

Original Research Article

A comparative study of 4-hour versus 2-hour action line on who modified partograph

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ABSTRACT

Background: World health organization has promoted modified partograph with action line, 4 hour to left of alert line. While others have used various action line 2, 3, or 4 hours to initiate and guide “active management” decisions. Objectives of the study were to evaluate outcome of labour in terms of caesarean section rate, augmentation of labour and fetal outcome in whom labour has been managed with 4-hour vs 2-hour action line on WHO modified partograph. **Methods:** This was a randomized, prospective, comparative study. Primigravida, 19-28 years, with single live foetus in vertex presentation without any medical and obstetrical complications, at term pregnancy have been included in the study. Results were compared between Group A, with 100 cases, in whom labour has been managed with WHO modified Partograph with 4-hour action line and Group B, with 100 cases, in whom labour has been managed with that of 2-hour action line.

Results: The present study shows that more women in 2-hour arm crossed the action line, compared with the 4-hour arm, and therefore received more interventions to augment labour. Rate of caesarean section is more in group B (11%) than in group A (9%) which is statistically nonsignificant.

Conclusions: Neonatal outcome measured with APGAR score at 5 minute, has shown no significant difference in both groups. Therefore, partograph with 2-hour action line doesn't show any superiority over that of 4-hour action line but to be associated with higher incidence of intervention. Further research is required in this field of active management.

Keywords: 2-Hour action line, 4-Hour action line, Partograph, WHO modified partograph

INTRODUCTION

Partography is a novel concept in which all the events are depicted with a graphical representation. As a part of safe motherhood initiative launched in 1987, World health organization has produced and promoted a Partograph.¹ Partograph is a preprinted document which gives pictorial overview of labour with maternal and fetal well-being.² A prospective nonrandomized study was done by World health organization in 1994, showed reduced incidence of prolonged labour, caesarean section,

proportion of labour, requiring augmentation and concluded that the partograph is a necessary tool in management of labour and recommended its universal application.³

Problems encountered with routine practice of WHO original Partograph, were associated with increased referrals to tertiary care centre and increased rate of caesarean section due to prolonged labour. Thus, World health organization, in year 2000 has introduced modified partograph by removing the latent phase and assessment

has been started with active phase of labour.⁴ WHO Modified partograph includes cervicograph, maternal condition i.e. pulse, blood pressure, temperature, urine analysis and fetal heart rate, uterine contractions. Cervicograph, the most important component of partograph includes action line and alert line. An action line allows unambiguous diagnosis of prolonged Labour. It is conventionally placed a number of hours to the right of alert line⁵, which describes the rate of cervical dilatation of the slowest 10% of primigravidae.⁶

The timing of intrapartum interventions which may correct prolonged labour, include amnio- tomy, intravenous hydration, analgesia, oxytocic infusion and operative delivery⁷ has not been subjected to rigorous evaluation.⁷

Philpott and Castle, who were the first to provide specific guidelines on the timing of intervention for prolonged labour, recommended an action line 4 hours to the right of the alert line.⁸ This recommendation was to enable adequate time to transfer women from peripheral units to a central unit when labour became prolonged. The Dublin group have proposed that an active management package which relies on early identification of prolonged labour with early correction by oxytocin reduces caesarean section rate.^{9,10} However, as the evidence to support either a 2 or 4-hour action line was inconclusive in 1992, a consensus was reached among senior medical and midwifery staff at the Liverpool Women's Hospital that the partogram in Liverpool would contain a 3-hour action line. This adaptation to the WHO partogram has been used by others who believe that partograms have not been sufficiently evaluated.¹¹

Therefore we carried out a randomized control trial to evaluate outcome of labour in terms of rate of caesarean section, need of augmentation of labour and fetal outcome in primigravid women in whom labour has been managed with 4-hour vs 2-hour action line on WHO modified partograph.

METHODS

The present study was a prospective hospital based randomized study. The study was carried out in the department of Obstetrics and Gynecology, Gauhati medical college and hospital, Guwahati, Assam, India. The study was approved by ethical committee of the institution.

A total number of 200 primigravid cases admitted in labour room were divided equally into two groups i.e. group A and group B. In group A labour was monitored with 4-hour action line on WHO modified partograph, while in group B the whole duration of labour was monitored with 2-hour action line on the partograph. Labouring mothers were admitted to the hospital after taking full history and examination and all were sent for haemoglobin level, blood group and RH typing, random

blood sugar, general urine examination and ultra sound. Inclusion criteria: primigravida, aged 19 to 29 at term (had crossed 37 weeks of gestation) with singleton live, term, cephalic presentation, uncomplicated pregnancy in spontaneous labour.

Exclusion criteria

Multipara, short stature <140 cm, teenage pregnancy, elderly primigravida, multiple pregnancy, malpresentation, post-caesarean pregnancy, post term pregnancy, preterm labour, oligohydroamnios, intrauterine death, associated medical complications like diabetes, essential hypertension, heart disease, anaemia, associated obstetrical complications like APH, placenta previa, pre-eclampsia/eclampsia.

Recording of labour on WHO modified partograph were started only in active phase of labour. According to guidelines of WHO modified partograph, active phase has been considered at 4 centimeters of cervical dilatation.

The management of labouring women in both groups was unaffected if labour followed the expected rate of progress. However, if cervical dilatation crossed the allocated action line, a clinical assessment was made and guidelines for the management of prolonged labour were followed. Where augmentation was required, this involved oxytocin alone when membranes were ruptured or amniotomy followed by oxytocin in the presence of intact membranes. The oxytocin infusion rate commenced at 2mU/min and was doubled every 30 minutes until effective regular uterine contractions were achieved, the maximum rate of syntocinon being 32mU/min.

Outcome measures, were duration of labour, need for augmentation, caesarean section rate postpartum haemorrhage, fetal outcome in terms of Apgar score and admission to NICU.

Statistical analysis

The results were expressed as mean and standard deviation. The statistical differences between cases and controls were determined by Fisher exact test (two-tailed). Data analysis was performed with the Statistical package for social sciences software 21.0 version (SPSS, Chicago, Illinois, USA). p value<0.05 was considered as significant.

RESULTS

According to present study, more women in the 2-hour arm (52%) crossed the partogram action line, compared with the 4-hour arm (38%) as shown in Table 1, and therefore received more interventions to augment labour in the form of either artificial rupture of membranes or augmentation with oxytocin, shown in Table 2.

Table 1: Cases in which action line crossed and need augmentation of labour.

	Group A (4-hour action line) 100 cases	Group B (2-hour action line) 100 cases	P value
Action line crossed	38	52	0.06 (NS)
Augmentation of labour	36	48	0.11 (NS)

NS: non-significant.

Table 2: Modes of augmentation of labour in both groups.

	Group A (4-hour action line) 36 cases	Group B (2-hour action line) 48 cases
With artificial rupture of membrane	29	19
With oxytocin	7	29

Rate of caesarean section is more in group B i.e. 2-hour action line (11%) than in group A, 4-hour action line (9%), as shown in Table 3, however the difference is statistically nonsignificant.

Table 3: Mode of delivery.

Mode of delivery	Group A (4-hour action line) 100 cases	Group B (2-hour action line) 100 cases	P value
Spontaneous vaginal delivery	83	80	
Caesarean section	9	11	0.71 (NS)
Instrumental delivery	8	9	

NS: nonsignificant.

Table 4: Neonatal outcome with APGAR score at 5 minutes.

APGAR score at 5 minutes	Group A (4-hour action line) 100 cases	Group B (2-hour action line) 100 cases
Less than 7	4	6
More than 7	96	94
NICU admission	3	4

Neonatal outcome recoded with APGAR score at 5 minute, has shown no significant difference in both groups as shown in Table 4.

DISCUSSION

Although partograms are in widespread use, little research has been undertaken in the form of randomized trials to assess the efficacy of different placement of the action line. As there is little evidence of what makes a labour dysfunctional and no universal consensus for the best time to intervene dysfunctional labour, the debate between active and expectant management of prolonged labour continues. In present study 52% of women crossed action line in group B as compared to 38% in group A which is comparable with the study of Lavender et al with OR 1.6, 95% CI 1.1-2.2.

Caesarean section rate was found more in partograph with 2-hour action line than in partograph with 4-hour action line which is comparable to following studies: Lavender et al reported rate of caesarean section in partograph with 2-hours action line was 11.1% (CI 8%-15.2%) than 8.3% (CI 5.6%-12.2%) in 4-hour action line.¹² Pilot study, done on 1500 women detected 3% difference (8% in 4-hour action line vs 11% in 2-hour action line), in caesarean section rate with 80% power (alpha 0.05).¹³ All other outcomes showed no statistically significant differences among two groups of the present study.

CONCLUSION

From this study, we concluded that there were non-significant changes in 2-hour action line over 4-hour action line on partograph. The present study is unable to prove superiority of 2-hour action line over 4-hour action line on partograph. However, it is possible that partograms which favor earlier intervention are associated with higher caesarean section rate.

As the evidence on which choices of partograms are based, remains inconclusive and further research is required.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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