups.

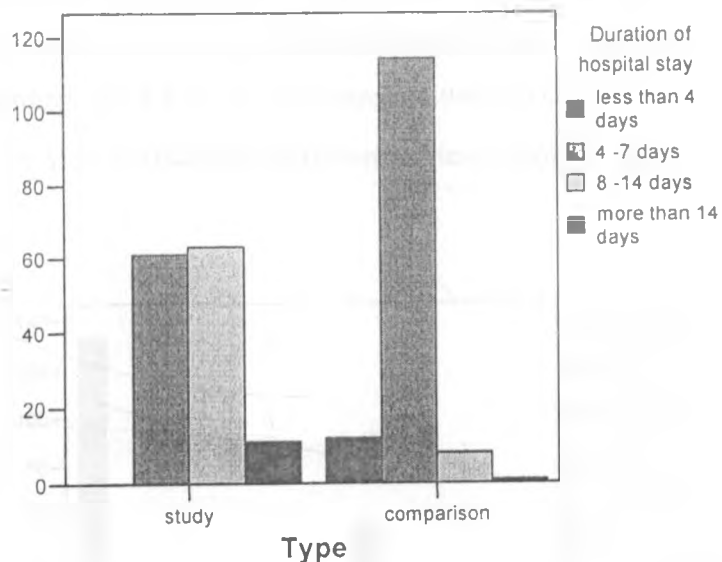


Table 7; Indication for caeserian section

This table shows the indication for caeserian section among the study participants in both groups.

Indication	Study No=135	Comparison No= 135
Obstructed labour	49.8%	
NRFS		20.4%
Breech		8.9%
Previous caesarian scar		6.7%
Prolonged labour		8.2%
APH		3.3%
PET/ Eclampsia		1.9%
CPD		0.7%

Obstructed labour accounted for 23.4% of caeserian section performed during the study period. From this table it can be shown that almost all the patients with obstructed labour apart from one were delivered by caeserian section. The indications of caeserian section in the comparison group included; Non reassuring fetal status(20.4%), breech(8.9%), prolonged labour(8.2%), previous c-section(6.7%), antepartum haemorrhage(3.3%), PET/eclampsia(1.9%)and CPD(0.7%).

Figure 5: Indication for caeserian section in both groups

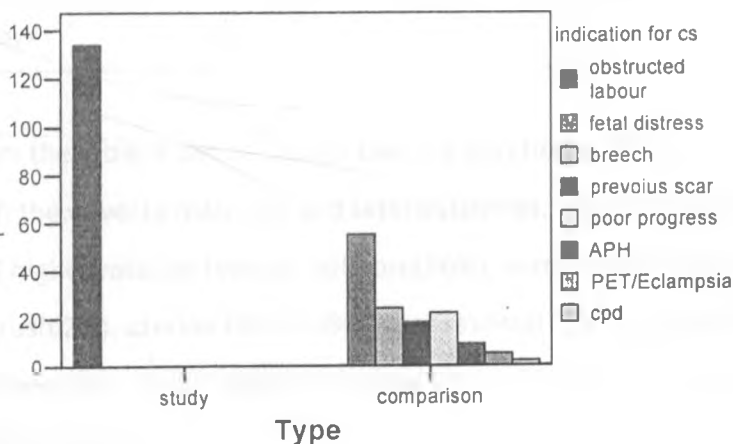


Table 8; Duration of labour , Fetal and Maternal outcomes in both groups

This table shows the relationship of the duration of labour and the maternal and fetal outcomes among the mothers in both groups.

Fetal outcomes	Less than 18hrs N-%		19 – 24hrs N-%		Greater than 24hrs %	
	Study	Compar'n	Study	Compar'n	Study	Compar'n
Stillborns	-	5 (100%)	11 (44%)	-	14 (56%)	-
Immediate infant death	1 (14.3%)	3 (100%)	1 (14.3%)	-	5 (71.4%)	-
NBU admission	1 (3.4%)	5 (71.5%)	21 (72.4%)	1 (14.3%)	7 (24.1%)	1 (14.3%)
Neonatal sepsis	1 (5.6%)	2 (66.6%)	15 (83.3%)	-	2 (11.1%)	1 (33.4%)
NBU Deaths	-	1 (50%)	2 (66.7%)	-	1 (33.3%)	1 (50%)
Ruptured uterus	-	1 (100%)	3 (37.5%)	-	5 (62.5%)	-
Uterine tears	-	1 (50%)	7 (25.9%)	-	20 (74.1%)	1 (50%)
PPH	-	5 (83.3%)	7 (35%)	-	13 (65%)	1 (16.7%)
Transfusions	1 (5%)	8 (80%)	6 (30%)	-	13 (65%)	2 (20%)
Hysterectomy	-	-	2 (28.6%)	-	5 (71.4%)	-
Wound sepsis	5 (8.6%)	10(62.5%)	30 (51.7%)	5 (31.3%)	23 (39.7)	1 (6.2%)
Obstetric fistula	-	-	-	-	3 (100%)	-
Peuperal sepsis	6 (16.7%)	13(72.1%)	14 (38.9%)	4 (22.2%)	16 (44.4%)	1 (5.7%)
DVT	-	-	1 (33.3%)	1 (50%)	2 (66.7%)	1 (50%)
Nerve palsies	-	-	4 (40%)	-	6 (60%)	-
Burst abdomen	-	-	1 (33.3%)	-	2 (66.7%)	-
Hospital stay more than 14 days	1 (9.1%)	1 (100%)	3 (27.3%)	-	7 (63.6%)	-

From the table it can be shown that the duration of f labour was significantly associated with the adverse maternal and fetal outcomes. Labour duration of more than 24 hours had higher rates as follows; stillborn(56%), immediate infant death(71%), ruptured uterus(62%), uterine tears(74%), poor reversal (100%) , PPH(65%), transfusion(65%), hysterectomy(71%), obstetric fistula(100%), DVT(67%), nerve palsies(60%) and burst abdomen(67%).

Table 9; Obstructed labour as a risk factor in developing adverse maternal and fetal outcomes.

Table 10 uses the independent samples t- test to compare the various fetal and maternal outcomes among mothers that presented with obstructed labour and those in the comparison group.

Fetal outcomes	Levene's significance	Levene's T test	Significance 2 tailed
Stillborns	0.000	3.9	0.000
Resuscitation	0.000	5.44	0.000
NBU admission	0.001	4.65	0.000
Neonatal sepsis	0.000	3.76	0.000
NBU Deaths	0.000	0.668	0.516
Maternal outcomes			
Ruptured uterus	0.000	2.05	0.035
Uterine tears	0.000	5.01	0.000
PPH	0.000	4.12	0.000
Transfusions	0.000	1.956	0.05
Hysterectomy	0.46	0.645	0.52
Wound sepsis	0.000	6.09	0.000
Obstetric fistula	0.001	1.75	0.082
Peuperal sepsis	0.000	2.77	0.000
Nerve palsies	0.000	3.27	0.001
Wound dehiscence	0.000	4.11	0.000
Hospital stay more than 14 days	0.000	9.84	0.000

Using the Levene's t-test a T value of greater than 1.96 was taken as significant.

Outcome variables of > 1.96 were significantly associated with obstructed labour and the risk of association over the comparison group are as detailed in the table. Mothers who presented with obstructed labour had increased risk of developing adverse fetal and maternal outcomes; stillbirths (3.9), need for newborn resuscitation (5.44), NBU admission (3.8), intraoperative uterine tears (5.01), PPH (4.12), wound sepsis (6.09),

nerve palsies(3.27), wound dehiscence (4.11) and hospital stay of more than 14 days (9.84).

DISCUSSION

Obstructed labour is one where in spite of good uterine contractions; the progressive descent of the presenting part is arrested due to mechanical obstruction (4). From this study the prevalence of obstructed labour was 6.8% while worldwide it is estimated at 5%. In a previous study, labour complication in rural Kenya in Kilifi, Obstructed or prolonged labour was the most commonly noted labour complication (8.5%) (5) while prevalence of obstructed labour in a study in Aminu Kalo Teaching Hospital in Nigeria was 8.5%. This study found that the magnitude of obstructed labour in our set up is similar to other regions.

In this study obstructed labour accounted for 23.4% of caesarian section performed. The age distribution in the two groups was not statistically different with majority being aged between 15 and 24 years. Majority of the mothers (84.4%) were married with no difference in the two groups. Level of education was a significant factor among mothers with obstructed labour with 77.5% of them having a low educational status ie primary level with only 17.5% having attained secondary education compared to 40% (primary) and 44% (secondary) in the comparison group. In terms of occupation only 3.7% of mothers with obstructed labour had professional occupation against 9.6% in the comparison group though generally majority of the mothers in both groups were housewives. There was no significant difference in the two groups among the primipara and multipara but among the study group, 24.4% were grandimultipara against 12.6% in the comparison group. Previous studies have also found that obstructed labour is more common among primigravidas and grandimultiparous women. We should put more emphasis on counseling these mothers during there antenatal visits on need for hospital delivery.

The study found that while the sociodemographic characteristics were general statistically similar mothers who presented with obstructed labour had low educational and occupational status. More emphasis should be put on improving the educational and the socioeconomic status of women.

Better antenatal care of mothers is associated with favourable pregnancy outcomes.

About 90% of pregnant women in Kenya are seen by professional health providers at least once through Antenatal Care clinics but only half of them receive professional skilled attendance at birth, the majority delivering at home under unskilled attendance, usually the TBA [23]. In this study 90.4% of mothers with obstructed labour attended antenatal clinic compared to 94.1% in the comparison group. 52.7% had 2-3 visits, 45.3% more than 3 visits while 11.5% made one visit. The antenatal attendance rate in the two groups was 92.2% which corresponds to the western province rates but higher than the 88% National level in the KDHS 2003 (25). Reasons given for not attending antenatal clinic included, husband / mother in-law objected (45%), lack of funds(30%), unaware of need(20%) and the long distance to the health facility(5%).Whereas 49% of the mothers with obstructed labour had intended to deliver in hospital, 27% had planned to deliver at the TBA and 25% at home. Given that over 90% of mothers with obstructed labour attended clinic once or twice, there is need to improve on the health talks given to this mothers at the ANC on the importance of safe obstetric care at the time of delivery. Some of the reasons given for the delay in presenting to hospital included lack of funds (27%) and family member refusal to give consent for hospital delivery (26%) were the major factors especially among mothers that presented with obstructed labour. Lack of ambulance or transport facilities (17%) and perceived community perception of health care providers bad attitudes towards patients (19%) were also notable concern. Emphasis should be put on improving the social economic status of women, community education on safe obstetric practice and improvement in the referral system through provision of accessible transport facility at the primary and secondary level facilities.

The approach to improving maternal and perinatal health in developing countries has shifted to safe motherhood programmes that focus on improving care during labour including strengthening emergency obstetric services. Having a health worker with midwifery skills present at delivery is now seen as one of the most critical interventions for making motherhood safer (5).

The general status of the mothers at admission in both groups was not significantly different with 19% among obstructed labour and 12% in the comparison group being admitted in poor general status. As for the fetal status at admission 47.4% had fetal distress while 14.8% had intrauterine fetal death ($p < 0.001$) among those with obstructed labour compared to 48% and 2.2% with fetal distress and intrauterine fetal death respectively in the comparison group.

Health education to mothers during the antenatal clinic should focus on encouraging them to present to hospital early in labour to prevent complications.

Obstructed labour has been noted to be associated with increased maternal and fetal morbidities (5, 12). This study found that mothers who presented with obstructed labour were significantly associated with adverse maternal morbidities compared to those in the comparison group which correlates with previous literatures on obstructed labour. In this study 6% had rupture of the uterus with 66.7% of this occurring among the grandmultipara. 5.2% ($p < 0.016$) of these mothers had obstetric hysterectomy.

Previous study by Ndede [1990] on review of rupture of the uterus in KNH found that spontaneous rupture of uterus due to obstructed labour accounted for 81% [10].

2.2% ($p < 0.82$) of mothers with obstructed labour in this study developed obstetric fistula with 66.7% being more than 30 years of age. Previous studies indicate higher incidence among the nullipara, especially in countries where childbearing starts at an early age. In a study by Mabeya on VVF in Rural District in Kenya, obstructed labour was the major cause of obstructed labour with > 90% being under 20 years [22].

Other maternal morbidities among mothers who presented with obstructed labour included 20% of sustaining tears of the uterus intraoperatively which necessitated repair. 14.8 % (p 0.004) had postpartum hemorrhage with 14.9 % (p 0.05) being transfused.

Wound sepsis accounted for 43%(p 0.0001), 26.7% puerperal sepsis, 2.2%(p 0.652) DVT, 7.4%(P 0.001) lower limb nerve palsies, 11.2%(p 0.0001) wound dehiscence, 2.2% (p 0.082) burst abdomen and 2.2%(p 0.082) were referred for specialized treatment. There were no maternal deaths. In a study at University Teaching Hospital Nigeria, obstructed labour accounted for 33% of wound infection and 27% of puerperal sepsis (7).

At University Teaching Hospital Nigeria, obstructed labour accounted for 33% of wound infection and 27% of puerperal sepsis (7).

In this study adverse perinatal outcomes were significantly higher among mothers who presented with obstructed labour. 81.5 % (p 0.0001) were live births with 18.5% being stillborns. Among the stillborns, 60% were fresh stillbirths. 46.7% had fetal weight > 3.5 kg as compared to 28.2% in the comparison group. 30% of the fetus had Apgar score of ≤ 7 versus 9.2% in the comparison group. 56.4 % (p 0.0001) of the newborns required resuscitation and 26.6 % (p 0.0001) were admitted to the newborn unit.

Neonatal sepsis developed in 16.5 % (p 0.0001) while 6.4 % (p 0.111) were immediate infant deaths and 2.8% (p 0.502) being newborn unit deaths .Previous study by Kavoo-Linge & Rogo identified prolonged labour/obstructed labour as a particularly important factor for perinatal deaths occurring within the first 24 h after hospital delivery in Kenya, while labour complications were associated with perinatal death in almost 40% of deliveries in another rural district hospital in kenya (20, 1). In a five year retrospective study on obstructed labour in the Medical College & Hospitals, Calcutta India by S Adhikari¹ found Perinatal mortality was 12.90%. At birth, 28.57% babies were severely depressed. 8.57% of the live born babies continued with poor apgar scores at 5 minutes. Maternal mortality was 2.04% (2).

Duration of hospital stay was longer among mothers with obstructed labour with 54.8% of them having prolonged hospital stay of more than 8 days versus 6.6%(p 0.000) in the comparison group which is statistically significant. This had a higher cost implication to the mother and the healthcare system.

Almost all the patients apart from one were delivered by caesarian section. The indications of caesarian section in the comparison group included, non reassuring fetal status(20.4%), breech(8.9%), prolonged labour(8.2%), previous c-section(6.7%)- antepartum haemorrhage(3.3%), PET/eclampsia(1.9%)and CPD(0.7%).

Duration of labour was significantly associated with the adverse maternal and fetal outcomes. Labour duration of more than 24 hours had increased risk of adverse outcomes ie stillborn(56%), immediate infant death(71%), ruptured uterus(62%), uterine tears(74%), poor reversal (100%) , PPH(65%), transfusion(65%), hysterectomy(71%), obstetric fistula(100%), DVT(67%), nerve palsies(60%) and burst abdomen(67%). Emphasis should be put on safe obstetric practice and use of partograph to prevent prolonged labour.

CONCLUSION

1. The prevalence of obstructed labour was 6.8%.
2. Women obstructed labour had low educational and socioeconomic status compared to the comparison group (p 0.032, 0.05).
3. While 90% of mothers with obstructed labour had attended antenatal clinic only 49% had intended to deliver in hospital.
4. Factors that contributed to the delay in presenting to hospital included; lack of funds (27%), husband or mother inlaw refusal to give consent for hospital delivery (26%), lack of transport or ambulance at the primary and secondary level facility (17%).
5. Obstructed labour was associated with significant maternal morbidities; ruptured uterus 6%, obstetric hysterectomy 5.2 % (p 0, 0015), uterine tears 14.8% (p 0.000), postpartum hemorrhage 14.9% (p 0.000), wound sepsis 43% (p 0.0001) and puerperal sepsis 26.7% (0.000).
6. Obstructed labour was associated with significant fetal morbidities; stillborns 18.5% (p 0.0001), low Apgar score 30%, newborn unit admission 26.6% (p 0.0001) and neonatal sepsis 16.5% (p 0.0001).

RECOMMENDATIONS

1. Focus must be put on the improvement of educational and the socioeconomic status of women.
2. Restructuring of M.C.H. Services should be done with particular attention to promotion and improvement of counselling skills to health care providers through trainings in order for them to give quality health talks to our antenatal clients on safe obstetric care.
3. Establishment of a streamlined and effective referral system at the primary and secondary health care facilities.
4. Improve on accessibility and availability of efficacious and safe obstetric care.
5. Community and Healthcare staff partnership in the provision of safe obstetric care through educating the community on importance of hospital delivery and safe obstetric practices.

APPENDIX 1

QUESTIONNAIRE

SERIAL NUMBER Test Control

HOSPITAL NO

1. Patients age in years

Below 15 yrs

15 – 19 yrs

20 -24yrs

25 -29yrs

30 -34 yrs

35 -39 yrs

Above 40 yrs

2. Marital Status

Single

Married

Separated

Divorced

3. Religion of the patient

Catholic

Protestant

Muslim

Others(specify)

4. Patients highest level of formal education

No formal education

Primary

Secondary

College

University

5. Parity Gravida

6. Occupation of the woman

House wife

Casual labourer

Self employed

Professional

7. Occupation of the husband

Unemployed

Casual labourer

Self employed

Professional

8. Gestational agewks

9. Heightcm Weightkg Shoe size

10. Facility attended ANC

None

Dispensary

Health centre

Private clinic

Mission Hospital

District Hospital

PGH

TBA

11. Reason for not attending ANC

- Not aware of need of ANC
- Lack of finances
- Lack of facility
- Family member refused
- Health care providers not welcoming

Other reason

12. Number of Antenatal visits attended.....

13. Preferred place of delivery

- Home
- TBA
- Hospital

14. Referring Facility

- Dispensary
- Health centre
- Private clinic
- Mission Hospital
- District Hospital
- Self refferal
- TBA

15. Duration of stay in the referring facilityhours

16. Reason for the delay in presenting to hospital

- Husband not around/ mother in-law objected
- No funds
- No transport/ vehicles
- Long distance to hospital
- Other reason

17. General status of the patient at Admission

Good

Fair

Poor

18. Status of the Fetus at admission

Good

NRFS

IUFD

State of liquor

Clear

Bloody

Meconium

Fowl smelling

Absent

If Meconium

Grade 1

Grade 2

Grade 3

19. Examination finding at admission

Good

Dehydrated

Septic

Band's ring

Vulval oedema

Episiotomy

Caput

Moderate

Excessive

Cervical dilatation

Fully dilated

8 – 9 cm

< 7 cm

20. Mode of delivery

Emergency c/s

Operative vaginal delivery

SVD

Breech

21. If any operative vaginal deliveries, specify the type

Episiotomy done

Destructive delivery

22. Was there any perineal or vulval tears

Yes

No

23. If yes, specify the degree of tear

1st degree

2nd degree

3rd degree

16. Duration of labour hours

24. For the mothers who underwent cesarean section

Indication for c/section

Characteristics of urine on catheterization

Clear

Bloody

Bladder findings

Normal

Oedematous

Ruptured

State of the uterus

Normal

Hyperaemic

Ruptured

Infected

Intra operative diagnosis

POPP

Lower uterine segment tumour/myomas

Vertex

Breech

Malpresentation(specify).....

25. Sex of the baby

Male

Female

26. Was the baby alive or still born?

Alive

Still born

27. If still born specify whether it was MSB OR FSB

FSB

MSB

28. Baby's birth weight

Below 2500gms

2500 – 4000 gms

Above - 4000 gms

29. Baby's Apgar score at 5 minutes

8 and above

5 – 7

Below 5

30. Was the baby resuscitated e.g by ambu bag, oxygen, drugs etc

Yes

No

31. Fetal outcomes

Normal live infant

Immediate infant mortality

Newborn unit admission

Neonatal sepsis

Need for NBU antibiotics

Duration of newborn unit stay

Newborn mortality

Live stable baby from newborn

32. Intra operative complication

- Uterine tears
- Bladder injuries
- Poor reversal
- Post partum hemorrhage
- None

33. Intra operative procedure/ interventions

- Obstetric hysterectomy
- Bladder repair
- Blood transfusions
- ICU admission
- None
- Others (specify)

34. Post partum outcomes

- Postpartum hemorrhage
- Post partum wound sepsis
- Obstetric fistula
- Puerperal sepsis
- Post partum Deep Venous thrombosis
- Post partum nerve palsies
- Post partum depression/ psychosis
- Duration of Hospital stay
 - Less than 4 days
 - 4 – 7 days
 - 7 – 14 day
 - > 14 days

35. Was the mother referred to other specialized facilities

Yes

No

36. Reason for referral

37. Was there maternal mortality

Yes

No

38. Exact cause of maternal death

APPENDIX 3:

CONSENT

My name is Dr Musimbi Soita. I am conducting a study on obstructed labour which is a condition in labour where the passage of the fetus in the birth canal is arrested thus affecting the wellbeing of the mother and the fetus. The study aims to look at the factors contributing to this complication and the maternal and fetal outcome.

Your participation in the study will enable the researcher and the health care systems formulate interventions to address this complication. Participation in this study is voluntary. No financial benefit will be obtained for participating. The information obtained from you will be confidential. No interference or denial of service will occur for declining to participate.

Having read, understood and as explained to by the researcher,

I voluntarily give consent to participate in the study.

Signed.....

Date.....

Witness.....

Date.....

Kiswahili

Jina langu ni Dakitari Musimbi Soita, ninafanya utafiti kuhusu matatizo inayowapata mama wacha wazito kujifungua mtoto kwa sababu kuna ugumu mtoto kupita kwa njia ya uzazi. Kwa kushiriki kwa huu utafiti, utamuezesha mtafiti na idara ya afya kuweka mikakati ya kuzuia hii shida. Kushiriki kwa huu utafiti ni kwa hiari yako. Hutapata pesa zozote kwa kushiriki. Habari utakayotupa itabaki siri. Ni haki yako kukataa kushiriki na uamuzi wako hautadhuru matibabu yako.

Baada ya kusoma na kuelezwa, Mimi..... Ninakubali kujihusisha na utafiti huu.

Sahihi ya muhusika au alama ya kidole gumba ya kushoto

Sahihi na jina la shahidi

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22nd July 2008

Dear Dr. Soita

RESEARCH PROPOSAL: "FETAL AND MATERNAL OUTCOMES OF MOTHERS PRESENTING WITH OBSTRUCTED LABOUR AT PROVINCIAL GENERAL HOSPITAL, KAKAMEGA."(P59/3/2008)

This is to inform you that the Kenyatta National Hospital Ethics and Research Committee has reviewed and **approved** your revised research proposal for the period 22nd July 2008 – 21st July 2009.

You will be required to request for a renewal of the approval if you intend to continue with the study beyond the deadline given. Clearance for export of biological specimen must also be obtained from KNH-ERC for each batch.

On behalf of the Committee, I wish you fruitful research and look forward to receiving a summary of the research findings upon completion of the study.

This information will form part of database that will be consulted in future when processing related research study so as to minimize chances of study duplication.

Yours sincerely

PROF A N GUANTAI
SECRETARY, KNH-ERC

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