TITLE

QUALITY OF PARTOGRAM RECORDINGS AND PERINATAL OUTCOMES AT MUHIMBILI NATIONAL HOSPITAL, TANZANIA

By

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A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Medicine in Obstetrics and Gynecology of the Muhimbili University of Health and Allied Sciences

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CERTIFICATION

The undersigned certify that she has read and hereby recommend for acceptance by the Muhimbili University of Health and Allied Sciences in Dar es Salaam, a dissertation entitled: QUALITY OF PARTOGRAM RECORDINGS AND PERINATAL OUTCOMES AT MUHIMBILI NATIONAL HOSPITAL, TANZANIA, in fulfillment of the requirements for the degree of Master of Obstetrics and Gynecology of the School of Medicine.

…….....

Professor S. N. Massawe

(SUPERVISOR)

Date……..

DECLARATION AND COPYRIGHT

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DEDICATION

I would like to dedicate this dissertation to my lovely wife Prisca and my daughters Paula and Grace.

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ABBREVIATIONS

AVD------ Assisted vaginal delivery

CS ------- cesarean section

FHR ------ Fetal heart rate

IPPM ----- Intramural private practice Muhimbili

LGA ------Local Government Area

MNH -----Muhimbili national hospital

MUHAS --Muhimbili University of Health and Allied Sciences

PHC ------Primary Health Care

WHO ---- World Health Organization

FSB ----- Fresh Stillbirth

MSB ----Macerated Stillbirth

SVD----- Spontaneous vertex delivery

ABSTRACT

Introduction; The management of labor using partogram is the standard way of improving both maternal and perinatal outcomes. The partogram increases the quality and regularity of all observations on the fetus and the mother in labor and aids early recognition of problems in both mother and fetus. Correct recording of labor parameters in the partogram is a reliable tool to estimate midwives' operation. Tanzania has high maternal and perinatal mortality rates. One third of stillbirths takes place during delivery and is largely avoidable. It is estimated that 40% of stillbirths are associated with substandard fetal heart monitoring during labor.

Objective; This study aimed at assessing the quality of partogram recordings and compare with fetal outcomes among women delivering at Muhimbili National Hospital.

Methodology; It was a crossectional study in which partograms of women whose labor was monitored using partogram delivered in the hospital were reviewed immediately after delivery. The study was conducted from 1st September to 30th November 2011. Using a checklist, recordings of parameters of labor in partogram, fetal outcomes (Apgar score at 5 minute, still birth and admission to neonatal ward for special care) and immediate maternal outcomes (PPH, perineal tear, visceral injuries following cesarean section) were assessed. Partogram recordings of labor parameters were judged as standard if standard recorded or substandard if not recorded as per standard protocols.

Results; Partogram was used in all women who were admitted in labor ward with spontaneous labor. A total of 1,051 partograms were reviewed during the study time. Only 8.9% of partograms had all parameters with standard recordings. The most unrecorded parameter was

maternal pulse rate. Most (81.4%) of partograms had substandard recordings of uterine contraction.

There were 53 newborns with Apgar score less than 7 at 5 minutes and 17 fresh stillbirths. Substandard fetal heart rate recording in the partogram is significantly associated with Apgar score less than 7 at 5 minute and stillbirths. (P-value<0.001, Chi-square 15.92).

Majority (79.5%) had spontaneous vaginal delivery and 18.6% delivered by cesarean section. Though there were a trend of association but statistically substandard partogram recordings were not associated with immediate adverse maternal outcomes.

Conclusion: This study as other studies conducted as where found high proportion of substandard partogram recordings. Substandard recordings of fetal heart rate and uterine contractions were significantly associated with adverse fetal outcomes. Supervisory mechanisms and on job training on partogram use are recommended as a way of improving labor monitoring and standard recordings. This will improve both fetal and maternal outcomes.

CHAPTER 1

INTRODUCTION

The management of labor using a partogram is believed to be the standard way of improving both maternal and perinatal outcome. The partogram is a simple chart for recording information about the progress of labor and the condition of a woman and her baby during labor. The partogram is a tool that serves as an early warning system and can assist in early decision making on transfer, augmentation or immediate delivery. The partogram increases the quality and regularity of all observations on the fetus and the mother in labor and aids early recognition of problems in both maternal and baby.[1]

The development of partogram was originally done by Friedman in 1954 based on the observations of cervical dilatation and fetal station against time elapsed in hours from onset of labor. [2] Philpott in 1972 did extensive studies in primigravidae in central and South Africa where he constructed a graph of cervical dilatation against time. He introduced the concept of alert line and action line. The alert line represented the mean rate of progress of the slowest 10% of patients in the African population whom they served. Action line drawn four hours to the right of the alert line showing that if the patient has crossed the alert line active management should be instituted within 4 hours.[3]. These early partograms formed the foundation for the WHO model of the partogram, which was developed as an international standard in 1988 following the launch of the worldwide Safe Motherhood Initiative[19].

The partogram has three components, which includes the fetal condition, the progress of labor and the maternal condition. One of the parameters used in monitoring of fetal condition during labor include fetal heart rate, according to WHO protocol is recorded half hourly in

first stage of labor and every 15 minutes in second stage of labor. It is judged to be standard if at least recorded hourly.[19]

Other parameters are membrane status, liquor quality and amount, and molding. The progress of labor is central part of partogram, records the rate of cervical dilatation, descent of presenting part and pattern and strength of uterine contractions. The third component record maternal temperature, pulse rate, maternal blood pressure, and regular urinalysis.

The WHO model of partogram was devised by informal working group who examined most of the available published work on partogram and their design. It represents in some ways a synthesized and simplified compromise which includes the best features of several partograms used now in several countries including the one used at Muhimbili National hospital.

This model is based on the following criteria for management of labor;

Start the partogram for the mother who is in labor and you should have checked that there are no complications of the pregnancy that require immediate action.

The active phase of labor commences at 4 cm cervical dilatation

Vagina examination and descent of the presenting part should be assessed every 4 hours. However in advanced labor the frequency of vaginal examination might increase especially in multipara.

For normal labor the cervical dilatation should not go beyond the alert line. Charting should be along it or to the left of it.

Frequency and duration of uterine contraction is done hourly and half hourly during the latent and active phases of labor respectively. The frequency to be assessed per 10 minutes and the duration shaded as < 20 seconds,20-40 seconds and > 40 seconds with dotting, half shade and total shading respectively.

Fetal heart rate recorded half hourly.

Membranes status(Intact or Ruptured),if ruptured assess the liquor quality (clear or Meconium stained) and molding assessed 4 hourly,

Maternal pulse rate assessed half hourly while temperature and blood pressure 4 hourly.

If labor went beyond the action line immediate intervention should be taken which is full medical assessment for the cause and manage accordingly.

Latent phase duration < 8 hours.(Although the current partogram excludes latent phase. The one used at MNH has latent phase. It is recommended that do not augment at this phase unless there is an indication .No artificial rupture of membranes at this phase however this can be done anytime at the active phase or between the alert and action line if mother is confirmed HIV negative.

These protocols were applied in WHO multicenter trial and it gave the good outcomes which lead to the development of the partogram model we are using currently. However local adaptation may be made[4].

Partogram has been recommended by the WHO for monitoring progress of labor world-wide. The aim of partogram recommendation is to improve maternal and perinatal outcome. Despite the recommendation of WHO on partogram use, the perinatal mortality is still high especially in developing countries. Stillbirth account for over half of all perinatal deaths. One third of stillbirths takes place during delivery and is largely avoidable[5]. This high perinatal mortality rate has been associated with substandard partogram recordings of fetal heart rates which may be reflecting substandard monitoring of labor[6,7].

Perinatal outcome in terms of Apgar score <7 at 5 minutes has been associated with majority of neonatal deaths[6]. Adverse neonatal outcomes in terms of 5minutes Apgar score < 7,early neonatal deaths and intrapartum stillbirth are not only related to maternal health but also it is the best indicator for the quality of health care services [8].This study aimed at assessing the partogram recordings if they are done as per standard and whether the recordings have effect on fetal outcomes in terms of Apgarscore at 5 minutes, stillbirth and admission to the neonatal ward.

Literature Review

The American women's college of midwifery recommend to all midwives to use the partogram entirely during the labor process because correct recording is a reliable tool to estimate midwives' operation. In spite of the fact that partogram use has shown to improve maternal and perinatal outcomes, the partogram is not used all over the world.. In a study done Brazil, evaluation of quality of care for normal delivery, found out that partogram were used in only 28.5% of women in labor[11]

Proper use of partogram to monitor labor has been associated with good fetal outcomes. A population based case control study conducted in Brazil showed that lack of partogram use during labor and less than one FHR assessment per hour during labor were significantly associated with perinatal deaths[15]. Another study done in Uganda to assess partogram use during labor, found that good Apgar score was statistically significant associated with standard fetal monitoring[20].

A study done in Tanzania, introduction of a qualitative perinatal audit at MNH found out poor fetal heart monitoring during labor was directly associated with over 40% of perinatal deaths[6].

In contrast to the findings above, a study done in Indonesia to assessed the effectiveness of promoting the use of the WHO partogram by midwives for labor in a maternity home by comparing outcomes after birth, found that, Apgar scores of less than 7 at 1min were reduced significantly, whereas Apgar scores at 5mins and requirement for neonatal resuscitation were not significantly different. [12]

Substandard recordings of parameters of labor in a partogram have been observed in some studies. A study done in Uganda found out that partograms that fulfilled the standard monitoring of fetal heart rate were only 2% of the reviewed partograms [20]. In Tanzania, a study done to assess the partogram use found that fetal heart rate were not recorded in 6% of the reviewed partograms and in those recorded 86% of them were judged substandard. Other parameters like cervical dilatation, uterine contraction, maternal BP and maternal pulse rate in high proportions were also judged substandard[13].

Another study done in Pikine, Senegal showed an association between crossing action line and poor fetal outcome. In this study it was found that among the 1022 pregnant women who were monitored by partogram during 4 months, alert line was crossed in 100 (9·8%) of these cases and the frequency of neonatal resuscitation was higher for this group, as was the number of "fresh" stillbirths. Among the women who crossed the alert but not the action line, neonatal resuscitation was also four times more likely than for the normal labor group, and the fresh stillbirth rate was higher but not significantly so. For women who crossed both lines, the fresh stillbirth rate was ten times higher than for women in the normal labor group[14].

Proper partogram use and standard recordings reflects the level of knowledge of the user. In a study done in Nigeria it was found that the partogram was utilized mainly in tertiary health facilities but generally knowledge of partogram was poor. This study found that only 32.3% of the respondents used partogram to monitor labor. Partogram use was reported significantly more frequently by respondents in tertiary level compared with respondents from primary/secondary levels of care (82.4% vs. 19.3%;). Only 37.3% of respondents who were a predominantly from the tertiary level of care could correctly mention at least one component of the partogram[16].

Training on partogram use and recordings showed to have impact in terms of correct use of partograms. In a study done in Nigeria to assess the impact of training on use of the partogram for labor monitoring among various categories of primary health care worker found that, faults discovered in partogram construction mostly consisted of the following: not plotting fetal heart rate strictly every 30 min in some of the patients; not plotting the liquor color and presence of molding as appropriate. Some actions taken based on the partograms were inappropriate, these include delay in augmentation of labor due to unavailability of oxytoxin injection. Overall, the partogram was correctly charted in 76.9% of the cases that met the inclusion criteria, technical accuracy in plotting was achieved in 64.9% of cases, and appropriate action was taken based on partogram plotting in 93.4% of cases[17].

Another study done to study the impact of an educational intervention of midwives' use of the Angolan model of the World Health Organization's (WHO) partogram found that there is a positive effect of the educational intervention on the proper use of the partogram. The midwives improved in general their documentation of the partogram after the training. [18]

Statement of the problem

Currently maternal mortality rate at the national level is 454 deaths per 100,000 live births and the perinatal mortality rate is 36 deaths per 1000 total births.[8] These figures are still high when compared to other countries.

WHO advocates partogram use as a necessary tool in the management of labour and recommends its universal use during labour as a reliable way of improving both maternal and perinatal outcomes[1]. Some studies found the association between substandard recordings of parameters of labor with adverse fetal outcomes in terms of Apgar score less than 7 at 5 minute and still births.[6,13]. However, Fahdhy found no statistical significant association between standard partograms and Apgar score at 5 minutes[12].

Some health-care practitioners, especially in high-income countries, have questioned its effectiveness. For example, Walraven has suggested that use of the partogram can be an unnecessary interference in clinical work.[10]

These arguments create a gap of knowledge regarding whether the quality of partogram recordings is associated with perinatal outcome or not. Therefore there is a need to demonstrate the link between the quality of partogram recordings and perinatal outcomes especially at the tertiary teaching hospital.

Rationale

Correct partogram recording is a reliable too to estimate midwives' operation. The quality of partogram recordings reflects the quality of labor monitoring. With these facts in mind there is a need of assessing quality of labor care through assessing partogram recordings.

Poor fetal heart rate monitoring during labor has been associated with over 40% of perinatal death[6]. On the other hand Substandard fetal heart monitoring is associated with high number of still birth but has not clearly demonstrated the association of other fetal outcomes with the quality of partogram recordings[12].

The information that will be obtained will be of use to health care workers and policy makers on the fight to reduce poor perinatal and neonatal outcome. The results also will show gap available and suggest the appropriate solutions in reducing poor perinatal outcomes associated with labor.

Research question

Is there an association between the quality of partogram recordings and perinatal outcomes?

Objectives

Broad Objective

To assess the quality of partogram recordings and compare with perinatal outcomes for women delivering at Muhimbili national hospital Tanzania.

Specific objectives

1. To determine the proportion of standard partogram recordings of women delivering at Muhimbili national hospital.
2. To determine and compare the proportions between the quality of partogram recordings and newborn with adverse outcomes among women delivering at Muhimbili national hospital.
3. To determine and compare the quality of partogram recordings and immediate maternal outcome.

CHAPTER 2

METHODOLOGY

Study design

A cross-sectional study.

Study duration

The study was conducted from 1st September to 30th November 2011. All partograms of women delivering at the hospital during this time were reviewed.

Study setting

The study was conducted at Muhimbili National hospital which is a tertiary referral and a teaching hospital for the Muhimbili University of Health and Allied Sciences (MUHAS).The maternity block consists of seven wards, four antenatal and postnatal wards. Each ward has 38 beds capacity used to admit antenatal and postnatal mothers. Other wards are labor ward with 20 delivery beds and postnatal ward for observation of mothers after uncomplicated normal delivery before they are discharged home. The remaining ward is used as an obstetric intensive care unit for the patients with eclampsia and mothers in need of critical care.

There is a special neonatal care unit which provides neonatal care to premature newborns and sick babies born at MNH and surrounding hospitals. Babies born by CS are directly admitted at least for one day in neonatal unit for care or till their mothers become ambulant.

MNH offers specialized obstetric services for Dar es salaam city and its suburbs, through its department of obstetrics and gynecology. The city of Dar es salaam is estimated to have a population of more than four million people. Patients are also referred from nearby Coast region particularly from districts of Kisarawe, Kibaha and Bagamoyo. Apart from the referred patients, a substantial number of patients with or without obstetric complication come directly from home.

There are 3 districts in Dar es Salaam which are Ilala, Temeke and Kinondoni, each district has a district hospital which provides emergency obstetric care. However most of obstetric complicated emergencies in Dar es Salaam are referred to MNH.

All patients admitted to the MNH labor ward bring their antenatal cards which contain summaries of events during ANC. Information from the cards is supplemented by interviews of the patients and are recorded in the case note on admission. Delivery data, progress of labor, maternal and neonatal outcome are also recorded in the partogram. All these information are finally summarized in midwifery book before entering them into the obstetric data base.

Study population and study sample

Partograms of women delivered at MNH during the study time.

Study sample

All partograms of women delivered at MNH through the normal track who met the inclusion criteria

Inclusion Criteria

All partograms of women delivered at MNH through the normal track were included.

Exclusion Criteria

Women with the following characteristics their partograms were excluded from the study

- Admitted with cervical dilatation $\geq$8 cm
- Antepartum haemorrhage
- Multiple pregnancy
- Premature labor (Labor before 37 completed weeks)
- Preeclampsia/eclampsia

- Malpresentations (Non cephalic presentation)
- Previous uterine scar
- Admitted for elective cesarean section and IPPM patients
- Premature rupture of membrane (Rupture of membrane more than 6 hours before onset of labor)
- IUFD and those admitted with fetal distress.

Sample size

We considered in this study, partograms of all pregnant women, who were admitted to delivery in the hospital during the months of September, October and November 2011 and whom labor was monitored with partogram from active phase. Those with exclusion criteria their partograms were not reviewed.

Sampling technique

All partograms of women delivered at MNH during the months of September, October and November 2011 fitting the inclusion criteria were included in the study.

Training of Research assistants

Two research assistants, one from records and one nurse were recruited and trained on the use of checklist to extract information from the partograms according to standard of care. The training included the study procedures such as identification of study partogram, application of inclusion and exclusion criteria.

Data collection

Data were collected by using a checklist. All files of women soon post-delivery were reviewed and the information from partograms was collected using a checklist (Appendix 1). The inpatient numbers from the file were recorded in the checklist to avoid repetitions.

Study tool

Checklist was used to collect the information from the partograms. The checklist containing 27 items grouped into 4 sections were used for extracting information from the partogram. The first part recorded information about patient's age, gravidity, parity, estimated gestation age (by dates) and estimated time between onset of labor and hospital admission.

Second part recorded the parameters of labor which were fetal heart rate, liquor state, molding/caput, cervical dilatation, descent of head, uterine contraction, maternal BP, maternal temperature, maternal PR and maternal urine analysis. Each parameter was assessed as not recorded, standard or substandard recorded according to protocol of standard care (Operational definition).

The third part recorded the fetal outcomes. Fetal outcomes were assessed in terms of live birth (Apgar score 7 or more and Apgar score less than 7 at 5 minutes), still birth, need of resuscitation, admission to neonatal ward for special care and the reasons of admission.

The fourth part included information of the mode of delivery and immediate maternal outcomes. Mode of delivery was assessed as spontaneous vaginal delivery, assisted vaginal delivery (when ventouse used) cesarean section and hysterectomy. Immediate maternal outcome were recorded as good and adverse if the woman got PPH, perineal tear (second degree and above), need of blood transfusion, urinary bladder injury, hysterectomy or bowel injury.

Pretest study

A pilot study was conducted for one day to assess the flow of variables in the checklist, easy ways of obtaining information and other important aspects.

Study variables

Labor monitoring variables including fetal heart rate, liquor state, cervical dilatation, descent of the presenting part, and uterine contractions. Fetal variables including Apgar score at 5 minutes,need for resuscitation soon after delivery and admission to the neonatal ward for special care.

Data analysis

Data was entered into and analyzed using the SPSS database program version 16.

Univariate and bivariate analysis were done, univariate analysis for frequency computations and bivariate analysis in computing associations between variables. The Chi-square test was used to measure the strength of associations between variables, a p-value of <0.05 was considered to be statistically significant.

Ethical clearance

Ethical clearance was obtained from MUHAS ethical committee and permission to conduct the study was obtained from director of surgical services of Muhimbili national hospital

Ethical consideration

All the information obtained from the partogram remained confidential. Patient name were not used. Immediate after extracting the required information from the file, the file was returned back to the authority.

Operational definitions.

Adverse fetal outcomes include those newborns with Apgar score below 7 at 5 minutes, Stillbirth and admission to the neonatal ward for special care.

Immediate maternal outcome was considered good if there was no complication and adverse outcome if it was associated with complications like perineal tears (second, third and fourth degree tear), PPH, need of blood transfusion, urinary bladder injury, hysterectomy or bowel injury.

Protocols of standard care.

- Fetal heart monitored at least hourly is considered Standard
- Descent of presenting part recorded at least four hourly is considered standard
- Cervical dilatation recorded at least four hourly is considered standard
- Uterine contractions recorded at least hourly is considered Standard
- Maternal blood pressure recorded at least four hourly is considered Standard
- Maternal pulse rate monitored at least hourly is considered Standard

  Note; if the parameter is not recorded at all is marked as No records and if recorded but not according to standard as above is marked as substandard.

  A partogram with all 6 parameters with standard recordings was judged as standard and if at least one parameter with substandard recording was judged as substandard.

CHAPTER 3

RESULTS

During the months of September, October and November 2011, total deliveries were 2,372. The delivery rate was 26deliveries per day. Among these deliveries 716 received IPPM services and 1656 were admitted through the normal track. After reviewing the files of those who delivered through the normal track, 1051 partograms met the inclusion criteria, therefore reviewed using a checklist. (Figure 1)

Time between labor onset and hospital admission ranged between 1 hour and 23 hours. Majority (55.6%) got to the hospital within 5 hours after onset of labor and less than 1% got to the hospital more than 20 hours after the onset of labor. The median time between labor onset and hospital admission were 5hours

Figure 1; Flow diagram showing selection of study sample.

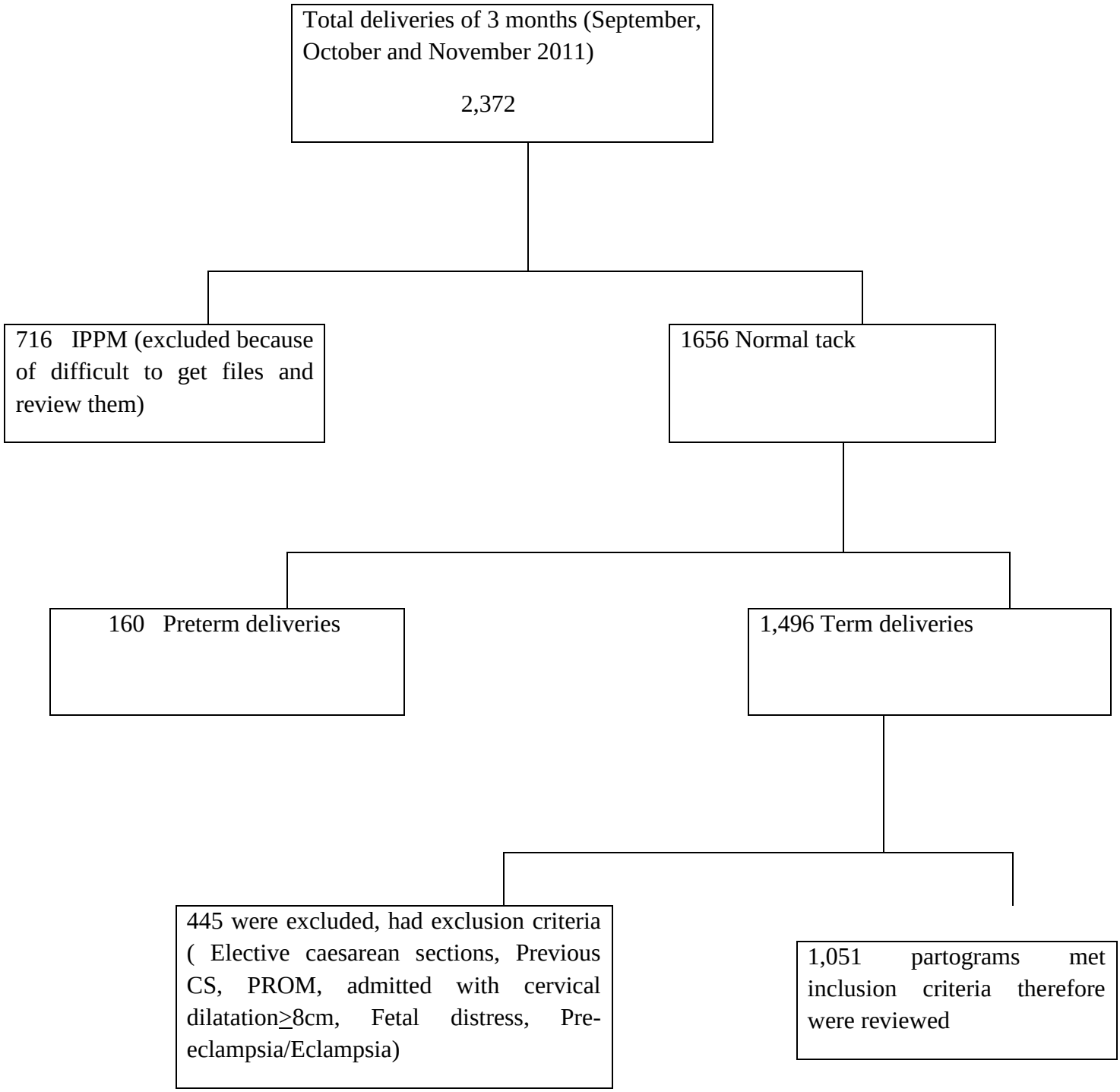


Table1; General characteristics of women whose partogram recordings were reviewed

	Count (N=1051)	Percentage
Age (Years)		
<20	91	8.7
20-30	633	60.2
31-35	207	19.7
>35	120	11.4
Gravidity (Weeks)		
Prim	456	43.4
2-4	528	50.3
≥5	67	6.4
Perinatal outcomes		
Apgar score ≥7 at 5minute	981	93.5
Apgar score <7 at 5 minute	53	5.0
Stillbirth fresh	17	1.6
Mode of Delivery		
Spontaneous vaginal delivery	836	79.5
Assisted vaginal delivery	20	1.9
Caesarean section	195	18.6
Immediate maternal outcomes		
Good outcomes	1029	97.9
With adverse outcomes	22	2.1

Table 1 show that, the age bracket of 15 to 19 years shows a little predominance with 8.7% of cases. Majority (60.2%) of women were in the age group of 20 to 30 years,the median age was 28 (SD ± 5.89 SD) years.

The primgravidae represent 43.4%of the sample. Half (50.3%) of the cases were gravida 2 to gravida 4.

Newborns with Apgar score less than 7 at 5 minutes were 53 (5%) and 17 (1.6%) were stillbirth. Eighty nine of the newborns were admitted into neonatal ward for care. Reasons for admission to neonatal ward were low Apgar score 53, Meconium aspiration 8, abnormal weight 11 (birth weight > 4Kg), abnormal breathing 9 and 8 of them due to congenital malformation.

Majority 79.5% had spontaneous vaginal delivery, 18.6% had cesarean section delivery.

Twenty two women succumbed to complications due to delivery. Two had cesarean hysterectomy, 13 got PPH, 5 had perineal tear, 1 got perineal hematoma and 1 had bowel injury

Table 2: Proportions of partograms with records of parameters of labor

Parameter of Labor	Recorded		Not Recorded
	Standard	Substandard	
Fetal heart rate	339 (32.3%)	712 (67.7%)	0 (0%)
Cervical dilatation	586 (55.8%)	465 (44.2%)	0 (0%)
Descent	630 (59.9%)	332 (31.6%)	89 (8.5%)
Uterine contraction	153 (14.6%)	856 (81.4%)	42 (4.0%)
Maternal BP	248 (23.6%)	735 (69.9%)	68 (6.55%)
Maternal bodyTemperature	234 (22.3%0	731 (69.6%)	86 (8.2%)
Maternal PR	460 (43.8%)	499 (47.5%)	92 (8.8%)
Overall partogram judged	85 (8.1%)	966 (91.9%)	0 (0%)

Table 2 show that in all partograms reviewed had fetal heart rate and cervical dilatation recordings with 32.3% and 55.8% having standard recordings respectively. Maternal pulse rate is the most unrecorded parameter among all. Uterine contraction is the leading parameter having substandard records (81.4%)

Overall 8.1% (85) of the reviewed partogram were judged to be standard. This means that they had all 5 parameters (FHR, Cervical dilatation, maternal BP, maternal body temperature and maternal PR) standard recorded.

Table 3: Association between quality of partogram recordings and perinatal outcomes

Parameter of labor	Perinatal outcome: Good (n=981)	Perinatal outcome: Adverse (n=70)	Total	P-value
Fetal heart rate				
Standard	332	7	339	0.000033
Substandard	649	63	712	
Cervical dilatation				
Standard	555	31	586	0.06
Substandard	426	39	465	
Descent				
Standard	587	43	630	
Substandard	317	15	332	0.01
Not Recorded	77	12	89	
Maternal BP				
Standard	234	14	248	0.53
Substandard	683	52	735	
Not Recorded	64	4	68	
Maternal Body Temperature				
Standard	220	14	234	0.6545
Substandard	679	52	731	
Not Recorded	82	4	86	
Uterine contraction				
Standard	151	2	153	0.0056
Substandard	789	67	856	
Not Recorded	41	1	42	
Liquor state				
Clear	666	31	697	P<0.000001
Meconium stained	140	29	169	
Not recorded	120	6	126	
Membrane intact	55	4	59	

*Adverse fetal outcome here means Apgar score less than 7at 5minute and stillbirth, good outcome means live birth with Apgar score >7 at 5 minute.

The table above show that substandard fetal heart rate monitoring has statistical significant association with adverse (Apgar score less than 7 at 5 minutes and stillbirth.) fetal outcomes (p value = 000033, Chi-square 15.92).

Substandard records of uterine contraction is associated with adverse fetal outcomes (p value = 0.0056, Chi-square 7.668).

Fetal outcomes seem not to be influenced by substandard recordings of maternal BP, PR and body temperature.

Meconium stained liquor seems to be associated with adverse fetal outcome as 29 out of 169 (17.2%) of those with meconium stained liquor had adverse outcome compared to 31 out of 697 (4.4%) of those with clear liquor (p-value<0.001, Chi-square 36.19)

Table 4 Shows impact of quality of partogram recordings on fetal outcome

Parameter of labor		Univariate Analysis				Multivariate Analysis			
	Number	OR	95% CI		P-value	OR	95% CI		P-values
Fetal heart rate		4.604	2.085	10.165	0.000	4.895	1.517	15.800	0.008
Standard	339								
Substandard and not recorded	712								
Descent		1.108	0.610	2.012	0.737	0.702	293	1.679	0.427
Standard	394								
Substandard and not recorded	657								
State of Liquor		1.723	0.911	3.260	0.094	1.215	.498	2.966	0.668
Standard	697								
Substandard and not recorded	354								
Cervical dilatation		1.647	1.011	2.683	0.045	1.784	0.762	4.179	0.182
Standard	586								
Substandard and not recorded	465								
Maternal Blood Pressure		1.256	0.687	2.298	0.459	1.018E8	0.000	.	0.999
Standard	248								
Substandard and not recorded	803								
Maternal Body Temperature		1.450	0.632	2.117	0.641	0.000	0.000	.	0.999
Standard	234								
Substandard and not recorded	817								
Uterine Contraction		6.186	1.500	25.508	0.012	1.450	0.305	6.901	0.641
Standard	153								
Substandard and not recorded	898								

Note; OR- Odds Ratio. 95% CI, Ninety five percent confidence interval

The results show that substandard and lack of fetal heart rate monitoring is significantly associated with adverse fetal outcome and is about 4.6 times higher in those with substandard or lacking fetal heart rate monitoring (OR, 4.604, 95% CI 2.09-10.17).

When fetal heart rate was adjusted for other factors (state of liquor, cervical dilatation assessment, maternal body temperature, Maternal Blood pressure, Descent and uterine contraction) still remained significantly associated though the association was weakened.

Uterine contractions had statistically significant association (OR 6.186, 95% CI 1.50-25.51) with adverse fetal outcome. The association was lost when adjustment for other factors was done as shown in the table 4 above.

Maternal Blood pressure (P=0.045, OR= 1.647) and cervical dilatation (P=0.459, OR=1.256) assessment had statistical marginal association with adverse fetal outcome and when adjusted for other factors the association was lost. Maternal body temperature, Descent and state of liquor had no statistically significant association with adverse fetal outcome.

Table 5: Association between quality of partogram and immediate maternal outcomes

	Immediate Maternal outcomes				
	Good (n=1029)		Adverse (n=22)		P- value
Standard partograms	83	(8.1%)	2	(9.1%)	0.8615
Substandard partograms	946	(91.9%)	20	(90.9%)	

Twenty two women succumbed complications due to delivery. Two had cesarean hysterectomy, 11 got PPH, 5 had perineal tear, 1 got perineal hematoma, 2 had urinary bladder injury and 1 had bowel injury. Out of 22 who got complications, 20 (%) had substandard partograms. There is no significant association between substandard partogram recordings and immediate adverse outcomes. (P-value = 0.8615, Chi square = 0.030)

CHAPTER 4

DISCUSSION

In this study it was found that all labors were monitored using partogram. Most of labor parameters had recorded at least once in the partogram. These findings show high proportion of partogram use in the hospital. Some partograms had no records for maternal pulse rate, descent of head, maternal body temperature and uterine contraction. These findings show some improvements when compared with other studies which found high proportions of unrecorded parameters of labor in the studied partograms. (13)

Despite the fact that partograms were used in all women in labor, majority (91.9%) of them were judged substandard based on the recordings. This gives an impression that either labour monitoring in the hospital is poor or there is inadequate recording of labour parameters in the partogram. This high proportion of substandard recordings of labour parameter also was observed in Uganda, they found that partograms that fulfilled the standard monitoring of fetal heart rate were only 2% of all the reviewed partograms. [20]

Fetal heart and state of liquor are the two most important parameters which are used to detect fetal distress. Two thirds (67.7%) of partograms in this study, had substandard recordings of fetal heart rate. This shows that based on these partogram recordings there was high probability of not diagnosing fetus that had distress on time. This study found that both Apgar score less than 7 at 5 minute and still birth is significantly associated with substandard fetal heart monitoring during labor (p-value = 0.000033).The association between substandard fetal heart monitoring during labor and adverse fetal outcome was also found in a study done in Tanzania.[6]

Uterine contraction was not recorded in 42 (4.0%) partograms. Among those partograms with records, 856 (81.4%) were substandard. Among the 70 new-born babies who had adverse fetal outcome 67 (95.7%) had substandard recordings of uterine contraction. With the p-value < 0.01 means that there is an association between substandard uterine contraction recordings in the partogram and adverse fetal outcome. Though there is a high proportion of substandard record of uterine contraction but is somehow better when compared to a study done in Brazil to evaluate the quality of care for normal delivery. In Brazil study they found that half of the women had no evaluation of uterine dynamics and 29% had no auscultation fetal monitoring[11].

Descent of the presenting part is another important parameter in labor monitoring. In this study we found 89 (8.5%) partograms with unrecorded descent of the head. About three fifths of the partograms had standard records of descent of head. Weak association between partogram recordings of descent and fetal outcome exist. (p-value =0.01)

In this study we found that all partograms had recordings of cervical dilatation though only 55.8% of them met the standard recordings. In this study cervical dilatation recordings in the partogram were found to have no significant association with fetal outcome. These findings concur with that found in the study done in Tanzania[13].

The condition of new-born baby is recorded in the partogram. Eighty nine new-borns were admitted in neonatal ward for special care. Among those admitted majority (59.5%) were due to Apgar score less than 7 at 5 minute but also abnormal breathing and meconium aspiration contributed 9 and 8newborns respectively. There were no details in the partogram concerning those babies who had abnormal breathing.

There were 17 91.6%) stillbirths among the reviewed partograms. In the reviewed partograms there were no details of these still births. Cord around the neck and thick meconium was the only detail found in some partograms of stillbirth.

Among the studied partograms, caesarean section was found to be 18.6%. All these were emergency caesarean sections. Although the majority of women had spontaneous vaginal deliveries, only 4 had immediate maternal adverse outcome compared with 16 who had caesarean delivery. Of all the deliveries whose partograms were reviewed, 22 women got complications. Majority (90.9%) of the partograms of those who succumbed complications were judged to be substandard. There is no significant association found between substandard partogram and immediate maternal adverse outcomes (P-value = 0.8615, Chi square = 0.030).

CONCLUSION

In this study it was found out that partogram were used in all women in labor at MNH. Though there were high prevalence of partogram use but most of them had substandard recordings of parameters of labor. Substandard fetal heart rate monitoring, uterine contractions and meconium stained liquor are significantly associated with Apgar score less than 7 at 5 minute and stillbirth. This means that association between quality of partogram recordings and perinatal outcomes does exist.

There is no association between quality of partogram recordings and immediate maternal outcomes.

RECOMMENDATION

There is a need for putting in place the supervisory mechanism as one way of improving intrapartum monitoring so as to reduce adverse fetal outcome. The use of simplified WHO partogram prototype is also recommended as another way forward. More efforts are needed to improve fetal outcome so as to make every pregnancy count.

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Appendix 1

Checklist

1. Check list number -------

2. In Patient number ---------

3. Age –-------

4. Gravidity ------

5. Parity ---------

6. Gestational age (weeks)---------

7. Time of admission ------Time of onset of labor ------- Time interval between labor onset and hospital admission ---------- Hours

8. Time of 1st pelvic assessment ---------- (Time between admission and 1st pelvic assessment ---------- Minutes

9. Cervical dilatation at 1st pelvic assessment ---------- Cm

10. Fetal part

10.1. Fetal heart rate

(0) Not recorded

(1) Standard

(2) Substandard

10.2 Membrane

(0) Not recorded

(1) Intact

(2) Ruptured

10.3. Liquor quality

(0) Not recorded

(1) Clear

(2) Meconium stained

10.4 Molding (1) Recorded

(2) Not recorded

11. Progress of labor

11.1 Cervical dilatation

(0) Not recorded

(1) Standard

(2) Substandard

11.2 Descent

(1) Not recorded

(2) Recorded

11.3 Uterine contractions

(0) Not recorded

(1) Standard

(2) Substandard

11.4 Any abnormality noted in cervical dilatation

(1) None

(2) Precipitated

(3) Protracted

(4) Arrest

11.5 Action taken

(1) None

(2) Augmentation with oxytocin

(3) Operative delivery

12. Maternal condition

12.1. Maternal Blood Pressure

(0) not recorded

(1) Standard

(2) Substandard

12.2. Maternal body temperature

(0) Not recorded

(1) Standard

(2) Substandard

12.3 Maternal pulse rate

(0) Not recorded

(1) Standard

(2) Substandard

12.4 Urine test

(1) Correctly recorded

(2) Half recorded

(3) Not recorded

13. Mode of delivery

(1) Spontaneous Vaginal delivery

(2) Assisted vaginal delivery

(3) Caesarean section

14. Fetal outcome

14.1 Apgar score at 1minute------- at 5 minute-------

14.2 Resuscitation done

(1)Yes

(2) No

14.3 Admitted neonatal ward for special care

(1) Yes

(2) No

14.4 If Yes, Reason

(1) Low Score

(2) Prematurity

(3) Low birth weight

(4) Others specify ----------

15. Immediate maternal outcome

(1) Good

(2) Adverse (Death, perineal tear, PPH, Visceral injury, Need blood transfusion)