Utilization of Partograph during Labour and Birth Outcomes at Jimma University

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Abstract

Background: Globally, at least 585,000 women die each year with complications of pregnancy and child birth. This high level of maternal morbidity and mortality has been remained as big challenge in developing countries and there is a woman who dies of pregnancy and birth related complication every minute passes. Majority of these deaths and complications could be prevented by cost-effective and affordable health interventions like utilization of partograph; a graphic representation of progress of labour, maternal and fetal conditions in relation to time. The aim of this study is to identify the extent of utilization of partograph and birth outcomes at Jimma University Specialized Hospital.

Methods and Materials: Cross sectional retrospective study which involved quantitative methods of data collection was employed from February to March 2012. A total of 340 delivery records were reviewed from 7 years records selected by systematic sampling method using pre-tested structured check list.

Results: Of 340 reviewed delivery records 274/340(80.6%) files had partograph attached. However; utilized in only 19 (6.9%) of the records and some of fetal, labour and maternal parameters were correctly documented in 10.5%.

Conclusion and Recommendation: Utilization of partograph and documentation of the key events were poor. Hence, relevant authorities have to facilitate its actual availability, develop a system for its routine utilization and efforts should be made to maintain a high index of its utilization.

Keywords: Partograph; Labour; Utilization of partograph; Jimma University Specialized Hospital

Abbreviations: ACOG: American College of Obstetricians and Gynecologists; ANC: Antenatal Care; BP: Blood Pressure; CEmOC: Comprehensive Emergency Obstetric Care; C/S: Cesarean Section; FHR: Fetal Heart Rate; FMC: Federal Medical Center; GA: Gestational Age; GNS: Garnering National Support; HEWs: Health Extension Workers; HSU: Health Service Utilization; IOES: Internal and Obstetrics Emergency Surgeon; IUFD: Intra Uterine Fetal Death; JU: Jimma University; JUSH: Jimma University Specialized Hospital; KAP: Knowledge Attitude Practice; MDs: Medical Doctors; MGDs: Millennium Development Goals; MNHP: Maternal and Neonatal Health Program; MOH: Ministry of Health; NDUTH: Niger Delta University Teaching Hospital, NGO: Non-Governmental Organization; PEN: Predisposing Enabling Need; PMTCT: Prevention of Mother To Child Transmission; PPH: Post-Partum Hemorrhage; SMDP: Safe Motherhood Demonstration Project; SNNP: Southern Nations, Nationalities and People; SVD: Spontaneous Vaginal Delivery; WHO: World Health Organization

Introduction

Globally, at least 585, 000 women die each year with complications of pregnancy and child birth [1]. This high level of maternal morbidity and mortality has been remained as big challenge in developing countries and there is a woman who dies of pregnancy and birth related complication every minute passes [2]. Majority of these deaths and complications could be prevented by cost-effective and affordable health interventions like utilization of partograph [3-6].

Partograph is a universal tool for monitoring progress of labour. It is a pre-printed paper form on which labour progress observations are recorded [7,8]. It was initially introduced by Philpot; and endorsed by WHO as simple and accurate instrument for early recognition of complications of labour [9]. It gained popularity since 1970's and today

most labor and delivery wards use it [8]. As many partographs have been developed that of WHO is arguably the most popular and serves as a standard both in developed and developing countries [1,2].

The aim of the partograph is to provide a pictorial overview of labour to alert care providers to deviations in labour progresses, maternal and fetal wellbeing [10-12]. If used effectively it helps to ensure careful monitoring of the woman in labour, avoids unnecessary interventions, recognizes and responds to complications in a timely manner all of which can help to prevent maternal and neonatal morbidity and mortality [13-16]. It also serves as an "early warning system" and a simple method valuable in preventing prolonged and obstructed labour, those are sources of many maternal deaths and disabilities such as infection, obstetric fistula and nerve injuries, as well as stillbirths, neonatal deaths due to asphyxia and long-term disabilities [16,17].

It is one of the most appropriate technologies in the developing world for intrapartum management and helps for easily identification of prolonged and/or obstructed labour, which accounts for about 8% of maternal deaths to know when to take appropriate actions that results in reduction of duration of labor by 3%, augmentation by 11%, PPH by 5%, assisted delivery by 0.9% and increase SVD by 2% [3,15-22].

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Even though the overall use of it in East African was very low, only 14% of the records of mothers monitored with partograph had correct documentation of the key events of labour [5].

Methods, Materials and Subjects

Facility based cross-sectional study design with both quantitative and qualitative methods of data collection was employed from February to March 2012 at Jimma University Specialized Hospital which is one of the oldest public hospitals established in 1937 as Jimma hospital, located in Jimma city 352 Kms South West of Addia Ababa. It is the only teaching and referral hospital in the South Western part of the country. It provides services for approximately 9000 inpatient and 80000 outpatient attendies a year coming from the catchment population of about 15,000 million people. The hospital has different departments those renders comprehensive health services by care providers from different departments and professional levels. Currently owing to the fast growing service and teaching role of the hospital, the construction of a new level best hospital which is basement started in 2008 [23,24].

The population for the study is all delivery records used at JUSH from January 2005 - December 2011. The study population were all selected 340 delivery records from 1st January 2005 - 31st December 2011 purposely based on endorsement of MDG in Ethiopian to assess the level of utilization of partograph.

The data was collected through record review using pre tested structured check lists. The procedure of data collection from records was: looking for the files, reviewing the files for presence of partograph in it and whether used or not, if partograph is not used checking for maternal identifications, birth outcomes and qualification of care provider who conducted the delivery and if used checking for maternal identifications, labour, fetal and maternal parameters, the standards of key events managements, birth outcomes, profession and qualification of care provider who conducted the delivery.

Prior to analysis, data cleaning, coding, checking for normality, completeness was done, then data was entried in to SPSS version 16.0. Descriptive statistics was computed to determine the proportion of utilization. Bivariate analysis (chi square test) was carried out between the dependant and independent variables to determine their association. Binary logistic regression analysis was made to obtain odds ratio and the CI for statistical association variables. And multivariable logistic regression analysis was carried out to assess strength of statistical association (AOR) of utilization of partograph with health care providers, maternal and health care facility related variables. The strength of statistical association was measured by adjusted odds ratios at 95% confidence intervals. Statistical significance is declared at $P<0.05$. Finally the result was presented using tables, figures and charts.

Results

The data were compiled from 340 records of mothers' delivered at the hospital. The results are presented under subheadings as follows.

Maternal characteristics

One hundred seventy nine (52.6%) of mothers were in age group between 15-24 years, 207(60.9%) were multiparous, 152 (44.7%) come to the hospital before 12 hours of onset of labour, 221(65.0%) were before rupture of membrane, 179(52.6%) had gestational age of less than or equals to 37 weeks and 57 (16.8%) had at least one bad obstetric history (Table 1).

Utilization of partograph and documentation of key parameters

Out of the total 340 reviewed maternal records, partograph was present in 274(80.6%) of the files but only utilized for 19/274 (6.9%) mothers. Also from care providers 29(38.2%) were reported its availability but concerning its utilization only 1(4.8%) of them said always. As to fetal, labour and maternal parameters; out of the 19 (6.9%) mothers for those in which partograph was used; FHR was monitored to standard in 3 (15.8%), states of membrane (liquor) was in 1 (5.3%) but in none of the cases the molding status of fetal head was monitored to standard; labour parameters (cervical dilation, station, uterine contractions, interval of contraction, and duration of contraction) were monitored to standard in 2(10.5%) of the cases and; alert and action line were crossed in 5(26.3%) and 3(15.8%) correspondingly but drugs and fluid given were piloted in 3(15.8%) of the records. Concerning the maternal parameters merely in 2(10.5%) pulse, BP and temperature

Mothers characteristics		N(n=340)	%
Maternal age	15-24years	179	52.6
	25-35years	129	37.9
	>35years	32	9.5
Parity	Primiparous	133	39.1
	Multiparous	207	60.9
Time of admission	Before 12hrs of onset of labour	152	44.7
	After 12hours of onset of labour and others(IUFD, Referred from ANC clinic ,Post term, False labour)	188	55.3
Status of membrane on admission	Intacted	221	65
	Ruptured	119	35
GA	≤ 37Weeks	179	52.6
	>37 Weeks	161	47.4
Bad obstetric history	Had	57	16.8
	No	283	83.2

Table 1: Distribution of mothers delivered at JUSH from Jan. 2005-31st Dec. 2011 by their maternal characteristics, JUSH, February -March 2012.

Birth outcome measures		N(n=340)	%
Birth outcome measures attached to the document	Present	313	92.1
	Absent	27	7.9
Maternal birth outcome indicators (n=313)		N(n=313)	%
Total rate of caesarian delivery	Yes	46	14.7
	No	267	85.3
Rate of augmentation	Yes	34	10.9
	NO	279	89.1
Rate of analgesia used	Yes	54	17.3
	No	259	82.7
Rate of PPH >500ml for VD or 1000ml for CS	Yes	12	3.8
	No	301	96.2
Rate of blood transfusion	Yes	15	4.8
	No	298	95.2
Rate of instrumental delivery	Yes	54	17.3
	No	259	82.7
Rate of duration of labour	<18hours	46	14.7
	≥ 18hours	27	8.6
	Not recorded	240	76.7
Rate of number of times vaginal examination done	≥ 4 times	2	0.6
	Not kwon	311	99.4
Fetal birth outcome indicators (n=313)		N(n=313)	Percent
APGAR scores at 5th minute	≥ 7	253	80.8
	<7	60	19.2
Rate of baby admitted to special nursery unit	Yes	44	14.1
	No	269	85.9
Rate of baby died during the first 6hours of delivery	Yes	24	7.7
	No	289	92.3

Note: Percentage were calculated out of the total 313 those had birth outcomes information

Table 2: Frequency of birth outcome among mothers delivered at JUSH from Jan.2005-31st Dec.2011, JUSH, and February–March 2012

were completed to standard and in 3(15.8%) urine test result was recorded As to the overall level of documentations of the parameters in majority 16 (84.2%) of the cases monitored to substandard.

Based on the number of normal deliveries conducted, utilization of partograph for them and level of documentation of the key events of labour, the utilization levels of the partograph were classified into good and poor. Accordingly none of the documents fit the good utilization level criteria since it was utilized only for 15/130(11.5%) of the normal deliveries conducted at the unit and in only 2(10.5%) some of the key parameters were monitored to standard.

Birth outcomes

Of the reviewed documents, 313 (92.1%) had birth outcome information attached to mothers 'documents. Of these 46(14.7%) were assisted and delivered by C/S, 34 (10.9%) augmented, for 54(17.3%) analgesia was provided, 12 (3.8%) developed PPH, for 15 (4.8%) blood transfused, 54(17.3%) delivered by instrumental delivery, in 27 (8.6%) of cases duration of labour was greater than /equals to 18hours and in

2(0.6%) of the case the number of time the vaginal examination done was greater than or equals to four times.

Regarding to the fetal outcomes in 253 (80.0%) of the cases APGAR scores at 5th minuet was greater than or equals to seven, 44 (14.1%) were admitted to special nursery unit and 24(7.7 %) died during the first 6hours of delivery (Table 2).

Nature of occurrence of birth outcome indicators and birth outcome levels

The birth outcome measures were further evaluated to see the nature of occurrence of outcomes. Accordingly only 130/313 (41.5%) were normal spontaneous vaginal delivery. As to the level of birth outcomes 130(41.5%) indicated good birth outcome and 183 (58.5%) were poor birth outcome.

Association between dependant and independent variables

Dependant and independent variables were cross tabulated with each maternal characteristics related factors and use of partograph.

There were no significant statistical associations observed between utilization of partograph and maternal age, parity, gestational age, bad obstetric history.

On contrary there were significant statistical association (p<0.05) between utilization of partograph with time of admission to the hospital (χ2=4.137, p=0.042), nature of membrane on admission (χ2=6.897, p=0.009). Bivariate logistic regression analysis shows mothers admitted after 12 hours of onset of labour were 2.723 times less likely to be monitored with partograph UOR of 2.723 and mothers admitted before rupture of membrane were 9.48 times more likely to monitor with partograph UOR of 9.48. However; multi-variate logistic regression showed only those mothers admitted before rupture of membrane were 8.090 times more likely to monitored with partograph than those after rupture of membrane [AOR (95% CI)=8.090(1.072,61.041)].

There were no significant statistical associations (p<0.05) observed between partograph use with caesarean section, augmentation of labour, use of analgesia, occurrences of PPH, blood transfusion, number of babies admitted to special nursery unit and number of babies died during the first 6hours of delivery maternal.

On contrary there were significant association between instrumental delivery (χ2=4.164, p=0.041), duration of labour (χ2=60.849, p=0.000), number of time the vaginal examination done (χ2 = 25.874, p=0.000), APGAR scores at 5th minute (χ2=4.754, p=0.029) with utilization of partograph and utilization of partograph with birth out comes levels (χ2 =14.403, p=0.000). Bivariate logistic regression analysis shows mothers whose duration of labour was less than 18hours were 5.79 times more likely to monitor with partograph UOR of 5.79 and mothers monitored with partograph were 8.276 times more likely to have good birth out comes UOR of 8.276. However; in multi-variate logistic regression showed mothers whose duration of labour was less than 18hours were 34.9% times more likely to be monitored with partograph [AOR (95% CI)=0.349(0.190,0.641)] and mothers monitored with partograph were 41.564 times more likely to have good birth out comes [AOR (95% CI)=41.564(7.76,222.66)] (Table 3).

Discussion

The partograph is a tool that has been recommended by WHO and other authorities in maternal health for routine monitoring of labour to provide early warning system [25].

From this study, the utilization of partograph was very poor as only 19/274 (6.9%) of mothers were monitored with it, while 274 (80.6%) had a partograph in their file. Surprisingly only in 2(10.53%) of the records of the mothers' monitored with it had correct documentation of some of the key events which indicates poor monitoring of the key events against standards and of the utilized partograph none of them fits the criteria for good utilization.

This finding was not constant with what has been observed in Kenya Kakamega province hospital where its utilization was very low and 24% of the records of the mothers' monitored with it had correct documentation of the key events, while 88.2% had a partograph in their files (56), in eight Ecuador hospitals where in 17.7% of the records of the mothers' had documentation of the key events but only 5.4% correctly graphed, in Nigeria, Bangladesh, East African where the utilization was 24(8.7%), 6%, 14% respectively, in South Africa where utilization was 69.9% but that to the standard was only 2% and in Ethiopia 312/666 women were arrived before fully dilation and for about 90% ((85(12.8%)) partograph used and about 80% of the key events completed correctly [22,26-28].

The likely explanations for this dissimilarity might be difference in sample size, hospital policies, set up, study subjects, negligency of care providers, operationalisation of utilization and correct documentation. Also this could be supported by the study conducted in eight Ecuador hospitals indicated as there was a difference in utilization level of partograph not only among countries but also among types of health facility [27].

In this study the factors that have been indicated as predictors for the low utilization of partograph were: none availability of partograph as reported by more than three fifth (61.8%), staff shortage, lack of protocol, attitude of care providers, time of admission of mothers for delivery, lack of controlling system and availability of other modern tools.

In this study, the overall birth outcome was poor as 183 (58.5%) of the mothers had at least one of the poor birth outcome indicators.

Factors/Variables		COR(95%CI)	P	AOR(95%CI)	P
Time of admission and onset of labour	After 12hourrs	1			
	and others				
	Before 12hours	2.723(1.003, 7.389)	0.049	8.128(.883, 74.843)	0.064
Membrane on admission	Ruptured	1			
	Intacted	9.485(1.246, 72.231)	0.03	8.090(1.072, 61.041)	0.043
Duration of labour	≥ 18hours	1			
	< 18hourrs	5.786(3.025, 11.066)	0	0.349(0.190, 0.641)	0.001
Use of partograph and birth out come	Not used	1			
	Used	8.276(2.329, 29.406)	0.001	41.564(7.759,222.659)	0

NB: These variables are from the total variables statistical significant while cross tabulation done (p<0.05) (time of admission, nature of membrane on admission, prior training, attitude of care providers, availability partograph, specialty of health care providers, instrumental delivery, duration of labour, number of time the vaginal examination done, APGAR scores at 5th minute and utilization of partograph with birth out comes levels)

Table 3: Bivariate and multivariate logistic regression model showing predictors of utilization of partograph, utilization and birth outcomes among delivery conducted from Jan. 2005- Dec. 2011 and care givers at JUSH, February – March 2012

This was not consistent with the findings of the study in Jinnah Postgraduate Medical Center; Harvard university medical science hospital, Karachi in which 88% had normal vaginal delivery, 21 (72.4%) had combination [2].

The possible explanations for this contrast might be due to variation in study setup, health care providers believes, awareness of health, guideline on child birth and delivery, training, availability of modern tools and disparity in judging birth outcome as good or poor.

This study further revealed the association between utilization of partograph with birth outcome and there was significant statistical association observed between them where mothers monitored with partograph were 41.564 times more likely to have good birth out comes [AOR (95% CI) = 41.564(7.76,222.66)].

This result was similar with what had been observed in Iran at medical science university hospitals, Nigeria, East African countries, Pakistan, India as appropriate partograph utilization prevents more than 85% infection because of repeated vaginal examinations which results in maternal deaths and reduces prolonged labor from 6.4% to 3.4%, need for augmentation 20.7% to 9.1%, cesarean delivery 9.9% to 8.3%, and stillbirth 0.5% to 0.3%, operative vaginal delivery, neonatal outcome (perinatal mortality) decreased from 3.6% to 0.8% after its utilization and number of babies need resuscitation with Apgar score less than 6 dropped from, 48 (9.6%) to 21 (4.2%) [16, 29-31, 33-35].

This cross-sectional study has possible limitations that may arise from care providers readiness and ability to record every information about the mothers delivered at hospital correctly based on which birth outcome measured. However; measure has been taken to minimize these limitations were using check list targeted information specifically on utilization of partograph.

Conclusion

Based on the finding of the study we have made concluded as utilization of the partograph during labour, documentation of the key events of labour and birth outcomes poor. The significant predictors of utilization of partograph were: time of admission, nature of membrane on admission. There was significant association (p<0.05) between utilization of partograph and overall birth out comes.

References

1. Ogwang S, Karyabakabo Z, Rutebemberwa E (2008) Partogram use during labour in Rujumbura Health Sub District, Uganda. Afr Health Sci 1: 27-34.

2. Javed I, Bhutta S, Shoaib T (2007) Role of Partogram in preventing prolonged labour. J Pak Med Assoc, Karachi 57: 408-411.

3. JHPIEGO (2002) The partograph: an essential tool for decision-making during labor. Best practice MNH Program. Ethiopia.

4. Fawole AO, Hunyinbo KI, Adekanle DA (2008) Knowledge and utilization of the partograph among obstetric care givers in south west Nigeria. Afr J Reprod Health 12: 22-29.

5. World Health Organization, UNFPA, UNICEF, The World Bank (1999) Reduction of Maternal Mortality. Geneva.

6. Lewis G (2003) Beyond the numbers: reviewing maternal deaths and complications to make pregnancy safer. Br Med Bull 67: 27-37.

7. Kwawukume EY (2002) The partogram in comprehensive Obstetrics in the Tropics. Ghana: Asante and Hittscher Press.

8. Lavender T, Alfirevic Z, Walkinshaw S (2006) Effect of different partogram action lines on birth outcomes: a randomized controlled trial. Obstet Gynecol 108: 295-302.

9. Philpot RH, Castle WM (1972) Cervicographs in the management of labour in primigravidae. Obstet Gynaecol. Br Commonw 79: 592-598.

10. World Health Organization (1994) "Division of Family Health. Maternal Health and Safe Motherhood Programme: Preventing prolonged labour a practical guide part I" 93: 8.

11. Ali A, Masakhwe BA (2010) Managing prolonged and obstructed labour. Geneva.

12. WHO (1994) Preventing Prolonged Labour: Practical guide part II. Geneva.

13. Nausheen S1, Jalil S, Anwer T, Akhter AZ (2010) Assessment of improvement in knowledge and skills amongst trainees of workshop on "labour and partograph". J Pak Med Assoc 60: 844-848.

14. Hill S (2009) Emergency obstetric care: Clinical skills training for doctors. Volta region.

15. Orji E (2008) Evaluating progress of labor in nullipara and multiparas using the modified WHO partograph. Int J Gynaecol Obstet 102: 249-252.

16. Javed I, Bhutta S, Shoaib T (2007) Role of partogram in preventing prolonged labour. J Pak Med Assoc 57: 408-411.

17. Ministry of health (2004) Division of reproductive health and UNFPA needs assessment of obstetric fistula final report, Kenya.

18. Ernest O, Adesegun AF, Niyi OM, Babalola AA, Uche OE (2007) "Impact of training on the use of partograph on maternal and perinatal outcome in peripheral Health Centers." J Turkish-German Gynecol Assoc, V Asso 8: 148-152.

19. Ndavi P, Muia E, Liambila W, Waweru N (2003) Monitoring Labour: Quality of care and the partograph. Safe Motherhood. University of Nairobi. Kenya.

20. AO Fawole, DA Adekanle, KI Hunyinbo (2010) Utilization of the Partograph in Primary Health Care Facilities in southwestern Nigeria. Nigerian journal of clinical practice 13: 200-204.

21. Nyamtema AS, Urassa DP, Massawe S, Massawe A, Lindmark G, et al. (2008) Partogram use in the Dar es Salaam perinatal care study. Int J Gynaecol Obstet 100: 37-40.

22. Mugerwa, KY and Others (2008) Regional Centre for Quality of Health Care. African Midwives Research Network. East Africa. Kenya.

23. (2003) Maternal and Neonatal Program, Effort Index Service capacity of health centres and district hospitals in Ethiopia.

24. http://www.ju.edu.et/node/94

25. Fawole AO, Hunyinbo KI, Adekanle DA (2008) Knowledge and utilization of the partograph among obstetric care givers in south west Nigeria. Afr J Reprod Health 12: 22-29.

26. Kwast BE, Rochat RW, Kidane-Mariam W (1986) Maternal mortality in Addis Ababa, Ethiopia. Stud Fam Plann 17: 288-301.

27. Bart Burkhalter, Wendy Edson, Steven Harvey, Maina Boucar, Sabou Djibrina, et al. (2006) Quality of obstetric care in 14 hospitals. Benin, Ecuador, Jamaica, and Rwanda; United States Agency for International Development 1-30.

28. Justus GH (2008) Intrapartum-related deaths. South Africa 102: 249-252

29. Mathews JE, Rajaratnam A, George A, Mathai M (2007) Comparison of two World Health Organization partographs. Int J Gynaecol Obstet 96: 147-150.

30. van Bogaert LJ (2004) The multigravid partogram--should it be customised? J Obstet Gynaecol 24: 881-885.

31. Oladapo OT, Daniel OJ, Olatunji AO (2006) Knowledge and use of the partograph among healthcare personnel at the peripheral maternity centres in Nigeria. J Obstet Gynaecol 26: 538-541.

32. Massawe SN (2002) Training of maternity care providers in regional hospital: Tanzania.

33. World Health Organization (2007) Effect of partogram on perinatal and maternal morbidity and mortality. Wiley online Library.

34. Simbar M, Ghafari F, Zahrani ST, Majd HA (2009) Assessment of quality of midwifery care in labour and delivery wards of selected kordestan medical science university hospitals. Int J Health Care Qual Assur 22: 266-277.

35. Mercer W Stewar (2006) Using clinical audit to improve the quality of obstetric care. Tibetan Delek Hospital in North India 3: 3-9.