TO STUDY THE ROLE OF MODIFIED WHO PARTOGRAM AS AN ANALYTIC TOOL FOR PROGRESS OF LABOUR IN TERM PREGNANCY

By

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ABSTRACT

INTRODUCTION:

Labour is a physiologic and continuous process. Although majority of labour do occur spontaneously, a handful of these may land up in dystocia subsequently causing prolonged labour. Therefore it is imperative to recognize the abnormality at the earliest so as to deliver them safely in time.

The partogram plays a pivotal role in diagnosing prolonged labour and as such has become an integral part of labour management in many units. It is cheap, minimally-invasive intervention, simple and easy to use tool based on the rate at which cervix dilates and descent of the fetus after labour has entered active stage. The crucial factor is determining is the time at which interventions like amniotomy, oxytocin augmentation, need for referral to higher centre or need for instrumental and caesarean delivery ought to be taken when active phase has entered. For managing active phase. Partogram plays a key tool in indicating optimum time for such interventions. It helps in recognizing cephalopelvic disproportion prior labour becomes obstructed. Modified WHO partogram is considered as valuable tool for the upgrading of maternity care by allowing obstetricians to record intrapartum details pictorially. Also it rules out many cases of prolonged labour as it takes 4 cm dilatation as active labour.

OBJECTIVES:

1. To determine the effect of use of partogram on the frequency of prolonged labour, augmented labour, operative deliveries and intervention based on partogram.

2. To evaluate maternal and perinatal outcome in normal and abnormal Labour.

STUDY DESIGN: A prospective observational study

MATERIALS AND METHODS:

A total of 351 pregnant women fulfilling the inclusion criteria were analyzed.

The following study is a prospective study which was conducted at R.L Jalappa Hospital and Research Centre attached to Sri Devaraj Urs Medical College, Department of Obstetrics and Gynecology, Tamaka, Kolar-563101 during June 2017– August 2018. It included 215 primigravid and 136 multigravid women within the inclusion criteria using the WHO-modified partogram. The details of labour were plotted when the woman entered into active phase of labour, i.e. when cervix was 4 cm dilated. The modified WHO partogram was to plot intrapartum events.

RESULTS:

Maximum number of deliveries were FTND, i.e.78.92 %, outlet forceps 5.70 %, vacuum 5.41 % and LSCS rate was 9.97%. This study showed 75(21.37%) women out of 351 women had labour abnormalities. 78.63% of women progressed normally.

Out of 351 total women, 289 (82.34%) women delivered when partogram was within alert line (Group I).In Group II 30 (8.55%) patients delivered and 32 (9.12%) delivered in Group III.

In group I there were 276 (95.5%) women delivered vaginally. Forceps was used in 2 (0.69%) and ventose was applied in 6 (2.08%) cases. Cesarean delivery was done in 5 (1.73%). In group II there was 1 (3.33%) women delivered vaginally. 15 (50%) women had outlet forceps, 11 (36.67%) ventose and 3(10%) underwent cesarean delivery. In group III, 3

(9.38%) women had outlet forceps delivery, 2 (6.25% had ventose and 27 (84.38%) underwent cesarean delivery.

In this study of 75 cases had abnormal labour, the various abnormal labour patterns observed were: protracted descent 20 (26.67%), protracted dilatation 5 (6.67%), arrest of descent 13 (17.33%) secondary arrest of dilatation 4 (5.33%) and failure of descent 1 (1.33%). 32 (42.67%) babies had fetal distress on intrapartum electronic fetal monitoring. Protracted descent was the most common abnormality.

There were 6 (2.07%) women in group I, 5 (16.66%) in group II and 4 (12.5%) in group III who had maternal complications.

In current study more neonatal morbidity was found in group II (56.66%) and group III (40.62%) in comparison to group I (4.15%). NICU admission was also found to be more in group II and III than in group I.

CONCLUSION: The use of modified WHO partograph with continuous pictorial overview of progress of labour with alert and action lines increases the quality and regularity of observations on mother and fetus during labour. It helps in early identification of abnormal progress of labour and initiation of early and effective intervention thereby preventing problems of prolonged labour. Modified WHO partograph is a safe, simple, inexpensive, valuable tool that significantly reduces the maternal and fetal adverse outcome.

Keywords: Dystocia, Partogram

LIST OF ABBREVIATIONS

APGAR	-	Appearance, Pulse, Grimmace, Activity, Respiratory effort
CPD	-	Cephalopelvic Disproportion
Cx	-	Cervix
FHR	-	Fetal Heart Rate
FTND	-	Full Term Normal Delivery
LMP	-	Last Menstrual Period
mIU/min	-	milli International Unit / minute
POG	-	Period Of Gestation
PPH	-	Post-Partum Haemorrhage
WHO	-	World Health Organization
MAS	-	Meconium aspiration syndrome

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Introduction

INTRODUCTION

Pregnancy-related complications are most common cause of maternal mortality and its incidence is high in developing countries. In India the present maternal mortality ratio is 178 deaths per lakh live births. Timely and informed labour monitoring by a skilled birth attendant act as a determining part in averting considerable causes of maternal death- haemorrhage, sepsis, obstructed and prolonged labour.

Although labour is a natural physiological process characterized by progressive increase in the frequency, intensity and duration of uterine contractions, resulting in effacement and dilation of the cervix with progressive descent of the fetus through the birth canal, this physiological process might turn into pathological one if not found out at proper time and may lead to complications of prolonged labour with the substantial increase in morbidity and mortality of both mother and the fetus.

It is important to detect prolonged labour as individually postpartum hemorrhage and sepsis are very common in prolonged labour beyond 18-24 hours. In most countries it is routinely used in the labour management especially in developing countries. Assessment of its efficacy henceforth is essential. Partograph graphically records the progress of labour on a single sheet of paper providing vital information about the maternal and fetal wellbeing. This can be helpful in detecting abnormal labour in early stages documenting the prime events and can be helpful in making decision in management.

Partographs when used with defined management protocols is an economical tool which can efficaciously monitor labour and be beneficial in reducing incidence of both maternal and fetal morbidity and mortality by reducing the number of operative interventions, prolonged

labour, obstructed labour and caesarean section. WHO advocated its use as important tool in labour management and suggested its universal use during labour.

The modified WHO partograph takes into accounts various parameters to assess progress of labour, condition of mother and fetus while in labour, and individual parameters are plotted graphically partograph paper. The plotting of latent phase has been omitted in W.H.O. modified partograph and it begins at 4 cm when patient enters in active phase instead of 3 cm cervical dilatation as in previous partograph. The use of modified WHO partograph has shown to significantly improve fetomaternal outcome in developing countries.

This study was undertaken in our hospital to evaluate the efficacy of modified WHO partograph in preventing dystosia and determining fetomaternal outcome in the rural population.

Objectives

OBJECTIVES

1. To determine the effect of use of partograph on the frequency of prolonged labour, augmented labour, operative deliveries and intervention based on partograph.

2. To evaluate maternal and perinatal outcome in normal and abnormal Labour.

Review of Literature

NEED FOR STUDY

Every day, 1500 women die from pregnancy or childbirth related complications. Globally nearly half a million women do not survive due to unmonitored labour complication. Around 99% of these cases are in developing countries. A women's lifetime risk of intranatal death is 1 in 7300 in developed countries versus 1 in 75 in developing countries [1]. This can be effectively averted by partograph, of every woman in labour.

The Partograph has been used since 1970 to detect labour which is not progressing at normal rate. Modified WHO partograph is an inexpensive, accessible, non-cumbersome tool which was introduced to monitor labour, decrease the incidence of prolonged labour, and reduce maternal and fetal mortality rate and operative interference.

It is a pre-printed paper form for recording labour progression aimed to provide a pictorial overview of labour. It is used by obstetricians & midwives helps them in detecting deviations in labour progress early besides providing maternal or fetal conditions. Partograph has pre-printed alert and action lines. An alert line represents the slowest 10% of primigravid women's labour progress. Four hours after the alert line an action line is placed to prompt effective management of dysfunctional labour before the problems of prolonged labour arise and increased operative interventions are compounded.

Detection of prolonged labour is important as both postpartum hemorrhage and infection are more common in women with long labour [2]. These risks more pronounced in developing countries who have poorly-resourced health services.

A prospective nonrandomised study done by WHO in 1994 of 35,484 women in South East Asia, concluded that the partograph constituted a vital tool in labour management and

recommended its universal application, introduction of the partograph, and agreed management protocol [3].

Various studies found that caesarean section rates were definitely lower in woman where the partograph without a latent phase was used than the partograph that had a latent phase [4]. Studies were done to assess partograph impact on mortality on fetus and mother in which results showed introduction of partograph reduces the labour to delivery time, and was helpful in timely decision besides improving follow up care. Hence using partograph was quintessential.

Considering the limitations in the existing trials, it has been suggested that future studies should incorporate both primigravid and multigravid women, as in most units which use the partograph, the same chart is used irrespective of parity. Any future trials should be stratified and participants should be grouped according to parity, the resource availability and the perinatal mortality. This clarity would also allow for more accurate comparability, both clinically, and also between trials for the purposes of systematic review by meta-analysis, allowing for more robust conclusions and it recommendations.

According to Cochrane data base review done in 2009, it showed that the women developing countries had limited access to health care facilities and as such the maternal and fetal morbidity and mortality was high [5]. The incidence of prolonged labour increased in these low resource setting. Therefore, greater need for evaluation of its usefulness in active management of labour in addition to detecting any deviation from normal labour.

Fewer studies are there regarding usefulness of partograph considering both multigravida and primigravida. Hence the need for this study was undertaken in this hospital with the aim to evaluate the efficacy and the utility of the WHO modified partograph and its role considering

both primigravid and multigravid women in detecting dystocia and fetomaternal outcome in population of Kolar, Karnataka.

HISTORICAL ASPECTS

More than 100 years ago, the normal physiologic process of birth began to be moved to hospitals. Although these initial moves were likely not specifically designed to improve pregnancy outcome, it has led to dramatic reductions in both the maternal and neonatal mortality rates.

The shift from home to hospital births following the Peel report (1970) led to a philosophy of childbirth that only recognised labour as being normal in retrospect [6]. Following his report maternity care was centralised in large obstetric units with a corresponding increase in obstetric intervention in pregnancy and childbirth.

Taylor & Bush (1978) and Sweet (1988) gave universal definition labour is that it is the process by which the fetus and placenta are expelled from the uterus [7, 8]. Dr Emmanual Friedman prospectively studied the labour and delivery process and reported out labour norms. The first obstetrician to provide a realistic tool for the study labour in each parturients was Emanuel Friedman (1954)[9]. He first gave developed and popularised "graphicostatistical analysis" of labour. Philpott et al., (1972) partograph developed from the original cervicograph of Friedman's, providing a practical tool for recording intrapartum details [10].

Philpott & Castle (1972) introduced the Alert line followed by the action line which is drawn to the right of the alert line four hour apart [11]. Friedman (1954) believed a latent phase of 20 hours for primigravida to be prolonged labour [12]. Cardozo, Gibb, Studd Vasant and Cooper (1982) considered an interval greater than six hours to indicate prolongation [16]

O' Driscoll et al., (1973) introduced the concept of an Active Management of labour as a solution to prolonged labour. He also named his approach as "*The Dublin Approach"* as caesarean rate declined due to intervention [14].

World Health Organization (1994) suggested an interval of greater than 8 hours [15]. Studd et al., (1973) devised and introduced a stencil to aid in the correct plotting of progress on the partograph [16]. The partograph was designed by world health organization for the use in developing countries (Dujardin and coworkers, 1992)[17].

The WHO partograph is an adaptation of the one formulated and described by Philpott and Castle (1972a, b) introduced in 1994 [10, 11]. Modified WHO partograph was introduced in 2000[18].

REVIEW OF LITERATURE

Bhatt, M.J. et al., (2018) carried out study comparing normal and abnormal labour by using Modified WHO Partograph. The study was done on 200 women and concluded that routine use of modified WHO partograph aids in detection of abnormal course in labour at early stage. Hence emphasizing on the fact that every parturient must be benefitted by use of modified WHO partograph for labour monitoring as it assures best maternal and perinatal outcome [19, 18].

Singh, A. et al., (2018) studied on progress of labour and maternofetal outcome among spontaneous versus induced labour using modified WHO Partograph in nulliparous women [20]. There comparative study involved nulliparous women with the cervix at least 4cm dilated i.e active phase. Comparative study was done between induced and spontaneous labour and both groups were monitored using modified WHO partograph. They concluded that although women with induced labour might have higher rate of caesarean section, but it does not adversely affect the neonatal outcome. Therefore, found induction as a safe procedure among nulliparous women if labour is partographically monitored using WHO modified partograph.

Nivedita, D. et al., (2018) did study on role of modified WHO partograph in primigravida in labour. 100 cases were compared. They found out that active management of labour significantly reduces the mean duration of all stages of labour in addition to total duration, but does not decrease the rate of the caesarean section [21].

Urmila, M. et al., (2016) studied use of modified WHO partograph to find labour progression and fetomaternal outcome. It was a prospective case controlled study conducted on 200 women. This Study showed that using the partograph is very effective in decreasing fetomaternal complication of labour as it aids in early recognition of protracted labour, hence

early intervention can be taken. Hence partograph implementation should be a part of standard labour management protocol in all hospitals [22].

Meena, R. et al., (2016) used modified WHO partograph to evaluate outcome of labour monitored by WHO modified partograph and latent phase Partograph on 300 women and came to conclusion that WHO modified partograph improves management of labour, reducing fetomaternal morbidity/ mortality and also allows timely intervention as compared to previously popular latent phase partograph, thus recommending its usage in every maternity units [23].

Patel, O. et al., (2016) studied spontaneous versus induced labour using modified WHO Partograph in nulliparous women. Progress of labour and also delivery outcome were analyzed and came to a consensus that induced labour if partographically monitored can be a safe procedure among nulliparous women [24].

Similar study was done by Yadav, P. et al., (2016) comparing spontaneous vs induced labour done on 120 pregnant nulliparous women with the aid of modified WHO Partograph. They found that although augmentation requirement was more in induced group and rate of caesarean delivery was also high but it does not adversely hamper the neonatal outcome and maternal complication if labour is monitored with Modified WHO partograph [25].

Manjulatha, V.R. et al., (2016) evaluated the role of Partograph in 100 primigravidae and concluded that using the Partograph improves the quality of delivery care, since it permits to identify dystocia and make logical and effective interventions. It decreases the total labour time by decreasing unnecessary strain on parturient, without any increased fetal morbidity and mortality. If accepted routinely in labour room, it can be suitable in all situations for better and more efficient management of labour [26].

Patel, H. et al., (2016) did a study on Influence of partograph tracing on management of labour. Hundred women were taken in the study. They affirmed that with proper usage of partograph and its application, right decision at the right time can be taken, achieving best feto-maternal outcome [27].

Sood, P. et al., (2016) did study to ascertain any differences in fetomaternal outcomes in induced and spontaneous labour among multiparous women delivering at term without an identified indication for induction [28]. Labour was monitored with modified WHO partograph. A prospective study of 212 women with spontaneous labour and 104 women with induced labour who were delivered showed that induction of labour does not increase the mean duration of NICU length of stay in multiparas if labour is partographically monitored.

Suchika, G. et al., (2014) on her study on the fetomaternal Outcome and Progress of Labour among Induced versus Spontaneous Labour in Nulliparous Women with aid of Modified WHO Partograph with 145 women in each group and came to consensus that that induction of labour when compared with spontaneous labour at term, does not affect the maternal or neonatal outcome in carefully selected patient population [29]. However, the greater danger of caesarean delivery posed by induction of labour should be taken explained and informed consent should be discussed with a patient who needs induction. Hence induced labour can be safe procedure if the labour is partographically monitored.

Udeme, A. et al., (2014) conducted a cross sectional descriptive study among obstetric care givers on use of partograph in general Hospital, Calabar, Nigeria. The study concluded that though staff had good knowledge of partograph but other reasons for inadequate utilization of partograph were non-availability of partograph, shortage of staff, inadequate training of the care givers. They suggested that the utilization of partograph better done can by making

partograph available in labour wards, periodic training, reasonable staff numbers and mandatory institutional policy for better labour outcomes [30].

Penumadu, K.M. et al., (2014) conducted study on role of partograph in the management of spontaneous labour in primigravida and multigravida. 250 women were analyzed with the help of modified WHO partograph. They affirmed that by using modified WHO partograph appreciably improves both feto maternal outcome. Hence routine use of partograph should be implemented in all institutions and all labour rooms in India where delivery care is being given and particularly in areas where operative and new-born facilities are deficient to facilitate early referral[31].

According to Cochrane Database Systemic Review (2014) partographs may be useful in settings with poorer access to healthcare resources, as studies in Mexico and Africa also showed some reduction in caesarean section rates with partograph use and early intervention for delayed progress in labour [32]. Six randomised controlled trials involving 7706 term women in spontaneous labour were taken. A single centre study, done in India, comparing a partograph with a latent phase (composite) and one without, established more favourable outcomes for the neonate and mother when the modified WHO partograph chart was used.

Furthermore study by Shinde et al., (2012) on progress of labour on 100 women by modified WHO partograph also showed that partographic record of labour increases the quality and regularity of observations on mother and fetus, besides providing early clue on abnormal progress hence guiding intervention on time and termination of labour [33].

Surekha and Pooja (2012) conducted study on the efficacy of modified WHO partograph on maternal and perinatal outcome on 100 women with uncomplicated full term pregnancies. The rate of emergency caesarean section was reduced from 44% in controls to 21% in cases (p value <0.05). All cases delivered within 12 hours, thus indicating significant reduction in

prolonged labour. Neonatal intensive care admissions decreased from 17% in controls to 6% in cases indicating an improved maternal & neonatal outcome [34]. Hence Modified WHO partograph significantly improves the fetomaternal outcome thus recommending use of WHO partograph in all maternity units.

Muralidhar, L. et al., (2012) with his study on partographic analysis of spontaneous labour at term in primigravida also came to a conclusion that as the partograph curve moved more toward right the duration of active phase was increased leading to increase in rate of instrumental deliveries and cesearean deliveries as well as increase NICU admissions increased [35]. APGAR score also decreased as the labour curve fell more on right side. Hence Partographic analysis of labour provides valuable information on labour progress and helps in predicting adverse maternal and neonatal outcomes during the labour.

Swamy et al., (2011) compared composite verses WHO partographs and created a randomized trial. According to their study among 3110 deliveries labour values crossed the alert as well as action lines significantly more frequently when the composite partograph was employed each with more number of augmentations($p < .005$). In 98 cases labour graph crossed the alert line in the composite partograph whereas only 55 cases it crossed with the usage of simplified partograph. The number of cases with parturient crossing the action line were 40 with the composite partograph where as in 8 cases monitored with the simplified partograph [36]. Hence WHO partograph proved to be useful tool in labour progress with more outcome leading tovaginal deliveries.

Kenchaveeriah (2011) studied 743 women and did comparsion between partograph with latent phase (composite)versus partograph without latent phase (modified) concluded that caesarean section rate was lower in the partograph without latent phase(modified) condition,and the level of caesarean section, fetal distress was also lower in that group [37]. In

addition, in the modified partograph was rated at higher user friendliness score, hence modified WHO partograph had better outcome.

Orji, E. (2010) conducted study to evaluate the progress of labour in nulliparous and multiparous using the modified WHO partograph. In his prospective study of 259 nulliparous and 204 multiparous mothers compared the labour progress rate and cervical dilatation for parturient in active phase and also analysed the data of women crossing action line. Outcome was measured considering duration of labour, frequency of augmentation, mode of delivery, and frequency of vaginal examinations. Study showed similar labour duration in the two groups. Also there was no difference found in rate of cervical dilatation in two groups. Mostly women delivered vaginally in both groups with normal labour progression. The frequency of both labour augmentation and operative intervention increased when labour progress was delayed [38]. Therefore labour progress and duration were found similar for nulliparous and multiparous when monitored with the modified WHO partograph.

Mathews et al., (2009) conducted a crossover trial to compare the two WHO partographs with the aim to compare a composite partograph including a latent phase with a simplified one without the latent phase. The study affirmed that the simplified WHO partograph was more user-friendly and more to be complete than composite partograph, and has better labour outcomes [39].

Omole, O. et al., (2009**)** did prospective partographic study on labour in 102 women with one previous lower uterine segment caesarean delivery to find the predictive value of partograph on the outcome of labour in vaginal birth after caesarean section (VBACS).It came to conclusion the results could be important in establishing policies for monitoring labour with partograph in VBACS [40].

Mohammad and Virasakdi (2008), carried out study to assess the effectiveness of utilization of the WHO partograph by midwives in Indonesia. 20 midwives who regularly conducted births randomly allocated into two equal groups. Cluster randomized control trial was used. There were 304 eligible women with vertex presentation among 358 labouring women in the intervention group and 322 among 363 in the control groups. Among intervention group 304 partographs were correctly completed. From 71 women with the graph beyond the alert line 42 were referred to hospitals introducing partograph significantly increased referral rate and reduced number of vaginal examination, Oxytocin used and obstructed labour[41]. So, the WHO partograph should be promoted for use by midwives who care for labouring women in the maternity home.

Lavender et al., (2008**)** undertook a randomized controlled trial to look into the effect of different partograph action lines on birth outcomes. It was conducted on primigravida women with uncomplicated pregnancies, in spontaneous labour at term in the northwest England [42]. Women were assigned to have their labours recorded on a partograph with an action line constructed two or four hours to the right of the alert line. If progress of labour moved toward the action line, prolonged labour was diagnosed and managed accordingly with standard protocol. Primary outcomes were rate of caesarean delivery and maternal satisfaction. So, the results depicted A total of 3,000 women were randomly assigned to groups; 2,975 (99.2%) were available for analysis It was concluded that, for primigravida women selecting low intervention care, the 2-hour partograph needed more intervention not so good maternal or neonatal outcomes in comparison with the 4-hour partograph, advocated by the WHO.

A multicenter study using partograph with an agreed protocol for managing labour on the outcome of labour was conducted. Its findings largely reinforce author's conclusions but add force to the argument for monitoring all labours with a partograph incorporating alert and action lines similar to Philpott and Castles original design. The results were reduction in

prolonged labour by 41 percent and in emergency caesarean section by 3 percent despite a reduction in the number of labours augmented by oxytocin by 54 percent. A fall in the mean numbers of vaginal examinations during labour probably contributed to the 59 percent reduction in cases of postpartum sepsis, intrapartum stillbirths and mental morbidity. The participants in the WHO trial agreed that the partograph improved the discipline of and communication about management of labour and midwives time; this may be an important element of the partographs success as more time can be devoted 'companionship'.

Fawolle et al., (2008) studied the influence of parity on the partographic management of labour in Nigerian Tertiary Hospital. Out of the 1319 deliveries, 445 women had partographic monitoring; 368 medical records were retrieved and analysed. There were 136(37.0%) primigravidae and 232 (63.0%) multiparae. The two groups were similar in booking status and risk level. It showed Primigravidae had lower rates of spontaneous labour onset (78.7) and thus higher rates of induction labour (21.3%) than multiparae ($p<0.05$; or. 51, 95% CI) (0.28-0.93). Primigravidae presented at lower cervical dilation and had more frequent vaginal examination than multiparae. Most multiparae (78.2%) had delivered between 6 hours of admission compared with primigravida (53.1%); prolonged labour occurred more frequently in primigarvdae than multiparae (6.9% vs 1.8%). These differences were statistically significant ($p=0.000$). It showed labour if monitored partographically could substantially aid in early diagnosis of dystocia and prolonged labour [43].

Ernest O. Orji , Taofeek (2008) studied labour progress and delivery outcome among induced and spontaneous labour the use of modified WHO Partograph in nulliparous females and concluded that Induced labour monitored with modified WHO partograph is comparative to spontaneous labour with no increased adverse fetomaternal outcome. A comparative study involving 136 women in each group starting with the cervical dilatation of 4cm dilated were studied. Those whose labours were induced were compared with those on spontaneous

labour; both labouring women were monitored using modified WHO partograph. Outcome measures include the mean duration of labour, the eventual mode of delivery and the feto-material outcome and WHO partograph was a useful tool in monitoring progress of labour [38].

Dangal (2007) on his study with partograph to assess the labour progression and identification of factors leading to need for intervention as required. Studies showed that partograph can play effective role in decreasing various complications with slow progress of labour in mother as well as the newborn. Prolonged labour, augmented labour, caesarean sections/operative interventions, neonatal morbidity, intrapartum fetal deaths showed significant reduction with its use [44].

Javed, I. et al., (2007) had taken up study to determine the effect of partograph on the frequency of prolonged labour, augmented labour, operative deliveries and whether appropriate interventions based on partograph will reduce maternal and perinatal complications. A case controlled, prospective and interventional study was done on 1000 women in labour was carried out before and after introduction of partograph. It also showed significant reduction in duration of labour in multigravida. Therefore maternal and perinatal morbidity and mortality was decreased [45].

Groof, D. et al., (2007) conducted their study on the impact on maternal and perinatal mortality with the introduction of partograph. A total of 1299 parturients both primigravida as well multiparous participated in the study. Two groups were formed: one consisted of women who delivered prior to introduction of partograph, second group constituted women who delivered after its introduction. Study has shown that introduction of partograph reduces the amount of time that a women is in labour. It improves follow-ups, results in more timely decision and a prompt referral to specialized centre. Hence the introduction of partograph can

have along with other appropriate measure, a considerable impact in the reduction of maternal and neonatal mortality [46].

Chongsuvivatwong, V. et al., (2010) evaluated the effectiveness of promoting the use of the WHO partograph by midwives for labour in a maternity home by comparing outcomes after birth. Two randomly equal groups were formed study and 20 midwives regularly conducting births were taken for study. A clustered randomised – control trail design was adopted under supervision from a team of obstetricians, midwives in the intervention group were introduced to the WHO partograph, trained in its use and instructed to use it in subsequent labours. This study concluded that the WHO partograph should be promoted for use by midwives who care for labouring women in a maternity home [47].

Alfirevic et al., (2006) did study the effect of varied partograph action lines on birth outcomes. In the birth setting of primigravida women selecting low intervention care, the 2-hour partograph increases the need for intervention without improving maternal or neonatal outcomes, compared with the 4 hour partograph as advocated by the world health organization [48].

NORMAL LABOUR

Definition

The strict definition of labour is: "uterine contractions that bring about demonstrable effacement and dilation of cervix". (Williams[25th] edition). It is characterised by forceful and painful uterine contractions resulting cervical dilation and subsequently causing fetus to negotiate the birth canal.

The greatest hindrance is in understanding the beginning of normal labour. The presence of contractions may herald the commencement of labour for a woman and her perception of being 'in labour', however a professional assessment to determine cervical effacement and dilatation is required.

Diagnosis of labour

Active phase of labour is considered by cervical dilation of 3 to 6 cm or more, in the presence of uterine contractions. (Williams[25th] edition) Prior to this, labour is thought to be in the latent phase. It is of great importance in the management of a labouring woman that accurate diagnosis of labour is made, as early commencement of the partograph may cause misdiagnosis of prolonged labour and lead to unnecessary intervention. Labour and progression in labour requires painful uterine activity and cervical dilatation. The presence of contractions may, therefore, herald the beginning of labour for a woman and her perceptions hence requires professional assessment to determine cervical effacement and dilatation [49].

Many a times it is difficult to do the differential diagnosis between false and true labour. Generally it is done on the mode of the contractions, as tabulated below:

PHYSIOLOGY OF PARTURITION

Three general contemporaneous theories describe the initiation of labour.

1. Functional loss of pregnancy maintenance factors.

2. Synthesis of factors that initiate parturition.

3. Mature fetus as an initial signal for parturion commencement.

However labour onset clearly represents culmination of series of biochemical changes in the uterus and the cervix, resulting from endocrine and paracrine signals emanating from both mother and fetus.

Table 1: Difference between true labour and false labour

Factors	True Labour	False Labour
Pattern of Contractions	Regular intervals	Irregular intervals
Intervals	Gradually shorten	Remain long
Intensity	Gradually increases	Remains unchanged
Discomfort	• Back and abdomen • Not stopped by sedation	Mainly in the lower abdomen.
Cervix	Dilates	Does not dilate

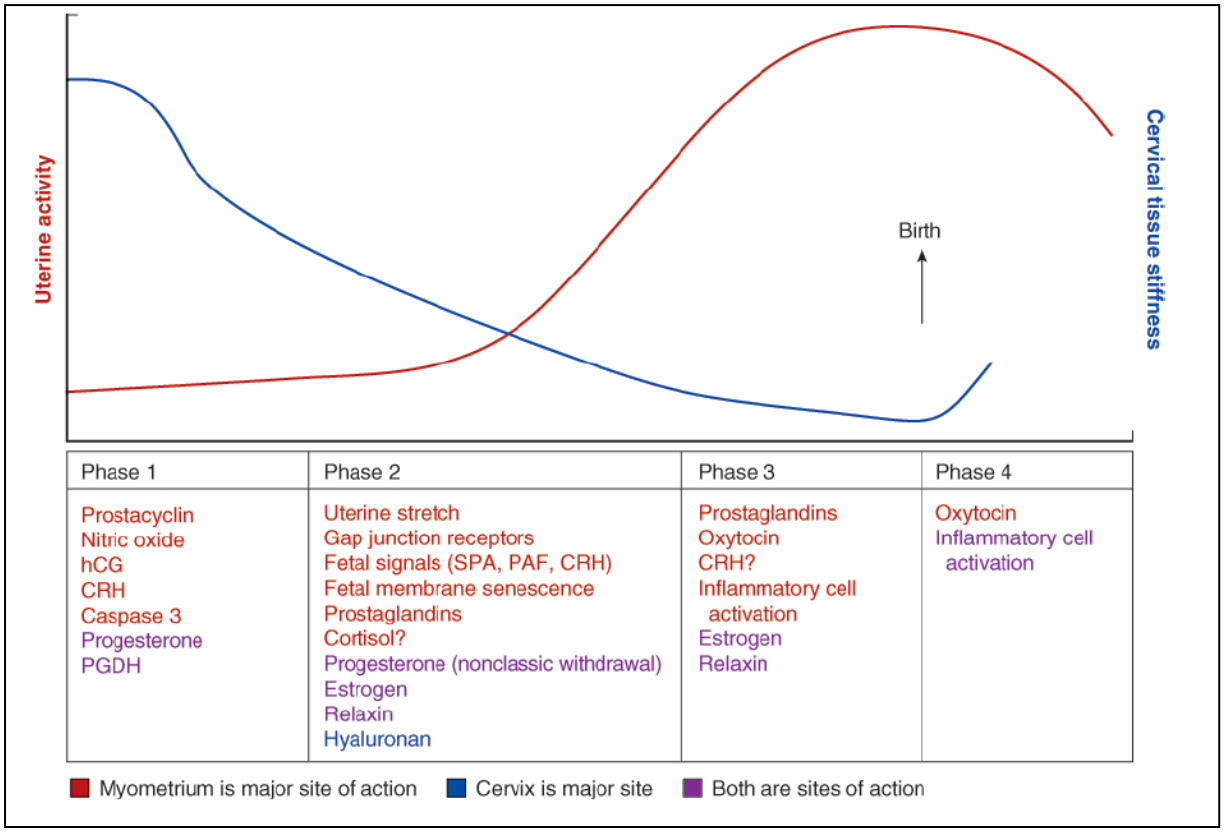

Figure 1: Key factors thought to regulate parturition.

Varied stimuli viz. mechanical stretch, inflammation and endocrine and paracrine signals can affect the transition of smooth muscle cell of uterus. Uterus has plenty of smooth muscles and the force on smooth muscles can be exerted from multiple directions. In the myometrium thick and thin filaments are found in long and random bundles throughout the cells. This plexiform arrangement aids greater shortening and force generating capacity.

MYOMETRIAL RELAXATION AND CONTRACTION

The balance between myometrial contraction and relaxation is controlled by steroid and transcriptional regulation of key genes (peptide – hormone) and their protein products.

Quiescence is maintained by:

1. Reduced intracellular calcium and diminished intracellular crosstalk.
2. Ion- channel regulation of cell membrane potential

3. Activation of uterine endoplasmic reticulum stress- unfolded protein response
4. Uterotonic degradation

Contractility maintained by:

1. Enhanced interaction between the actin and myosin protein
2. Heightened excitability of individual myometrial cells
3. Promotion of intracellular crosstalk that allows synchronous development of contractions.

Actin myosin interaction

Actin must be converted from globular to a filamentous form for muscle contraction. Also it must be attached to the cytoskeleton at focal points in the cell membrane to allow for tension to develop.

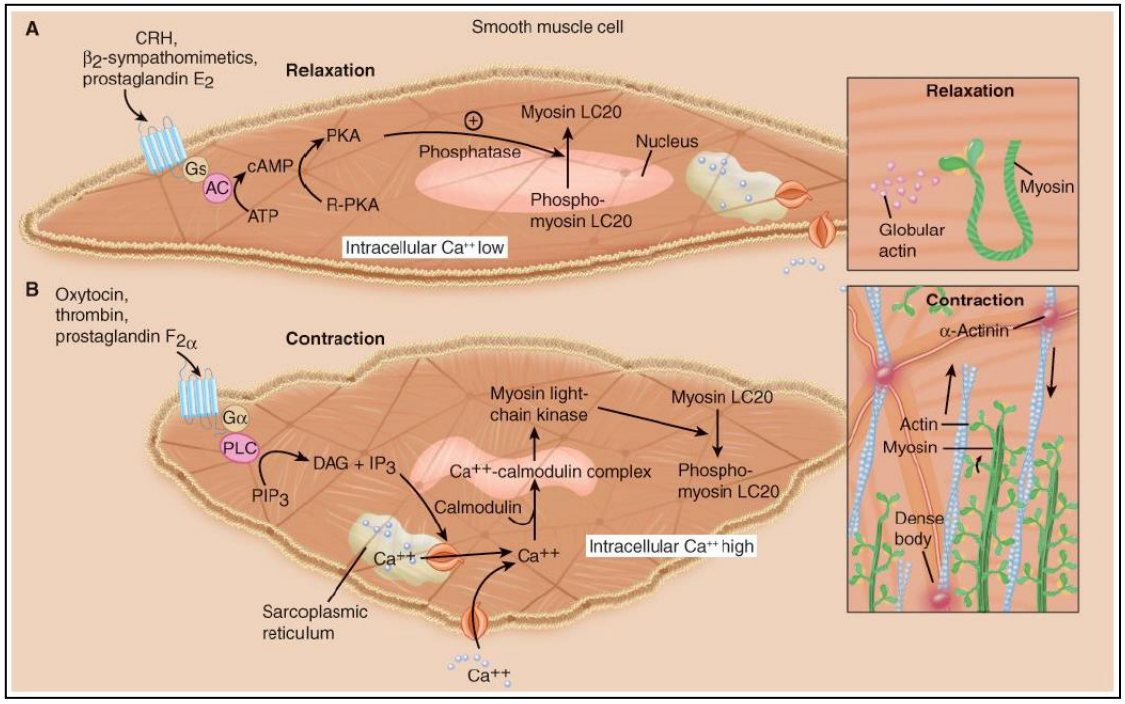

Figure 2: Uterine myocyte relaxation and contraction

PHASES OF PARTURITION

Accordingly the uterine parturitional process is categorised in four functional states. Phase 1, 2, 3 and phase 4. The divisions are made in recognition of the major uterine accommodations that characterise each parturitional phase and to define the morphological and functional transition that must be made to progress in an orderly and timely manner from one phase to next.

Phase 1:

The first phase which is prelude to the parturition, is the time when smooth muscles of uterus maintain tranquillity and cervical stiffness. It is typically maintained from before the implantation till late gestation. Phase 1 is established by harnessing the potential power of the uterus by rendering this organ non responsive to natural stimulus and by imposing contractile paralysis against enormous mechanical and chemical changes to empty its contents.

Phase 2:

It is the period when functional changes within the myometrium as well in cervix takes place and prepares uterus for labour. This phase is commonly identifiable clinically during the last days of pregnancy by distinctive signs: ripening of the cervix, increased frequency of reasonably painless contractions, formation of lower uterine segment and myometrial irritability.

Phase 3:

The phase uterine contraction culminates in progressive cervical dilatation with descent of fetus and results in delivery. This the period of active labour. It can be further divided into three stages of labour. The implementation of partograph can be done in this phase.

Phase 4:

During this phase uterine involution and and recovery takes place. Fertility restores within four to six weeks. Generally so long as the mother continues to breast feeding, infertility remains due to lactational amenorrhea and ovulation.

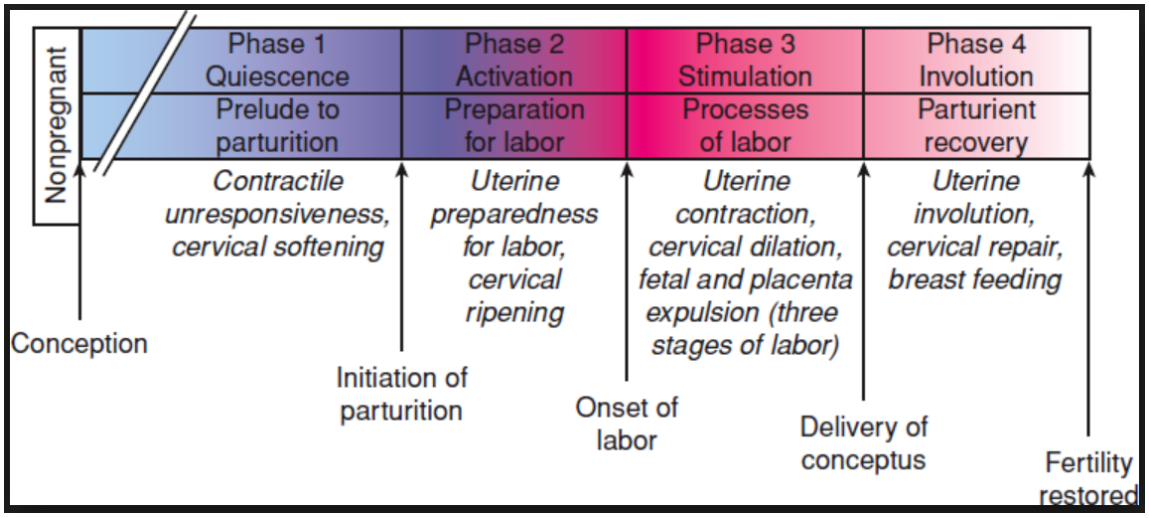

Figure 3: Phases of parturition

UTERINE CONTRACTIONS

Uterine contractions are thought to originate from a pacemaker located near the cornua of the uterus. The contraction wave spreads downward in a peristaltic wave. As myometrial fibres contract and shorten they undergo retraction. In normal circumstances, the strength of the contraction is greatest in the upper uterine segment as there is greater muscle mass in this region.

The intensity and frequency of contractions increase as labour progresses. This is perhaps aided by the Ferguson reflex, which is mechanically stretching the cervix which amplifies the activity of the uterus.

Success of labour depends on: 3 “P” s that is Power, passenger and passage.

POWER

- Frequency of contractions – number of contractions occurring over a 10 minute period. These are recorded and marked on partograph.
- Duration of contractions – it refers to the effective uterine activity and generally continues for a time period more than 40 seconds as to be labeled as effective.
- Amplitude– it is subjective assessment of the professed strength of contractions. The intrauterine pressure monitoring is not done routinely.

THE PASSENGER

The size of the fetal head and presentation and position should be appropriate.

- Fetal heart rate recording – it refers to hearing the fetal heart following a contraction each 15 minutes for one minute duration during the first stage. The fetal heart rate should be recorded after each expulsive contraction during the second stage.
- Station – refers to the position of the leading part of the presenting part in context to ischial spines.
- Position – to be assessed by counting the number of sutures: there are four sutures comprising anterior and three making the posterior fontanelles.
- Moulding – it refers to the alteration in relationship between skull bones.
- Application to the cervix
- Caput formation.

THE PASSAGE: CERVIX

The cervix should fully effaced and dilated and the pelvic anatomy should be compliant for smooth delivery.

STAGES OF LABOUR

A scientific approach based on statistical observations was adopted in 1954 by Friedman and sigmoid pattern for labour was observed by plotting a graph considering cervical dilatation against time. The phase 3 is synonymous with active labour, which is customarily divided into three stages.

STAGE 1: It begins with spaced uterine contractions of sufficient uterine frequency, intensity, and duration to bring about cervical thinning (effacement). Varied uterotonics can be used on this stage of labour to bring about cervical changes. These stimulate smooth muscle contractions through G–protein coupling. This stage of labour is the stage of cervical effacement and dilation.

STAGE 2: This stage begins when cervical dilatation is complete and ends with the delivery of fetus. Thus, it is stage of fetal expulsion.

STAGE 3: it begins immediately after delivery of the fetus and ends with the delivery of placenta. Hence it is stage of placental separation and explusion.

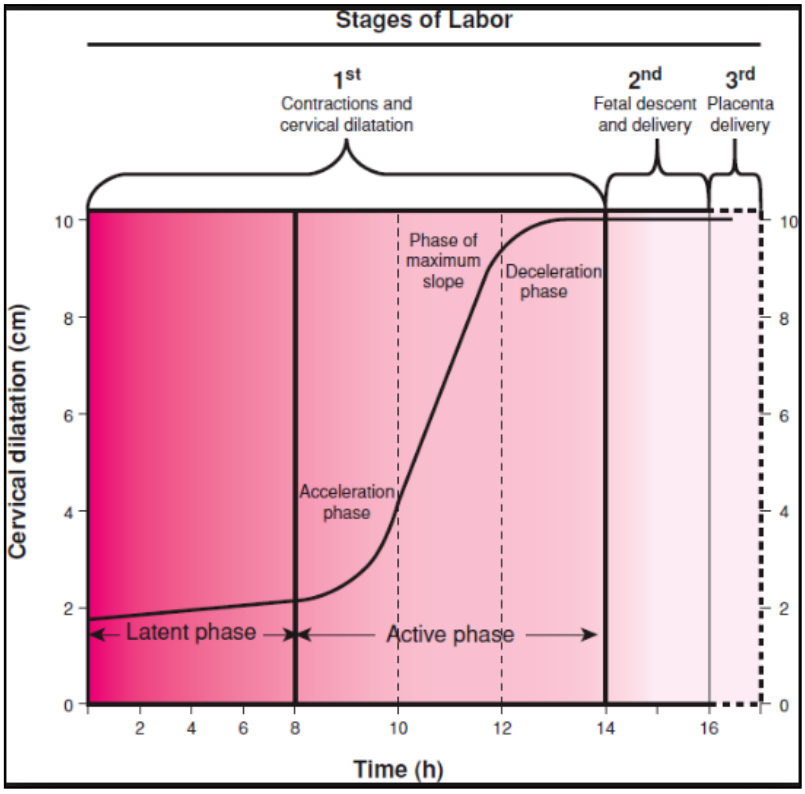

Figure 4: Stages of labour

FIRST STAGE: Clinical onset of labour

Uterine labour contractions: labour initiation is heralded by spontaneous release of small amount of blood tinged mucus from the vagina. This extrusion of mucous plug is referred as "show". Pain during uterine contractions can be due to hypoxia of the myometrium which is contraction, nerve ganglias compression in the cervix and lower uterus by contracted interlocking muscle bundles, cervical stretching or stretching of peritoneum overlying the fundus.

Mechanical stretching of the cervix (Ferguson reflex) enhances uterine activity. Manipulation of the cervix and stripping of the fetal membranes is associated with rise in level of prostaglandins PGF2alpha.

The interval between contractions narrows gradually from approximately 10 min at the onset of first stage labour to as less as 1 min or less in the second stage.

In the active phase the duration of each contraction ranges from 30 to 90 seconds and averages 1 minute. Amniotic fluid pressure varies from 20 to 60 mm of Hg.

Distinct upper and lower segments

The anatomical uterine divisions which initiated in active labour becomes increasingly evident and can be felt by abdominal palpation. The upper segment is firm during contraction, whereas the lower segment is softer, distended and more passive. Thus upper segment contracts, retracts and expels the fetus. The softened lower uterine segment and cervix dilates and thinned out helping in expulsion of fetus. As result a boundary between two is marked on the inner uterine surface by a rim – physiological retraction ring. Extreme thinning of LUS as in obstructed labour leads to formation of pathological retraction ring also known as Bandl ring. The upper segment retracts only to the extent that the lower segment distends and cervix dilates. The upper part of uterine cavity s becomes slightly smaller with each contraction .Because of this successive shortening of muscle fibers, the upper active segment becomes progressively thickened throughout first and second stage of labour. This process continues and results in considerably thickened upper uterine segment immediately after delivery.

Changes in uterine shape

Each contraction gradually elongates the ovoid uterus and thereby narrows the horizontal diameter. This leads to greater fetal axis pressure serving to straighten the fetal vertebral column. As a result lower uterine segment with cervix gets puller upward and encircling lower pole of the fetus.

Ancillary forces

After cervical dilation, maternal intra-abdominal pressure is the most important contributing force in fetal expulsion. It is aided by Pushing which is defined as contraction of abdominal muscle simultaneously with forced respiratory efforts with the glottis closed.

Cervical changes

The contraction forces causes two fundamental changes in cervix takes place- effacement and dilatation. Cervical effacement is obliteration or taking up of the cervix. Effacement results in expulsion of the mucous plug as cervical canal is shortened. Cervical dilation is classified as into latent and active phase. The active phase is subdivided further into the acceleration phase, the phase of maximum slope, and the deceleration phase [52].

The first phase ends with cervical dilatation.

SECOND STAGE: FETAL DESCENT

A typical hyperbolic curve is formed in normal labour descent pattern when the station of the fetal head is plotted as function of labour. Station is described as the descent of fetal biparital diameter in relation to a line drawn between maternal ischial spines. During second stage labour, the speed of descent is maximal and is sustained utill presenting part is at the pelvic floor. In nullipara the descent rate may be lesser than mutiparas.

PELVIC FLOOR CHANGES

The central component of the floor is the levator ani muscle and the fibro muscular connective tissue that covers upper and lower surfaces. The altered extracellular matrix leads to the biochemical changes in these structures during parturition.

THIRD STAGE: DELIVERY OF PLACENTA

It begins immediately after delivery and involves separation and explusion of placenta and membranes.

UTEROTONINS IN PARTURITION PHASE 3

Oxytocin- the first uterotonin implicated in starting of parturition. It is vital in second stage of labour and in the puerperium. It likely cause persistent contraction.

Prostaglandins – it has important role in phase 3 of parturition. Prostaglandins or their metabolites in amniotic fluid, maternal plasma and maternal urine are increased in labour. PGE2 and PGF2alpha levels are increased in second stage.

Endothelin – 1- it is produced in myometrium of term gestation and it induces synthesis of other contractile mediators such as prostaglandins and inflammatory mediators.

Angiotensin II – AT1 receptor is preferentially expressed in gravidas.

FUNTIONAL DIVISION OF LABOUR

Labour is divided into three division .Each division are clearly demarcated and functionally different. It is influenced by various factors. Each factor responds in singular manner to various influences. It clearly distinguishes them by functional technique of assessment, manifestation of disorders, management regimens and prognosis.

It is classified as follows:

A. Preparatory division consisting of the latent phase and acceleration phase

B. Dilatational division comprising the phase of maximum slope

C. Pelvic division including the stage of deceleration and the 2nd stage of labour.

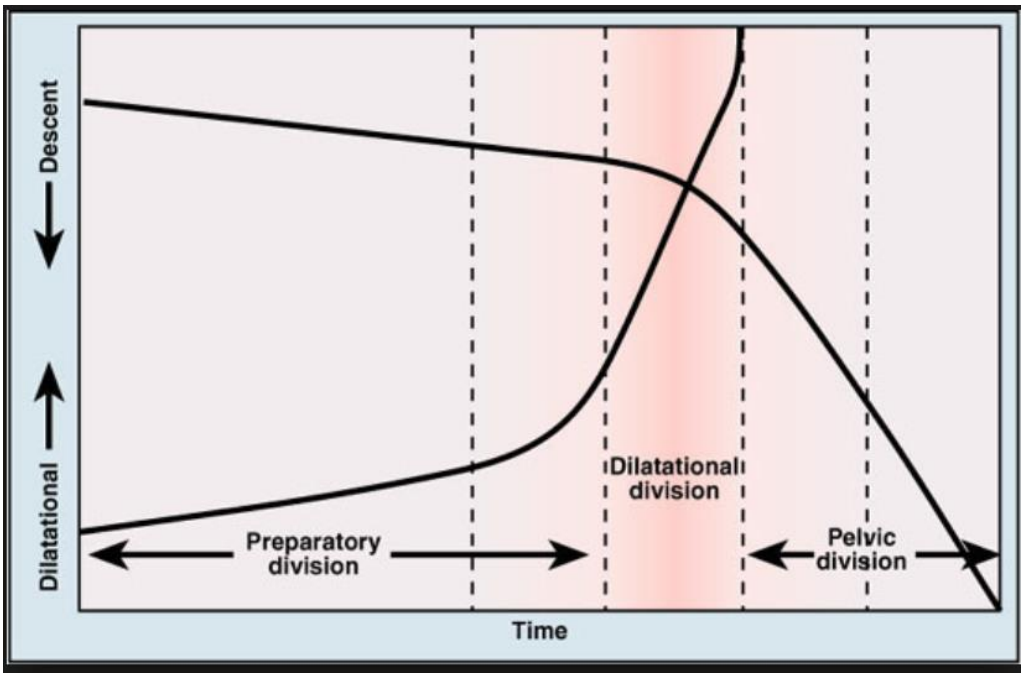

Figure 5: Functional divisions of labour

Main clinical features:

1. Preparatory division: Contractions are coordinated and the preparation of cervix takes place. It begins from starting of contractions till acceleration phase ends. There happens very less cervical dilation in the preparatory division of pregnancy but there are considerable changes noted in cervical connective tissue. It is adversely influenced by excessive sedation. Its abnormality is seen as latent phase prolongation and prolongation of acceleration phase. Adequate rest is helpful.

2. Dilatational division: cervix becomes actively dilated. It corresponds to phase of maximum slope. It is measured by cervical dilatation rate. Its abnormality is manifested by protracted active phase. It is adversely associated with myometrial dysfunction and disproportion, excessive sedation and anesthesia. The dilatational division corresponds to

the time when dilatation proceeds rapidly. It is not affected by sedation or any conduction analgesia. The disorder is manifested by protracted dilatation and protracted descent.

3. Pelvic division: In this phase fetus descends delivers through pelvic negotiated mechanism of labour. It begins with deceleration phase and with delivery of newborn. The pelvic division starts with the deceleration phase. In this phase the classical mechanisms of labour which involves the cardinal fetal movements that is: engagement, flexion, descent, internal rotation, extension, and external rotation takes place. It is calculated by rate of descent. It is adversely by disproportion, malposition and anesthesia. Its disorder is seen as protracted deceleration phase, secondary arrest of dilation and failure of descent.

CERVICAL DILATATION PATTERN

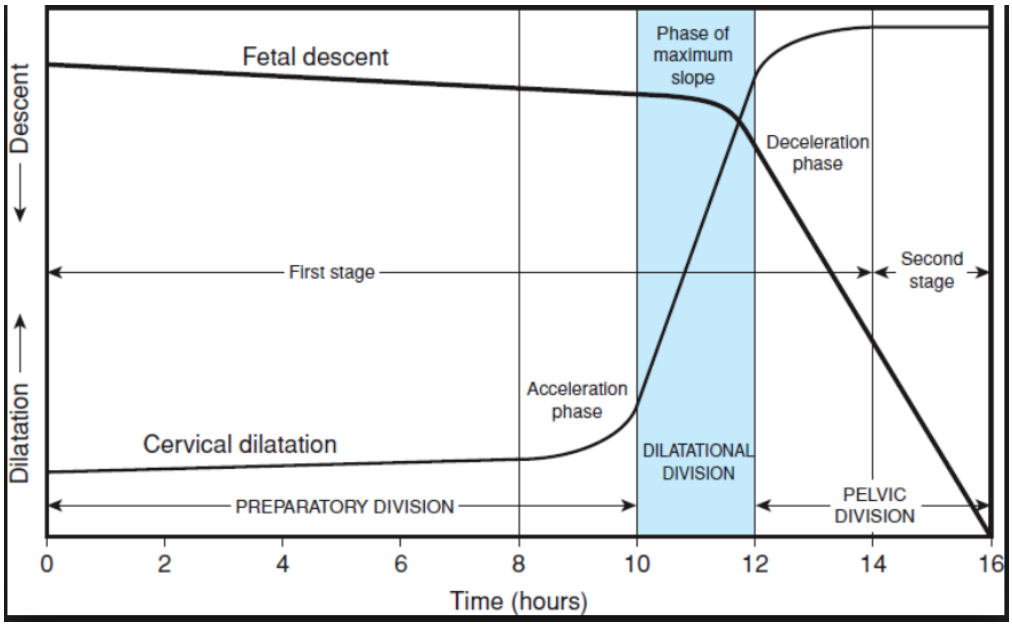

Figure 6: Fetal descent and dilatation

There occurs very less descent of the presenting part during the latent phase and also in early phase when cervical dilation is occurring. The descent occurs primarily when dilatational curve enters the phase of maximum slope. Highest descent occurs just before the end of first stage of labour and continues in a steady linear manner until the fetal presenting part reaches the perineum. It is during this phase that the cardinal movements of labour takes place.

PHASES OF LABOUR

Latent phase

As, defined by Friedman (1971) the onset of latent labour is the point at which the mother perceives regular contractions. The latent phase of most women ends once dilatation of 3 to 5cm is achieved. It defines dilatation limit beyond which active labour can be expected [50].

It is mainly occupied with orientation, coordination and polarization of uterine contractions with preparedness of cervix for later active dilatation.

This phase of labour can be troublesome in managing as many women can have painful contractions for prolonged periods of time with little in the way of cervical change. This is both exhausting and demoralising for women.

Latent phase extends from onset of regular uterine contractions till the beginning of active phase. It has a flat graph with mean slope of 0.35cm/hr and standard deviation of 0.2.

Latent phase if prolonged beyond twenty hours in primigravida and fourteen hours in multigravida was preferred to be the higher limit normal for the purpose of defining

prolonged latent phase. (Friedman and Sachtleben, 1963). These times correspond to 95th percentile.

Factors affecting latent phase include excessive sedation or epidural analgesia, unfavorable cervix i.e thick, uneffaced or undilated and false labour.

Active phase

It starts when latent phase concludes and is apparent on the graph as that point in time at which the rate of dilatation begins to change acutely, the graph becoming more steeply inclined. Thus a cervical dilatation of 3 to 6 cm or more in the presence of uterine contractions can be taken to reliably represent threshold for active labour.

Friedman (1972) found the rate of cervical dilatation ranged from minimum of 1.2cm/hr for nulliparas and 1.5cm/hr for mulliparas. His analysis for active phase labour further described rate of fetal descent and cervical dilatation. Descent begins in later stage of active dilatation starting at 7 to 8 cm in nullipara and becoming most rapid after 8cm .

The active phase is subdivided into 3 distinct phases:

1) Acceleration phase with cervical dilatation.

2) Phase of maximum slope of 4-9 cms dilatation.

3) 3) Deceleration phase of 9-10 cms dilatation.

1. Acceleration phase: This is short and variable, but is important in determining the ultimate outcome of labour. It leads from the minimum slope of the latent phase to the maximum slope which follows it. A slow acceleration phase generally presages a lower maximum slope and therefore a prolonged total labour. A rapid change in the

acceleration phase precedes a short residual labour. Once active phase starts, and there is no further progress then impeding problems of dystocia should be anticipated.

2. Phase of maximum slope: This is a good measure of the overall efficiency of the labour. Its slope is a good indicator of how effective the uterine contractions are in producing cervical dilatation. The slope of this phase is inversely related to the total dilatation of the first stage of labour. Maximum cervical changes occurs in this phase. Bony dystocia, malposition and heavy sedation were some factors unfavorably influencing this phase. Oxytocin infusion was found to shorten this phase.

The maximum rate of dilatation should normally exceed 1.2 cm per hour in primigravidas and 1.5 cms per hour in multigravid patients. Failure of this criteria gives rise to protracted active phase dilatation or prolonged active phase. If the cervical dilatation stops in the active phase then it manifests as flattening of the dilatational curve for at least two hours and it is called secondary arrest of dilatation.

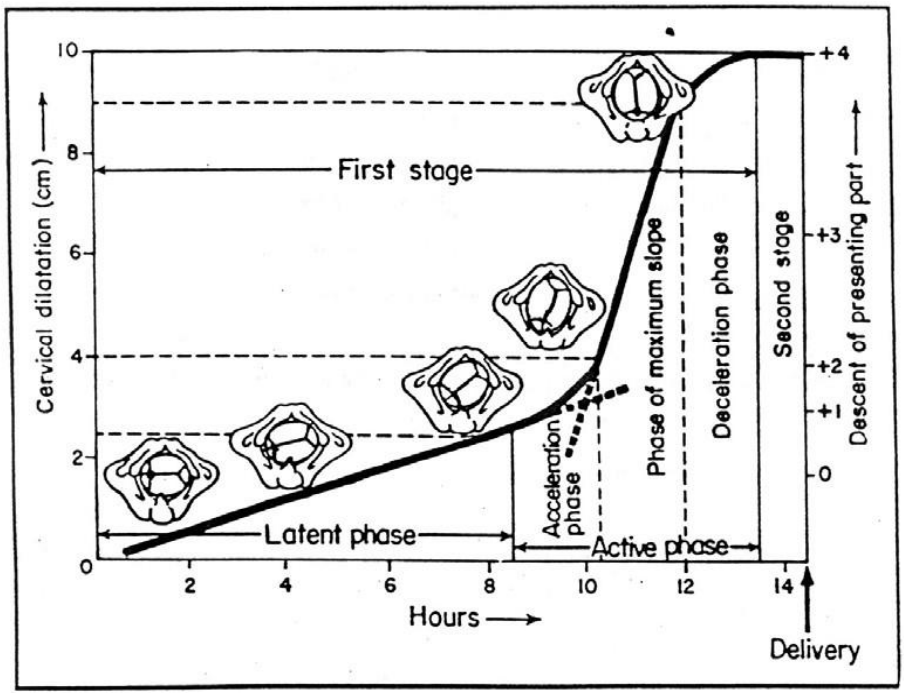

Figure 7: Composite partographic representation of different phases of labour

3. Deceleration phase: This illustrates the diminution in the rate of progressive dilatation of the cervix from a period of greatest activity in the phase of maximum slope to the static condition of cervical dilatation which occurs during the 2nd stage. The deceleration phase reflects fetopelvic relationships. Cervical retraction about the fetal presenting part is essential in obtaining full dilatation. The presenting part of fetus descends during this phase and continues during the second stage under normal circumstances.

The deceleration phase however is not associated with any true deceleration in the myometrial contractility/activity and thus has been suggested to be an artifactual phenomenon. The deceleration phase can perhaps best be looked upon as that portion of labour during which cervix is "turning the corner".

Excessive sedation, malposition improperly administered anesthesia and cephalopelivc disproportion were found to increase the deceleration phase. While in primigravidas oxytocin shortens this phase, the same effect was not seen in multigravidas.

Duration of deceleration phase in primigravidas averages 50 minutes and in multigravidas averages 22 minutes. The 95th percentile limits were defined as 2.7 hours and 52 minutes respectively. A prolonged deceleration phase is characterized by a deceleration phase duration of longer than 3 hours in a primigravida and 1 hour in a multigravida. Other abnormalities are protracted descent with progressive descent rate less than 1cm/ hour in primigravid and 2 cm/ hours in multigravida or arrest of descent in which there is no descent for more than two hours.

After this phase the cervix is fully dilated and effaced and the patient now enters the second stage of labour. After entering the second stage only observations of progressive descent are available for continuing the assessment of labour.

Line A Progress in cervical dilation with time and Line B, descent of presenting part with the progression of labour. Use of this type of graph has provided a means for achieving nearly perfect diagnostic capability without requiring any forms of mathematical computation of the rates of dilation or descent. With these modified graphs, the diagnosis of the specific abnormality could be made in every instance of dysfunctional labour pattern.

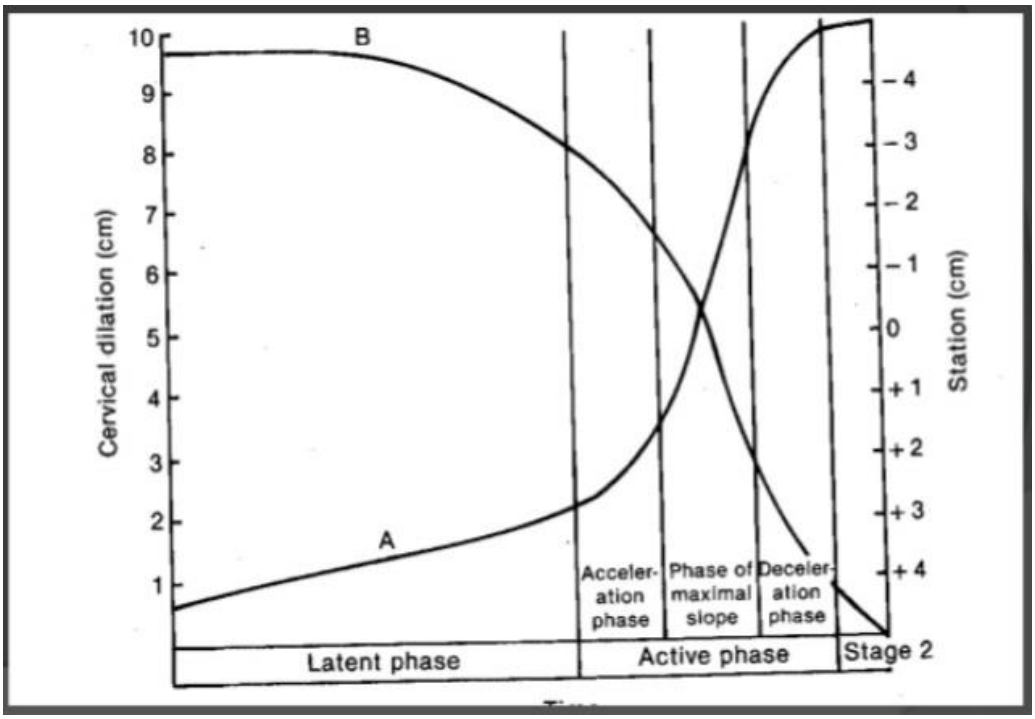

Figure 8: Graphic representation of labour (Friedman curve)

DYSFUNTIONAL LABOUR

Estaman coined the term “Dysfunctional labour”. It is vital to assess progress in labour and one should acquire important skills while managing parturient. An identification of inadequate progress in the first or second stage affects management decisions and helps in avoiding cases of prolonged labour and dysfunctional labour.

Of the estimated annual toll of a half a million maternal deaths, almost 99 % occur in developing countries. An unknown proportion of these follow prolonged labour chiefly due to cephalopelvic disproportion which may result in obstructed labour, maternal dehydration, and obstetric fistulae and indirectly PPH. Maternal mortality is mainly due to puerperal infection, ruptured uterus, and perinatal mortality has been largely due to asphyxia. Maternal morbidity has resulted from maternal distress due to exhaustion and ketosis and perinatal morbidity from fetal distress and traumatic delivery (Lewellyn-Jones 1986) [52].

Early identification of abnormal progress and safeguarding of prolonged labour to minimise adverse effects is therefore imperative.

Abnormal labour has three main causes: inefficient uterine action, occipito-posterior position and cephalopelvic disproportion (O'Driscoll et al., 1993) [53].

Trends have shown that rate of caesarean section are escalating and the paramount increase can be attributed to failure to progress in labour.

There are many constraints – geographical, economic, political and sociocultural which lead to either the non-availability or non-utilization of the basic obstetric care which is required to manage obstructed labour satisfactorily

The literature highlights the confusion and inconsistencies which surround the management of women

PROLONGED LABOUR

Prolonged labour is most often defined as onset of regular, rhythmical painful contractions accompanied by cervical dilation where labour is longer than 24 hours. This definition however has limitations, and therefore it is more useful in terms of management to refer to prolonged stage of labour, i.e. “prolonged latent phase of labour” or “prolonged active phase of labour”. Latent phase being the onset of regular painful contractions with cervical dilation up to 4 cm, and should not be longer than 8 hours. Prolonged active phase is, regular painful contractions with cervical dilation of more than 4 cm should not be more than 12 hours without full assessment in a facility able to offer management and treatment of complications.

Causes of prolonged labour

It is usual to describe by the three "Ps": Powers: poor or uncoordinated uterine action. Passenger: fetal head too large or position abnormal. Passage: pelvis abnormal, or tumors or obstruction in pelvis or birth canal.

Risks of prolonged labour

It is crucial to identify the cause early to be able to take the appropriate action. Unsatisfactory progress can be the earliest sign of obstructed labour.

Obstructed labour

Obstructed labour means that, in spite of strong contractions of the uterus, the fetus is unable to negotiate through the pelvis due to insurmountable barrier preventing its descent. Obstruction mainly occurs at the pelvic brim, but sometimes it may occur in the cavity or at the outlet of the pelvis.

Causes of obstructed labour:

Cephalopelvic disproportion (small pelvis or large fetus) abnormal presentations, e.g. - brow - shoulder - face with chin posterior - after coming head in breech presentation.

Fetal abnormalities, e.g. – hydrocephalous

Abnormalities of the reproductive tract, e.g. pelvic tumour - stenosis of cervix or vagina ,tight perineum .

Complications as a consequence of obstructed labour can be prevented if a woman in obstructed labour is identified early and appropriate measures are taken. Even when obstructed labour does not occur, excessively prolonged labour can be detrimental to both the mother and fetus, and may result in maternal and/or fetal distress. Also prolonged labour leads to greater risk of infection due to increased intervention rates and frequent vaginal examinations.

CEPHALOPELVIC DISPROPORTION

Cephalopelvic disproportion happens due to misfit between the fetal head and the pelvis. Hence making it difficult or impossible for the fetus to pass safely through the pelvis. Factors contributing to CPD may be due to a small pelvis with a normal size head, or a normal pelvis with a large fetus, or a combination of a large baby and small pelvis. It cannot usually be diagnosed before the 37th week of pregnancy because before then the head has not reached birth size.

Cephalopelvic disproportion may be mild: In these cases the problem may be overcome during labour. Strong uterine contractions, relaxation of the pelvic joints and moulding of the fetal skull may enable the fetus to pass through the pelvis for vaginal delivery

Severe: This occurs because the pelvis is too small, is abnormal in shape, or because the fetus is abnormal or too large for the pelvis through which it has to pass. For these cases Operative delivery is imperative.

DYSTOCIA: It means difficult labour. It is characterised by abnormally slow labour progress. The frequency depends on the inherent makeup of the gravidae and the prevailing obstetric practices [56]. The incidence (6 to 8 times) is more in nulliparae. Arrest and protraction disorders are more in nulliparae. On the other hand prolonged latent phase is more commonly in multiparae. Only one third of dysfunctional labour pattern in nulligravidae is characterised by prolonged latent phase whereas nearly half multipare have this dysfunction.

It becomes apparent from three distinct abnormality categories.

1. Uterine dysfunction that is insufficiently strong or inappropriately coordinated uterine contractions to efface and dilate the cervix in addition to voluntary inadequate maternal muscle effort during second stage.

2. Fetal abnormalities of position presentation or anatomy may hinder progress.

3. Structural changes may reduce the size maternal pelvis. Fetal descent may also be guarded by soft tissue abnormalities of the reproductive tract.

Alternatively these alterations can be mechanically simplified into three categories that include abnormalities of power, passenger and the passage.

Another terminology failure to progress reflects lack of progressive cervical dilatation or lack of fetal descent. It has become increasingly popular definition of ineffectual labour.

Ineffective labour is explained by cephalopelvic disproportion and failure to progress. (Willams 25th edition)[49].

Common clinical findings are:

1. Protracted of cervical dilatation or fetal descent: It includes protracted labour, arrested labour and inadequate explusive effors.

2. Fetopelvic disproportion: It comprises large fetal size, insufficient pelvic capacity malpresentation or abnormal fetal anatomy.

3. Rupture of membranes without labour.

MECHANISM OF DYSTOCIA

The cervix dilates slowly or not at all, because the fetal head cannot of the cervixes descend and put pressure on it. At the same time the cervix may become oedematous leading to prolongation of the first stage of labour. However, the first stage may be normal if obstruction occurs only at the outlet. Here 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 implies that the obstruction has been overcome by labour and that vaginal delivery will be possible (provided there is no outlet obstruction)

Abnormalities of the expulsive forces

As uterine contractions lead to cervical dilation as well as propulsion and expulsion of fetus, during second stage it is aided by voluntary and involuntary muscle action of abdominal wall "pushing". The diagnosis of uterine dysfunction in latent phase is difficult. Women who are not in active labour are erroneously treated for this dysfunction. Three notable advances have helped in the treatment of uterine dysfunction. Firstly the realization that undue prolongation can contribute to maternal as well as perinatal morbidity and mortality. Secondly oxytocin can be administered intravenously to treat certain uterine dysfunction. Lastly, Caesarean

delivery is chosen over difficult midforcep delivery when oxytocin fails or when its use is inappropriate.

Types of uterine dysfunction

Two physiological type of dysfunction are defined.

Hypotonic uterine dysfunction: no basal hypotonus, synchronous uterine contractions. However pressure during a contraction is insufficient to dilate cervix.

Hypertonic uterine contraction or in coordinate uterine dysfunction: Either basal tone is elevated appreciably or there is distortion of pressure gradient which results from more forceful contraction of the uterine midsegment than the fundus ,for complete asynchrony of the cornual impulses or from combination of both.

LABOUR DISORDERS (Willams 25th edition)

Disorders of preparatory division of labour prolonged latent phase.

Latent –phase prolongation

Latent phase may be prolonged which is more than 20 hours in nullipara and 14 hours in multipara. In some women uterine contraction may cease, suggesting false labour. Friedman (1967) plotted the cervical dilatation in opposition to the time elapsed and considered the latent phase duration from starting of regular uterine contraction to active dilation of cervix when the curve swings up in the active phase. Philpott R.H considers the admission time as zero hour and the latent phase of 8 hours is considered abnormal. Hence the transition from false or prodromal labour to latent phase is not properly defined. Latent phase prolongation significantly does not cause increased risk of operative deliveries unless subsequent major labour aberration occurs [10, 11].

Nearly two third of cases progress well but the incidence of subsequent protraction and arrest disorders among these patients is as common as the cases with normal latent phase.

Etiology

Unripe cervix 18%, false labour 10%, uterine dysfunction (17%), iatrogenic influences, sedation10% anaesthesia 7% or cephalopelvic disportion.

Treatment

For iatrogenic causes expectancy is in order. For the later rest by narcotics and sedation can be given to patients with this phase prolongation. The patient with false labour can be discharged. After a period of rest for 6 to 7 hours induced by medication the patient will be out of labour indicating that their former condition was due to false labour or the patient might progress up on dilatational curve indicating active phase progression which should continue in majority cases or her pattern may remain unchanged. If the pattern remains unchanged if there are no contraindication to oxytocin infusion for acceleration of labour this might result in progress of labour. The prognosis is excellent for the cases as managed with more than 50% proceeding to normal vaginal delivery.

According to Philpot (1972) the patients with latent phase more than 8 hours in hospital with no signs of fetal distress or any major disproportion, membranes are ruptured and labour is augmented with oxytocin [61].

Most of the patients are taken up unnecessarily for caesarean delivery for no other reason than failure of progress of labour. Also in cases of CDP patient is taken up for caesarean section.

Disorders of dilatation division of labour

Active phase disorders

The WHO (1994) has defined protraction as <1cm/hr dilation for minimum of 4hours in its Partograph.

Protraction disorders: slower than normal progress. It includes protracted active phase dilatation and protracted descent.

Protracted active phase dilation: This is due to primary dysfunctional labour. In nulliparas it is considered as dilatation <1.2 cm/hr and <1.5 cm/hr in multiparas.

Active phase arrest diagnosed by Handa and Laros (1993) defined as no dilatation for 2 hours or more than 2 hours. This occurs in cases where labour with inadequate uterine contractions [55].

Etilogy: Although malposition occipitoposterior, occipitotransverse, excessive sedation and epidural anaesthesia are common causative factors evaluation for CPD must be performed clinically to rule out this condition. PROM and some unknown factor are also included in etiology.

Treatment: For cephalopelvic disproportion due to bony dystocia caesarean section should be done. For the rest support is essential. It is essential to keep away from excessive sedation, anaesthesia and amniotomy the latter to avoid potential risk of infection. The oxytocin infusion increase frequency, intensity and duration with no consequence on dilatation pattern. The most significant character of these disorder is there unreluctently slow progress. In such cases particular attention should be given to fluid and electrolyte needs.

According to Philpot (1972) if in the active phase of labour the rate of dilatation crosses the action line active intervention should be done. If it is due to bony dystocia, CPD, malpresentation or marked fetal distress caesarean section has to be done. All other patient should go for active management of labour. It involves. , adequate rehydration, adequate analgesia oxytocin drip in dilution gradually increasing till adequate contractions are achieved. If still failure to progress after 6 hr then caesarean delivery to be undertaken [61].

All other patient deliver by spontaneous or by ventouse or forceps.

Prognosis: there is increased risk to mother and fetus from this disorder as it carrying the hazard of traumatic delivery. Spontaneous progress occurs in 1/3 of cases delivering by vaginal delivery. Nearly 2/3rd patient go for secondary arrest pattern. Hence the prognosis is serious in both nulliparae and multiparae.

Protracted descent pattern

Progressive uninterrupted descent of presenting part is necessary for normal second stage of labour. Protracted descent is defined as descent <1 cm/hr in nulliparas and <2 cm/hr in multigravida.

The etiological factors include cephalopelvic disproportion, malpresentation, excessive sedation and epidural anaesthesia PROM and amniotomy in active phase.

The occurrence in both nulliparas and multiparas is approximately 47%. There is high frequency of foregoing patterns of protracted active phase dilatation and secondary arrest of dilatation.

Treatment: It consist of oxytocin infusion. According to WHO (1994) protraction is defined as < 1 cm/hr cervical dilatation for minimum of 4 hours. Appropriate treatment should be administered that is if insufficient Montevideo units are noted, oxytocin augmentation is

recommended. It was used nulliparae but it was found that majority appeared to have had no influence on the course of descent. Women with this descent pattern were found to have increased rate of instrumental delivery as well as caesarean section.

Prognosis: Protracted descent disorder who develop arrest of descent during path of labour the incidence of forcep as well as caesarean delivery is increased. Hence prognosis not good.

Disorders of pelvic division of labour

Arrest disorders: complete cessation of progress. For diagnosis of each women must be in active labour with cervical changes.

Arrest disorders

Prolonged deceleration phase: It is >3hr in nulliparas and greater than 1 hour in multiparas. This phase is associated with all phases except the latent phase.

Etiology: CPD, malpositions, excessive sedation and improperly administered anesthesia. Association with other forms of dysfunction labour are very frequent with this disorder commonly protraction disorder and arrest disorders.

Treatment: The incidence of operative delivery is increased in these cases. On rare occasion oxytocin stimulation may help in multigravida. Caesarean section almost always required in these cases.

Secondary arrest of dilation: It is arrest of dilatation more two hours in nullipara as well as multiparas. 1 in 20 develop this disorder.

Etiology: It can be CPD, administration of excessive anaesthesia, sedation and endogenous factors like bony dystocia or malposition or malpresentation or inadequate or in coordinate uterine action. The combination of many factors was evident than a single cause. In these

cases there is overall prolongation of duration of the active phase, deceleration phase and second stage together with prolongation of maximum slope of dilation and descent. These disorders are frequently linked with protraction disorder in 50%.

Treatment: Oxytocin infusion in cases with inadequate uterine contractions and caesarean se delivery in case with severe CPD and bony dystocia.

An example of secondary arrest is illustrated on the partograph below. The poor progress between labels B and C on the partograph were as a result of coordinate uterine action which was corrected by Syntocinon commenced at time point C.

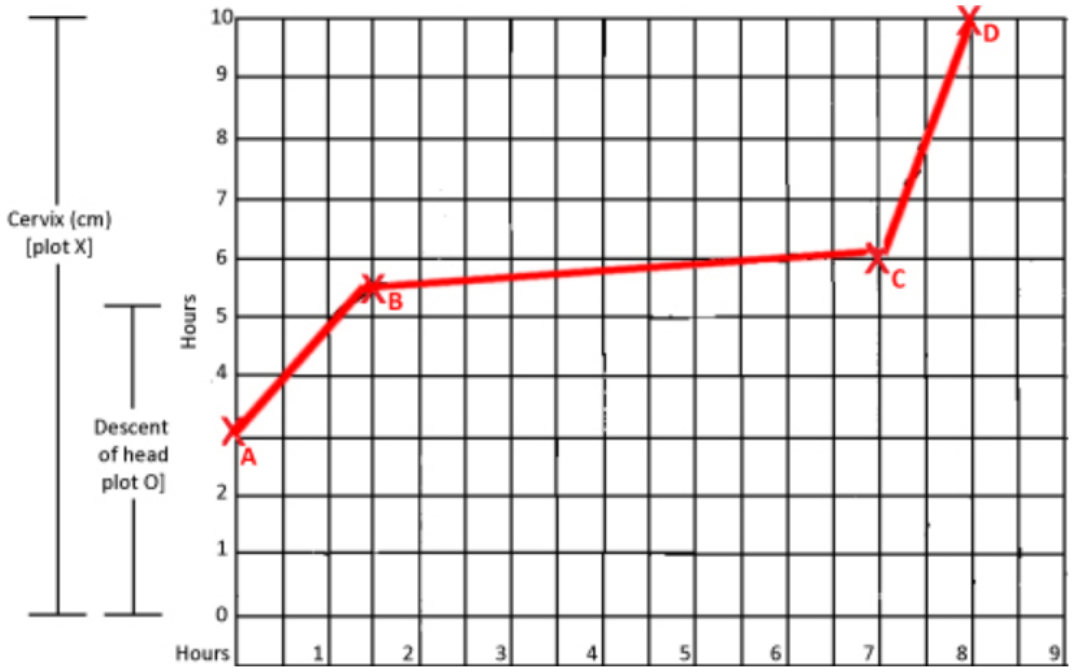

Figure 9: Example of secondary arrest

Arrest of descent is defined as arrest greater than 1 hour in nullipara and multiparas.in this progressive fetal descent stops during pelvic division of labour.

Etiology: CPD and malpositions. The incidence of operative delivery is very high.

Treatment: Most cases undergo caesarean delivery and instrument delivery is very high.

Failure of descent is no descent in deceleration phase or second phase. This disorder is serious. In 98% it is associated with some other kind of major disorder.

Etiology: The most important cause is CPD. Fetal malposition is also commonly associated.

Treatment: In these case the verification of fetopelvic relation is commonly done when CPD is found out. Patient most commonly go for caesarean delivery

Precipitate labour disorders (labour which is completed within 3 hours)

It is extremely rapid labour and delivery. It may result from an abnormally strong uterine and abdominal contraction or rarely from the absence of painful sensations and thus lack of awareness of vigorous labour. It is frequently followed by uterine atony (Williams 25th edition) [49].

Precipitate dilatation

Nullipara: it is maximum slope of dilatation 5cm/hr or more.

Multipara: it is maximum slope of dilatation 10cm/hr or more.

Precipitate descent

Nullipara: maximum slope of descent of 5cm/hr or more. (model value 3cm/hr, Std. deviation 6 cm/hr) Multipara: maximum slope of descent of 10cm/hr or more. (model value 5cm/hr, Std. deviation 14 cm/hr) Treatment: to stop any oxytocin being administered.

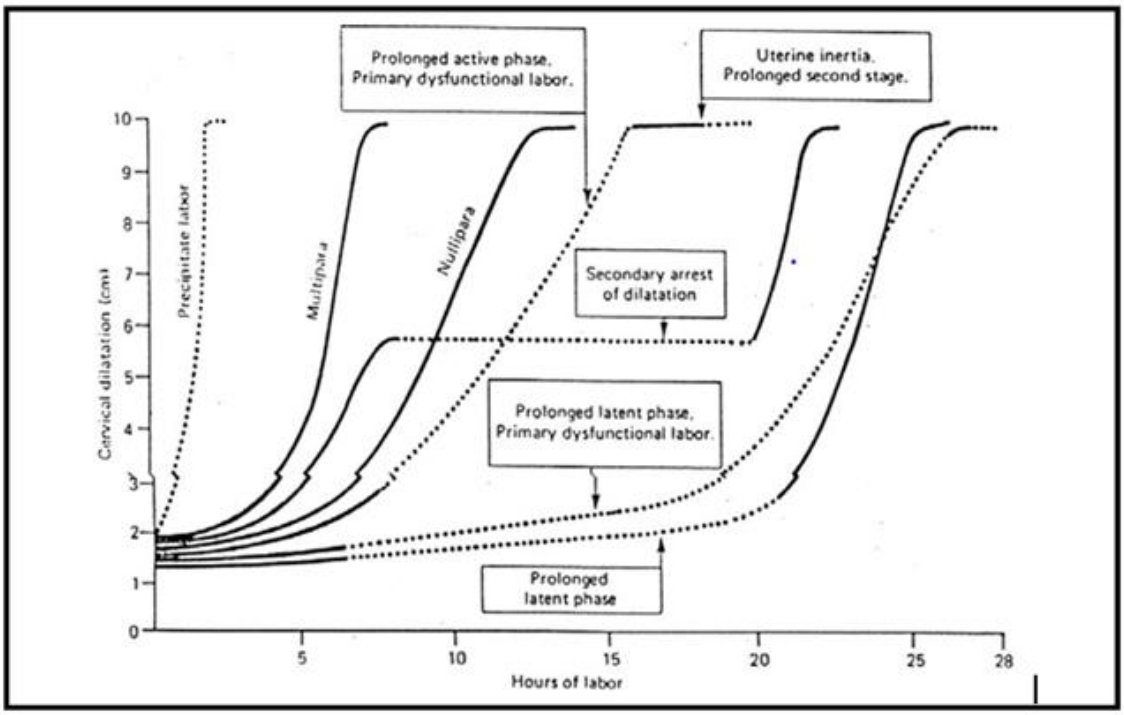

Figure 10: Major deviation from normal progress of labour

SECOND STAGE LABOUR

Fetal descent largely follows complete dilatation. Moreover second stage incorporates many of cardinal movements necessary for fetus to negotiate the birth canal.

It comprises of:

1. Passive second stage of labour

It starts from full dilatation of the cervix antecedent to, or in the absence of, involuntary expulsive contractions.

1. Active second stage

In this stage the baby is visible, there is intensive contractions and the cervix becomes fully dilated.

There is active maternal effort and fully dilated cervix in the absence of expulsive contractions.

PROGRESS IN THE SECOND STAGE

Nulliparous women

In women in their first labour, delivery would be expected within 3 hours of the commencement of the active second stage with conduction analgesia, and delay is defined as an active stage that has lasted more than 2 hours. If birth is not imminent then a management plan should be made for consideration of operative delivery.

Parous women

Delivery is expected to occur within 2 hours of the start of active second stage with conduction analgesia, and delay is diagnosed if after 1 hour delivery is not imminent.

Etiology: contracted pelvis, large fetus or conduction analgesia, persistent occipitoposterior position.

Treatment: low outlet forceps but difficult forcep can be avoided.

Table 2: Summary of findings and diagnosis

Findings	Diagnosis
Cervix not dilated No palpable contractions/infrequent contractions	False labour
Cervix not dilated beyond 4 cm after 8 hours of regular contractions	Prolonged latent phase
Cervical dilatation to the right of the alert line on the partograph:	Prolonged active phase
▪ Secondary arrest of cervical dilatation and descent of presenting part in presence of good contractions.	Cephalopelvic disproportion
▪ Secondary arrest of cervical dilatation and descent of presenting part with large caput, third degree moulding, cervix poorly applied to presenting part, oedematous cervix, ballooning of lower uterine segment, formation of retraction band, maternal and fetal distress.	Obstruction
▪ Less than 3 contractions in 10 minutes, each lasting less than 40 seconds.	Inadequate uterine activity
▪ Presentation other than vertex with occiput anterior.	Malpresentation or malposition
Cervix fully dilated and woman has urge to push, but there is no descent.	Prolonged expulsive phase

Table 3: Management of labour aberrations

Dysfunctions	Preferred treatment	Exceptionally
Prolonged latent phase	Therapeutic rest	Oxytocin
Protraction disorder	Expectancy and support	Caesarean section
With CPD	Caesarean section	No exceptions
Arrest disorder without CPD	Oxytocin	Rest for exhaustion

Morbidity from prolonged labour includes:

- Increased hazard of instrumental delivery and caesarean section

- Traumatic delivery resulting in maternal and fetal morbidity, e.g. shoulder dystocia
- Ketosis resulting from dehydration and anaerobic metabolism
- Third stage complications such as postpartum hemorrhage and retained placenta
- Uterine tears with hysterotomy, uterine rupture
- Fistula formation resulting from prolonged compression of the anterior vaginal wall and bladder by the presenting part.
- Sepsis either intrapartum or postpartum chrioamniotis.
- Lower extremity nerve injury.
- Peripartum fetal sepsis
- Caput succedaneum and moulding
- Mechanical trauma such as nerve injury, fractures and cephalohematoma.

THE PARTOGRAPH

A partograph was designed by the World Health Organization for use in developing countries (Dujardin and co-workers, 1992). Labour is graphed, and analysis includes use of alert and action lines [58].

Dysfunctional labour can be diagnosed by vigilant and frequent assessment of the power, passage and the passenger. The partograph is a means of graphically displaying this intrapartum information in a clear and focused way and facilitates effective transfer of information. The partograph is a record of all of the observations made on a woman in labour. The central feature consist of the graphic recording of the dilatation of the cervix as assessed by vaginal examination. The WHO partograph has been modified and revised to make it easier to use. The partograph has been in use for longer than 20 years and its implementation has been shown to be associated with a reduction in prolonged labour, reduction in the augmentation of labour and a reduction in sepsis. WHO has recommended the use of the Partograph which is a low tech paper form that has been considered as an effective tool for the early detection of fetomaternal complication during child birth. However, the continued use of the partograph in resource-rich settings has been questioned.

Although recent Cochrane review has demonstrated that routine use of a partograph does not convey any effect on caesarean section rate nor other aspects of care in labour in developed countries but it still remains gold standard tool for labour monitoring in settings with poorer access to healthcare resources. Reduction of caesarean sections rates were demonstrated with partograph usage in developing countries.

The partograph is commenced following accurate diagnosis of established labour. The expected progress in labour is 1.2 cm/hr in primigravid and 1.5 cm/hr in multigravid women. An action line of 4 hours is used, as earlier action lines increase interventions. If progress is

to the right of the action line, then labour is considered to be prolonged and action should be taken. The NICE guidance on caesarean section states that a 4-hour action line reduces the rate of caesarean sections.

MODIFIED WHO PARTOGRAPH

The WHO partograph has been modified and revised to make it easier to use. The latent phase has been removed, WHO introduced the 'modified' partograph in the year 2000 the latent phase was removed and plotting on the partograph begins in the active phase when the cervix is 4 cm dilated to alleviate problems of confusing it with false labour and unnecessary interventions.

The latent phase is excluded in this partograph. It is based on the following principle: Active phase of labour commenced at 4 cm of cervical dilatation. Cervical dilatation is plotted on vertical line on the left side of the graph in cms (4 to10 cms) against elapsed time on the horizontal line in hours. Onset of labour pains and cervical dilatation of 4 cms is taken as 0 hours

A guide line is drawn from 4 cms dilatation upwards at a slope of 1 cm/hr to full dilatation. This is termed as alert line as it warns about delayed progress of labour. Another line is drawn four hours parallel to the right of the alert line termed as action line which indicates need for active interference. The other features are same as the WHO Partograph. During active phase the rate of cervical dilatation should be least 1cm/hr. Conservative management is recommended until cervical dilatation curve reaches alert line.

Evolution of the partograph

The development of partograph provided health workers a pictorial overview of labour which can identify abnormal labour and allow for early intervention.

Majority of guidelines are derived from Friedman's clinical observations of labour. He was amongst the first to emphasize the importance of plotting cervical dilatation (in cm) against time from the onset of labour. Friedman's curve starts at zero cm cervical dilation and used zero hour as the time of onset of strong uterine contractions Friedman concluded that of all the observable features of labour, cervical dilatation was the most reliable and seemed to reflect the overall progress of the labour best. His extensive research on the partograph in labour has laid the basic foundation for further studies, establishing once and for all clear-cut criteria for the diagnosis of dysfunctional labour. The same is, followed in modern day obstetrics with a little modification. This was based on the cervical dilatation as a function of time.

The method consisted of inscribing multiple isolated observations of cervical dilatation against time on simple XY co-ordinates. Square ruled graph is used in which the abscissa is the elapsed time in hours from the onset of labour and the ordinate is the cervical dilatation in centimeters. The points were joined to preceding notations by a straight line. The curves obtained in all normal cases were found to be nearly identical sigmoid curves, varying from individual to individual in the length of its various portions and in the inclination of the center portion.

This data stood the test of time, and several studies at later dates have produced data comparable to their original composite data on the course of labour [60]. The phenomenon of labour lends itself to division into 3 parts each of which is clearly different and functionally special. Each can be easily recognized and each is affected

by different factors and each responds in a singular manner to various influences and is subject to its own set observations.

For the sake of convenience, these functional divisions of labour are considered as physiologic objectives:

Philpott and Castle (1972) devised a composite graphic labour record on which all details of the progress of labour as well as the fetal and maternal condition could be recorded on a single piece of paper against a time scale. It is an improved version of labour curve. He introduced the action and the alert line [61].

The objective of this graphic analysis was to fulfill the special needs of paramedical personnel caring for maternity patients. There were huge problem faced by Philpott and Castle as most of the deliveries were carried out by midwives and maternity assistants. There was a clear need for establishing simple and accurate guiding principles. They made an important and significant contribution to the practice of obstetrics in a way – especially as it is practiced in underdeveloped areas or wherever personnel are limited in number, sophistication or skills. Arbitrary critical limits of total duration of labour or nebulous concepts of uterine inertia, both of which are difficult to use and of limited value even in expert hands, have here given way to a very efficient and simple technique for plotting cervical dilatation time on a standard graph.

As the curve evolves, the abnormal labour pattern will cross the alert Line and indicate to observe that a problem is likely to exist. There is clear evidence that labour crossing the action line are commonly associated with cephalopelvic disproportion.

Two major drawbacks appear to limit the usefulness of this method:

First it does not take into account the latent phase or its normal extension. Philpott and Castle acknowledged this problem, but accepted this limitation because they were unable to define the beginning of labour in most of their cases. This appears to be a special problem inherent in underdeveloped countries. Nevertheless, it is probable that many of the patients who cross the Alert Line are actually in the latent phase. This would account for a large proportion of patients – 50% in their series – who underwent active dilatation of the cervix and subsequently delivered without complications. On this basis, the Alert line is too sensitive because it designates so many normal labour as abnormal.

Secondly, this approach does not consider progressive descent at the same time. Thus, disordered descent patterns are not recognized.

If cognizance of the contributions of the latent phase are not taken in consideration, there can be high frequency of false positive cases that comprise patients with perfectly normal labours who are considered to be abnormal merely on the basis of their having crossed the Alert Line. One the other hand ignoring the descent curve, there can be some serious labour aberrations that are missed.

The alert line was later modified to start from 3 cms dilatation upwards.

Studd, J. (1973, 1975) modified Philpott's graphic record and developed five separate patterns representing normal labour progress in patients admitted at 5 different levels of cervical dilatation [16]. He constructed "Labour stencils' for the purpose of identifying the probable pattern of progression according to the degree of dilatation achieved at the time of admission when the patient is in labour.

Again, because of the confusion surrounding the time of onset of labour, these graphs were begun using the time of admission on labour as the starting point. Curves showing

the average course of cervical dilatation were constructed for various degrees of cervical dilatation on admission. These composite data were then etched onto a stencil for use in conjunction with the aforementioned graphic records. The stencils were designed to provide a mean to identify patients with disordered labour.

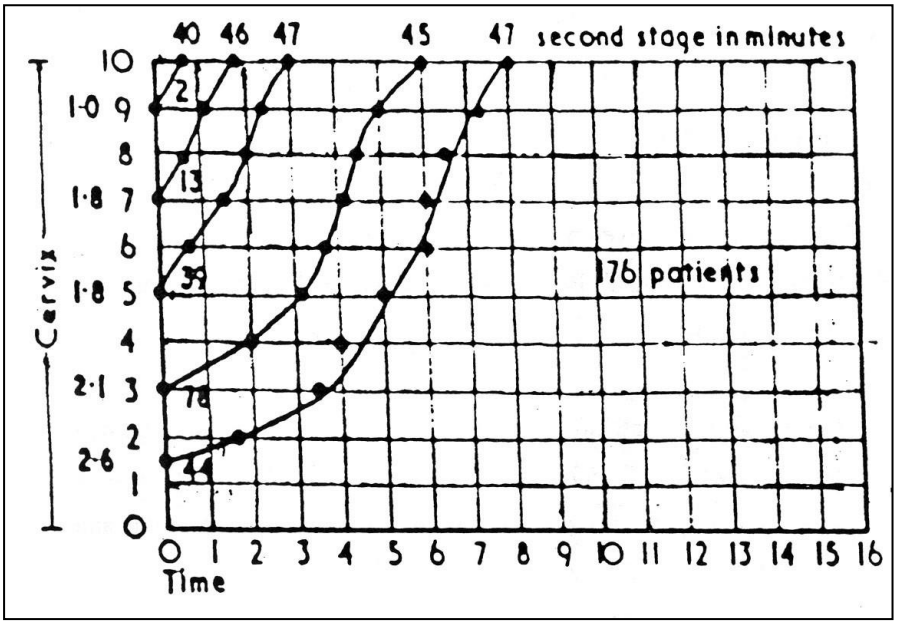

Figure 11: Studd's labour stencil

Here , five different patterns representing normal labour progression were put from groups of patients admitted at five different levels of cervical dilatation i.e. 0.2 cm, 3-4 cm, 5-6 cm, 7-8 cm and 9-10cm. The curves transcribed onto acrylic stencils were used as follows. When the patient was admitted in labour, the cervical dilatation was assessed. The appropriate stencil line was drawn according to the cervical dilatation completed up to that time. This line expressed the expected progress for that patient.

Studd et al.,(1973) emphasized that the labour pattern straying 2 hours or more to the right of the projected line may be taken as abnormal and required uterotonic stimulation. While there were issues with the recommendation for stimulation without a clearer idea of the type of disorder present and its causation, it seems still

commendable that this approach provides a very direct and simple means for identifying labours that may be abnormal [16].

However, this technique was very sensitive, it designated many normal labour as dysfunctional. Indeed, both normal and abnormal latent phases would be flagged as seriously abnormal. This technique especially mislabels all these gravidas whose cervix may have reached 3 cms or more in the latent phase.

While this technique is unlikely to overlook an abnormality of dilatation, it cannot distinguish protracted dilatation from arrest. Moreover it ignores very serious descent problems entirely.

Shirish and Pravin (1977) constructed a NORMOGRAM with the alert line two hours to the right of, and parallel to, the phase of maximum slope. The action line is two hours to the right of and parallel to the alert line. They found it more applicable to the regional population as compared to Philpott and Castle partograph.

The other advantage of these lines over the Philpott and Castle alert and action lines was that, since these lines were drawn parallel to the phase of maximum slope and not at zero time, the latent phase of labour was defined.

Dujardin et al., (1992) with his study involving 1022 pregnant women at Pikine, Senegal, demonstrated the efficacy of alert and action lines and highlighted the usefulness of Partograph and need for medical intervention as soon as alert and action lines are crossed [58]. His partograph was based on a World Health Organization model had been used but a lag time of 3 hours instead of WHO recommended 4 hours between the alert and the action lines was selected. It was shown that among women who crossed the alert but not the action line, neonatal resuscitation was four times more

likely than for the normal labour group. The fresh still birth rate was also high. Those women who crossed both the lines, the fresh still birth rate was 10 times higher than for the normal labour group.

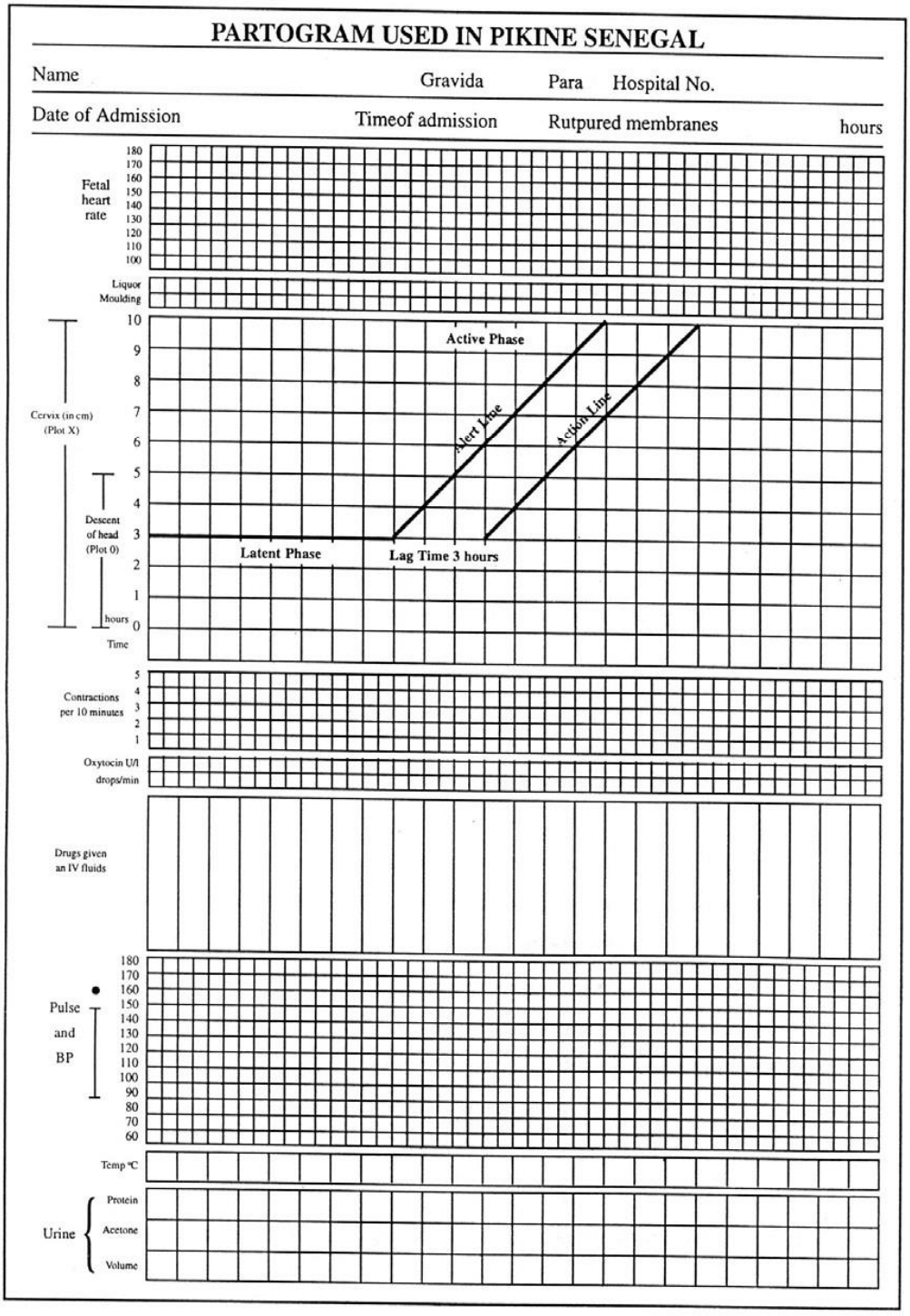

Figure 12: Partograph used in Pikine Senegal

The World Health Organization produced and promoted a partograph with aim to improve labour management and reduce maternal and fetal morbidity in 1987 as part of the Safe Motherhood initiative, launched in 1987. Since then WHO has published three different types of partograph. The first of these partograph also known as composite partograph included latent phase of 8 hours and an active phase starting 3 cm cervical dilation. It has alert line with a slope of 1cm/h and action line 4 hr. to the right and parallel to alert line. It also had space to record descent of fetal head, maternal condition, fetal condition and medicines administered.

Figure 15 shows the WHO model of the partograph. It's had following principle on which it has been constructed:

- The latent phase of labour i.e. from 0-3 cm should not last longer than eight hours.
- The active phase of labour commences at 3 cm dilatation.
- The rate of dilatation should not be less than 1 cm per hour in the active phase of labour. Active phase considered as cervical dilatation of more than 3 cm. The 'alert line' drawn from 3 to 10 cm represents this rate of dilatation.
- Similar to Philpott and Castle's original description, the 'action line' has been retained in the active phase of labour and is drawn 4 hours to the right of and parallel to, the alert line. As the WHO policy states "A lag time of 4 hours between a slowing of labour and the need for intervention is unlikely to compromise the fetus or the mother and avoids unnecessary intervention.
- The central feature is the cervicograph which plots cervical dilatation against time.
- Vaginal examinations should be performed (four hourly examination is recommended) as frequently as is compatible with safe practice.

The partograph does not replace adequate screening of women on arrival in labour to exclude conditions that require urgent attention or immediate transfer. It is designed to detect deviations from normal delivery that develop as labour progresses.

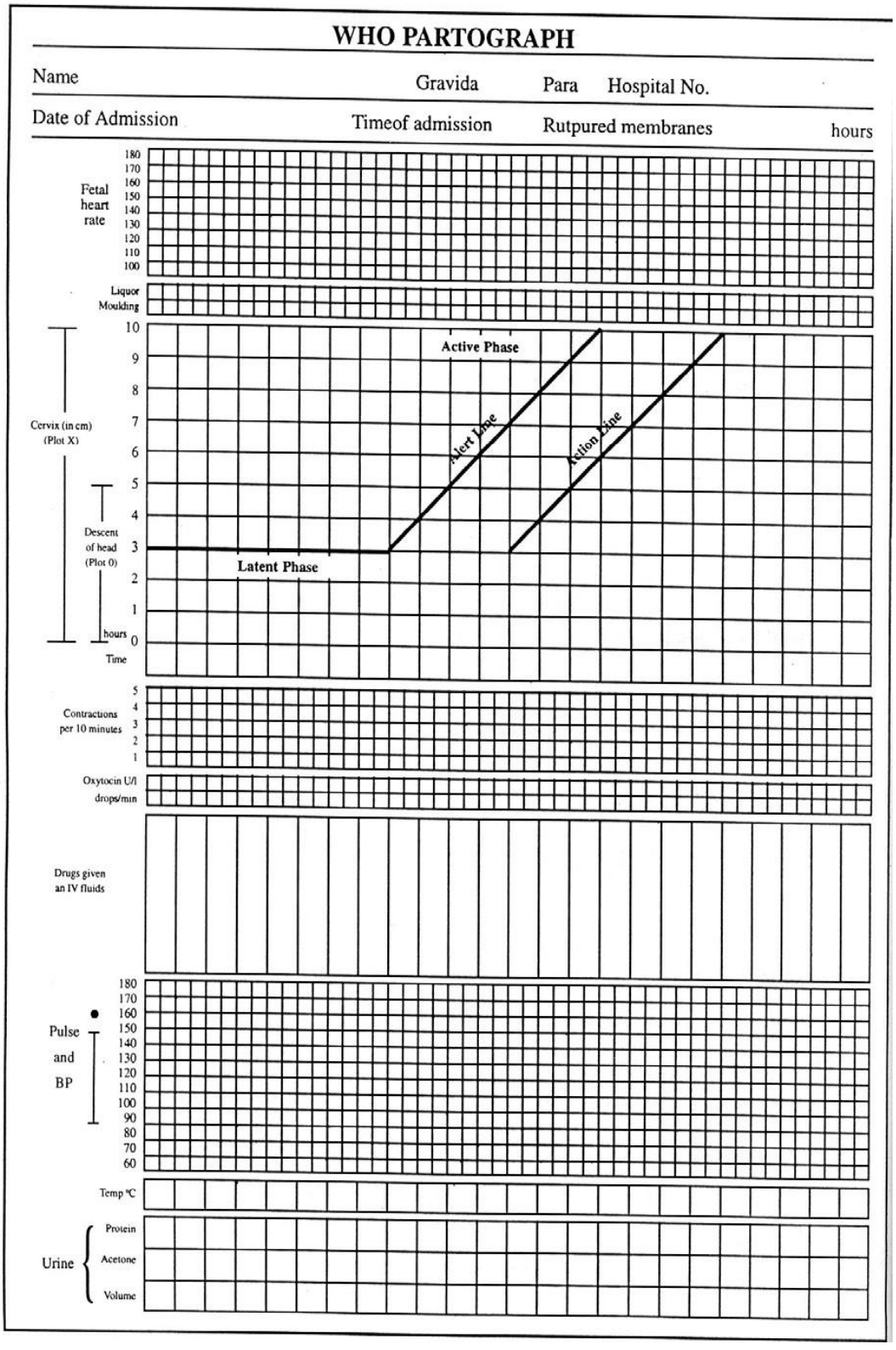

Figure 13. : WHO Partograph

WHO recommended this partograph in the management of labour in all patients. This WHO partograph was verified in a multicentre trial in South East Asia involving 35,484 women.

With the aid of this partograph and labour management protocol both prolonged labour (from 6.4% to 3.4% of labour) and the proportion of labour requiring augmentation (from 20.7% to 9.1%) were reduced. Also Emergency caesarean sections fell from 9.9% to 8.3% and intrapartum still births from 0.5% to 0.3%.There was also reduction almost 59% in cases of postpartum sepsis due to reduced vaginal examinations. This resulted in improvement in the maternal morbidity and fetal mortality and morbidity among both primigravid and multigravid patients. The participants in the WHO trial came to a consensus that the partograph enhanced the disciplined communication about the management of labour and freed midwife's time hence was an important part of the partograph's success as added time can be committed to "companionship".

The world health organization partograph visibly differentiated normal from abnormal progress in labour and identified those women likely to require intervention. Its use in labour wards has been recommended.

If the labour curve crosses the alert line possibility for cephalo-pelvic disproportion (CPD), or the need for oxytocin was evaluated. If the labour curve crossed the action line, a definitive line of management in the form of augmentation with oxytocin or caesarean section was instituted.

Before administering oxytocin, it is strongly suggested to make sure that absolute contraindications viz. CPD, anomalous fetal positioning, fetal distress, previous marks of uterine etc. should be eliminated. In modified WHO partograph (2000), the latent phase was kept out and at 4 cm of cervical dilatation, the active phase was set up

without altering other parameters. As chances of interventions because of extended latent phase and difficulty reporting in transferring the dilatation from latent phase to active phase, hence it was excluded.

PARTOGRAPH IN NORMAL LABOUR

Partography is a representation of labour in a statistical and graphical pattern. 'Partograph' word is made up a Latin word 'Parturio' and a Greek word 'Gramma' meaning labour and diagram respectively. Friedman (1954) introduced the modern partograph where for the Ist time a graphic depiction of cervical dilatation during labour was analyzed as a function of time. Data was recorded from a large number of patients and a graphic record was presented. Amongst all observable aspects, cervical dilatation as a function of time was concluded as the most accurate and reliable feature showing thorough and complete progression of labour.

CONSTRUCTION OF A PARTOGRAPH

The management of labour is greatly improved by Graphic recordings in the individual and its administration in the labour ward. These are more efficient than lengthy written notes and offer a pictorial display of all the essential features of labour and immediately alert the attending obstetrician to abnormal developments. Partographs are educational in that all interdependent variables of labour are presented on a single sheet of paper with a central cervicograph, which aids as a visual computation of these factors. These are useful in the busy peripheral hospitals and can be are both timesaving and more efficient.

The partograph can be attached to a clipboard at the foot of the patient's bed in the labour ward. The attending obstetrician or the nurse can make the recordings. The key feature is the cervicograph record of labour progress. The details are given in the order in which they appear on the graph.

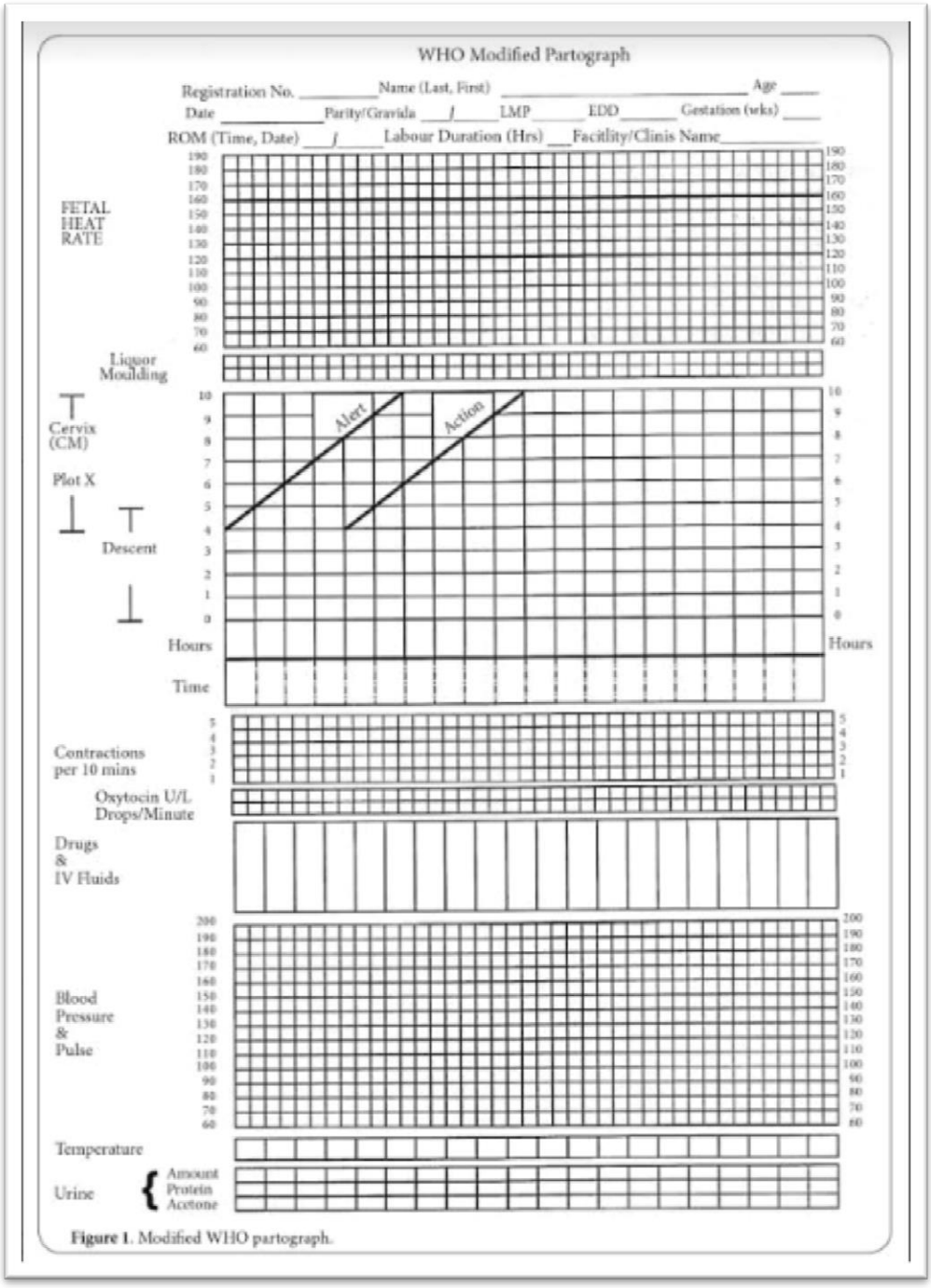

Figure 1. Modified WHO partograph.

Fig. 14: Modified WHO Partograph

Components of Partograph

Personal information: Information including name, gravida, para, and registration/hospital number, date of admission, time of admission, and time of ruptured membranes is written at the top of the graph.

The partograph is divided into four parts each dealing with –

1. Fetal condition
2. Progress of labour
3. Treatment
4. Maternal condition

1. Fetal Condition: Fetal heart rate, membranes, liquor (amniotic fluid) and moulding of the fetal skull bones give information about fetal condition during labour.

Fetal Heart Rate: Immediately below the patient's identification details, you record the Fetal Heart Rate initially and then every 30 minutes. The scale for fetal heart rate covers the range from 80 to 200 beats per minute. Listening to and recording the fetal heart rate is a safe and reliable way of monitoring how the fetus is doing. The fetal heart rate is recorded at the top of the partograph. It is recorded every half hour in the first stage of labour, but more frequently at the end of the first stage and in the second stage. Each square for the fetal heart on the partgraph represents 30 minutes.

Liquor: Below the fetal heart rate there are two rows and the first row is for liquor. Amniotic fluid is observed and recorded at each vaginal examination as follows: clear ("C"), blood-stained ("B") or meconium-stained ("M"). If the membranes are not ruptured, record "I" for intact.

Moulding*:* It is the row below the liquor. It is important as it alerts one to mounting evidence of disproportion and is often the only sign of fetal distress in this complication. Because moulding occurs first at the junction of the occipito-parietal bones and later at the parieto-parietal junction it is of value to score the degree of moulding at these two junctions separately. This is recorded as follows: bones are separated and the sutures can be felt easily (o); bones are just touching each other (+); bones are overlapping (++); bones are overlapping severely (+++).

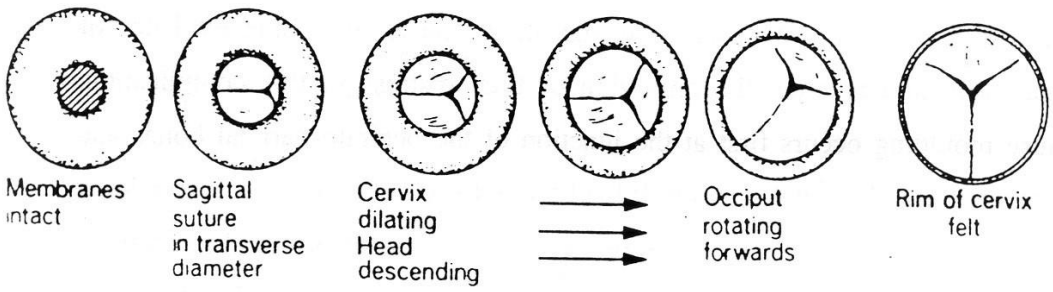

Fig.15: Dilation of cervix and rotation of fetal head

2. Progress of labour: Vaginal examination and assessment of vaginal dilatation are made as soon as the patient is admitted to the labour ward, unless there is some obstetric contraindication. . As cervical dilatation is the most important indicator of progress of labour, it is proper that the cervicograph should be the most dominant part of the labour charts, once labour is well established four-hourly vaginal examination are done to assess the cervical dilatation. The initial vaginal examination done on admission is a thorough pelvic exploration, but to minimize infection subsequent examinations should assess cervical dilatations, position of the head and the degree of moulding.

Along the left side, there are squares from 0 to 10, each representing 1 cm dilation along the bottom of graph are numbers 0 to 12 each presenting 1 hour.

In modified WHO partograph active phase starts from 4 cm to 10 cm (full cervical dilatation. The dilation of cervix is plotted as "**X".**

When a woman is admitted in active phase the cervical dilatation is plotted on the alert line. If labour progress is satisfactory, the plotting of cervical dilatation will remain on the left of alert line.

Cervical dilatations should be measured by vaginal examination four-hourly when the patient is in established labour and more frequently when problems require an early decision. Effacement of the cervix is best measured by an assessment of the length of the cervical canal.

The position of the fetal head also has to be recorded which is done by recording the figure relating the occiput to a point on the clock.

Descent of head

The fetal head level has to be assessed and recorded by bi-manual abdominal palpation and should be described as the number of 'fifths' of head palpable. Hence it is preferred to note the 'station' of the head with reference to the ischial spines assessed at vaginal examination for several reasons:

1. Abdominal assessment excludes the variability due to caput and moulding.
2. It excludes the variability produced by a different depth of pelvis.
3. Assessment in fifths is quantitative and easily reproducible.
4. The part of the head which still has to enter the pelvis and it should be assessed.

For labour to progress well, dilatation of the cervix should be accompanied by descent of the fetal head. When plotting decent of the head, use a separate symbol to for cervical dilation.

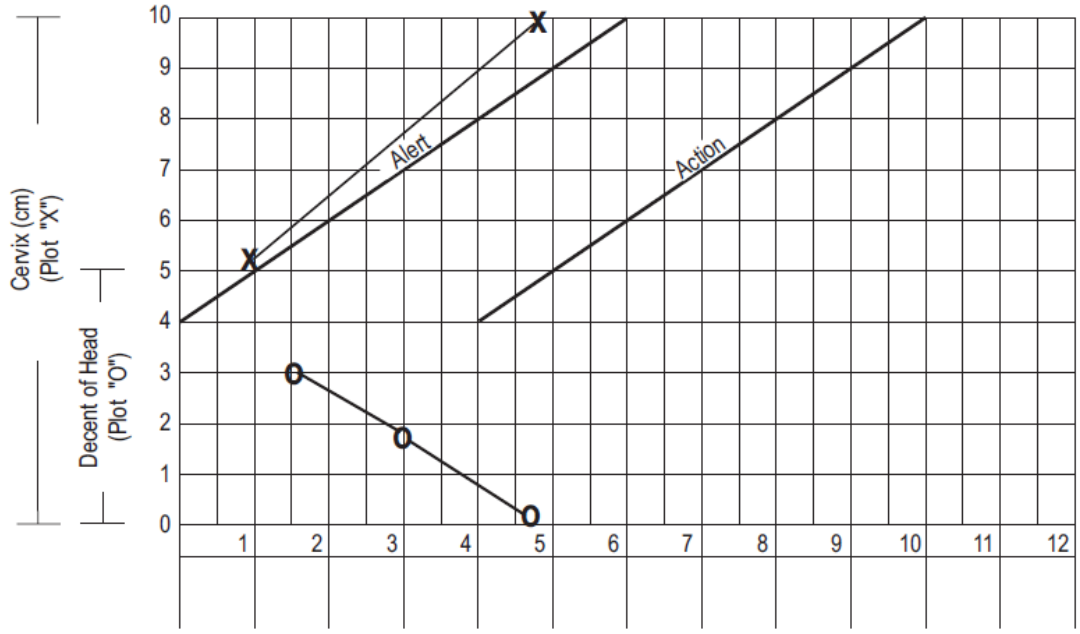

Fig. 16: Progressive descent of the head

For convenience, the width of five fingers is a guide to the expression in fifths of the head above the brim. A head which is mobile above the brim will accommodate the full width of five fingers (closed) .The level of the head is best measured by abdominal palpation as the number of fifths above the pelvic brim (Crichton). The amount of head felt suprapubically in fingerbreadths is assessed by placing the radial margin of the index finger above the symphysis pubis successively until the groove of the neck is reached.

As the head descends, the portion of the head remaining above the brim, will be represented by fewer fingers (4/5th, 3/5th etc.). It is generally accepted that the head is engaged when the portion above the brim is represented by 2 fingers' width or less. Descent of the head should always be assessed by abdominal examination immediately before doing a vaginal

examination so that one knows where to expect to feel the head during the vaginal examination.

On the left side of the partograph is descent written with numbers from 5 to 0. Descent is plotted with "**O**" on cervicograph.

Concept of Alert and Action Lines*:*

In normal labour during active phase, plotting of cervical dilatation will remain on the left of or on the alert line. If the rate of cervical dilatation is less than 1 cm/hr, the labour curve will cross the alert line. This should alert the obstetrician to the possibility of abnormal labour. An action line is drawn four hours to the right of, and parallel to the alert line. This allows for the time to transfer the patient without impairing the success of the essential active management, and also allows many normal patients to delivery vaginally without active intervention as suggested by the WHO policy. If the labour curve crosses the action line, then definite action is strongly recommended for the management of labour.

Although the alert and action lines were originally designed for the primigravidae, we also use them in the management of multigravid patients who normally progress more quickly than the primigravid patients. The difference in application occurs at the time of crossing the action line, for the use of oxytocic augmentation can be hazardous in the multigravid patients.

Uterine contractions

Good uterine contractions are necessary for progress of labour. Normally contractions become more frequent and last longer as labour progresses. Contractions are recorded every 30 minutes on the partograph. Below the time line and at the left hand side is written "contractions per 10 minutes". The squares in this section of the partograph are numbered from1–5. Each square represents one contraction so that if 2 contractions are felt in 10 minutes, 2 squares will be

shaded. The squares below provide the key to recording the strength of contractions on the partograph. Dots represent mild contractions of less than 20 seconds' duration.

Diagonal lines indicate moderate contractions of 20–40 seconds' duration. Solid colour represents strong contractions of longer than 40 seconds' duration.This feature in the assessment of the progress of labour becomes of particular importance, in recognizing types of uterine inefficiency and also when oxytocin stimulation is used. The frequency of contractions is recorded half hourly as the number of contractions in the last 10 minutes of each half-hour period and this number of block (1 to 5) shaded in accordingly. Duration of contractions in seconds is noted above each shaded column of blocks.

Treatment

a) Oxytoxic simulation: When oxytoxic simulation is used for induction of labour or the stimulation of inefficient labour, this can be recorded in the two lines provided. In the first line marked "Oxytocin" dose should be documented as mU/min and in the next line the number of drops per minute should be noted down.

b) Drugs and Intravenous Fluids*:* These are recorded in the space provided and ticked off when they are given or started.

Maternal condition

1. Vital parameters: Pulse, blood pressure and temperature are documented in these columns.

2. Urine*:* Volume of the urine, albumin, acetone and glucose content are recorded every time urine is passed. This has particular importance in patients receiving oxytocin because of the antidiuretic effect of oxytocin.

Delivery notes enumerating mode of delivery, duration of labour, details about the third stage of labour, placenta, condition of the baby and as per score at one and five minutes and condition of the mother immediately and after two hours are noted down.

Implementation of the partograph

Effective implementation of the partograph to cause a significant reduction in the maternal and fetal mortality and morbidity rated requires the fulfillment of the following criteria:

1. There should be routine use of partograph including the essential features necessary to be monitored in labour, such as the one drawn by the World Health Organization. This should be implemented initially in teaching hospitals and referral centers and then extended to the peripheral units. Research into all the aspects of the partograph on labour management and adverse outcomes in labour should also be an ongoing process.

2. The presence of a formal healthcare system with adequate staff who fulfill minimum training criteria is necessary. The staff should have adequate training in midwifery to observe and conduct normal labour and detect deviations from the normal. They should be able to perform vaginal examinations in labour correctly assess cervical dilatation, which implies that basic hygiene should be guaranteed in these hospitals or clinics. They should then be trained in the use of a partograph to be able to correctly plot the various parameters, so that they are able to indicate when referral is appropriate.

3. The presence of a well-equipped and staffed referral system – with essential obstetric facilities like that for caesarean section has to be in place in order to deal effectively with patients with abnormal partograph.

Materials and methods

MATERIALS AND METHODS

The present study was a prospective observational study done on 351 pregnant women at term in labour admittedat R.L Jalappa Hospital and Research Centre attached to Sri Devaraj Urs Medical College, Department of Obstetrics and Gynecology, Tamaka, Kolar-563101 during June 2017– August 2018.

STUDY DESIGN: A prospective observational study.

SAMPLE SIZE: 351 cases.

Sample size was estimated based on the difference in proportion of adverse maternal outcome between Normal and abnormal labour progress from the study by Kunaal K Shinde et al [33]. PPH in group 1 was 1.17% and in group 2 was 13.3%, considering these values at 95% CI, 5% alpha error and 90% power a sample size of 122 + 122 was obtained in each group. Hence a total minimum of 244 subjects was required for the study. Here this study has included 351 women filling the inclusion criteria.

Sample size was calculated using the formula:

$$\text{Sample size} = \frac{r+1}{r}\frac{(p^*)(1-p^*)(Z_\beta + Z_{\alpha/2})^2}{(p_1 - p_2)^2}$$

r = Ratio of control to cases, 1 for equal number of case and control
p^* = Average proportion exposed = proportion of exposed cases + proportion of control exposed/2
Z_β = Standard normal variate for power = for 80% power it is 0.84 and for 90% value is 1.28. Researcher has to select power for the study.
$Z_{\alpha/2}$ = Standard normal variate for level of significance as mentioned in previous section.
$p_1 - p_2$ = Effect size or different in proportion expected based on previous studies. p_1 is proportion in cases and p_2 is proportion in control.

SELECTION OF CASES

Inclusion criteria:

- Gestational age of 37 - 42 weeks
- Singleton pregnancy
- Vertex presentation
- Spontaneous or induced labour

Exclusion criteria:

- Major CPD
- Severe Contracted pelvis
- Previous LSCS
- Malpresentations
- Multiple pregnancy
- APH (antepartum haemorrhage)
- IUGR(Intrauterine growth restriction)
- PROM(premature rupture of membrane)
- IUFD
- Immune compromised status.

Method of collection of data:

A total number of 351 subjects fulfilling the inclusion criteria were incorporated into the study after obtaining informed consent.

Analysis of progression:

On admission to labour room each patient's detailed history was taken regarding age, parity ,duration of pregnancy ,details of previous pregnancy and labour pains and the data were recorded in preformed proforma. Examination was done including general physical

examination and abdominal examination was done to ascertain size of uterus, uterine contractions, presentation, position, engagement of head and condition fetal heart rate were noted. Per vaginal examination and pelvic assessment was done to rule out CPD and to know effacement, dilatation of the cervix, state of membranes, station of head. Routine investigations with NST and obstetric scan was taken for determining fetal well-being. The course of labour in all the parturients were recorded on WHO modified partograph from 4 cm of cervical dilatation in active phase. The women with abnormal course were re-evaluated by senior obstetrician .The decision for operative intervention was taken by senior obstetrician. Individual partograph were were studied to know various aspects related to course of labour and its role in influencind decision making in abnormal progress was assessed. The graphs of the patients were analyzed and were placed in one of the three partographic categories.

Group 1: Patient who delivered when partograph was on or before the alert line.

Group 2: Patient who delivered when partograph crossed was the alert line but before the action line.

Group 3: Patient who delivered when partograph crossed action line.

A record of pulse, BP, temperature was kept. Fetal heart was auscultated half hourly and electronic fetal monitoring was done. Abdominal examination was carried out every 15 min to know about intensity, duration and frequency of uterine contractions. Descent of head was made out by noting the head palpate by 5^{ths} per abdomen. Per vaginal examination was carried out at two hourly intervals to know the progress of labour. Findings were recorded as in dilatation, effacement of cervix, descent of fetal head in relation to ischial spines. Fetal heart monitoring was done by CTG. All these findings were recorded on the partograph. The women with abnormal labour course that is cases falling in group II (crossed the alert line) and III (crossed the action line) were re-evaluated by senior obstetrician and type of labour

abnormality was determined. The cervical dilatation less than <1.2 cm/hr in nulliparas and <1.5 cm/hr in multiparas was considered as protractive active phase. Active phase arrest was taken as no dilatation for 2 hr or more than 2 hours. The cases were evaluated to rule out malpositions and CPD. The cases were seen by senior obestrician and decision of caesarean delivery was taken in cases of CPD. Adequate hydration was maintained for all cases. Women were considered as protracted descent if there was<1cm /hr descent in nulliparas and <2 cm/hr in multigravida. Again CPD malpresentations were ruled out and oxytocin infusion started in cases with inadequate contractions. If there was more than 3 hrs of arrest in nullipara and more than 1 hr in multigravida than women were considered in prolonged deceleration phase. The causes like CPD, malposition and fetal distress were ruled out. Oxytocin augmentation was done. Women were taken for caesarean delivery in case of fetal distress.

If the cervical dilatation was arrested for more two hours in nullipara as well as multiparas than diagnosis of secondary arrest of dilatation was made .these cases were again evaluated by senior obstetrician and causes of CPD, bony dystocia, malpresentation and malposition was ruled out. These women were given Oxytocin infusion in cases with inadequate uterine contractions and caesarean delivery was undertaken in case with severe CPD and bony dystocia.

In women with no descent in deceleration phase or second phase, the diagnosis of failure of descent was made. CPD and fetal malposition was ruled .out. In cases with CPD and malposition women was taken up for caesarean delivery

In each of partograph groups I, II and III, maternal and fetal outcome was analysed and documented. Maternal outcome measures include mode of delivery, type of labour abnormality, post-partum hemorrage, need for blood transfusion, puerperal sepsis, wound

complication and their stay in hospital. The perinatal outcome measures include need for NICU admission, birth asphyxia, neonatal sepsis, neonatal hyperbilirubinemia, birth injuries, meconium aspiration and hypoxic ischemic encephalopathy.

STATISTICAL ANALYSIS

Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 21.0. The Categorical variables was presented in number and percentage (%) and continuous variables was presented as mean ± SD and median. The normality of data was tested by Kolmogorov-Smirnov test. Non parametric test was used in case normality was rejected.

Quantitative variables were compared using Independent T test/Mann-Whitney Test (when the data sets were not normally distributed) between the two groups and ANOVA/Kruskal Wallis test between three groups.

Qualitative data were presented in the form of Proportions and pie diagrams, bar charts were be used to represent graphically. Qualitative variables were correlated using Chi-Square test/Fisher's Exact test.

A probability value (p value) <0.05 was considered statistically significant.

Results

RESULTS

A total of 351 patients were included in this study.

In present study 266 (75.78%) parturient were between 21-30yrs age groups. There were 70 (19.94%) women in the age group of 19 to 20yrs and 15 (4.27%) women in 31-40yrs. The mean age of the patients was 23.81 ± 3.54 (range: 21-26) years.

Table 4: Age group distribution

Age group(years)	Number	Percentage
19 – 20	70	19.94%
21 -30	266	75.78%
31-40	15	4.27%
Total	351	100%

CHART 1: AGE DISTRIBUTION

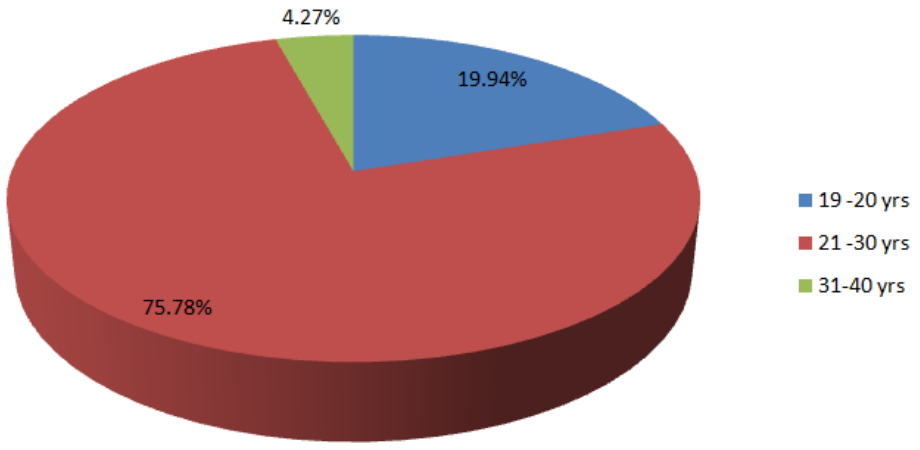

Table 5: Distribution of case according to parity

Parity	Number	Percentage
Primigravida	215	61.25%
Multigravida	136	38.75%
Total	351	100%

In the present study that majority of patients were primigravida comprising 215(61.25%) and rest were multigravida 136(38.75%).

CHART 2: PARITY DISTRIBUTION

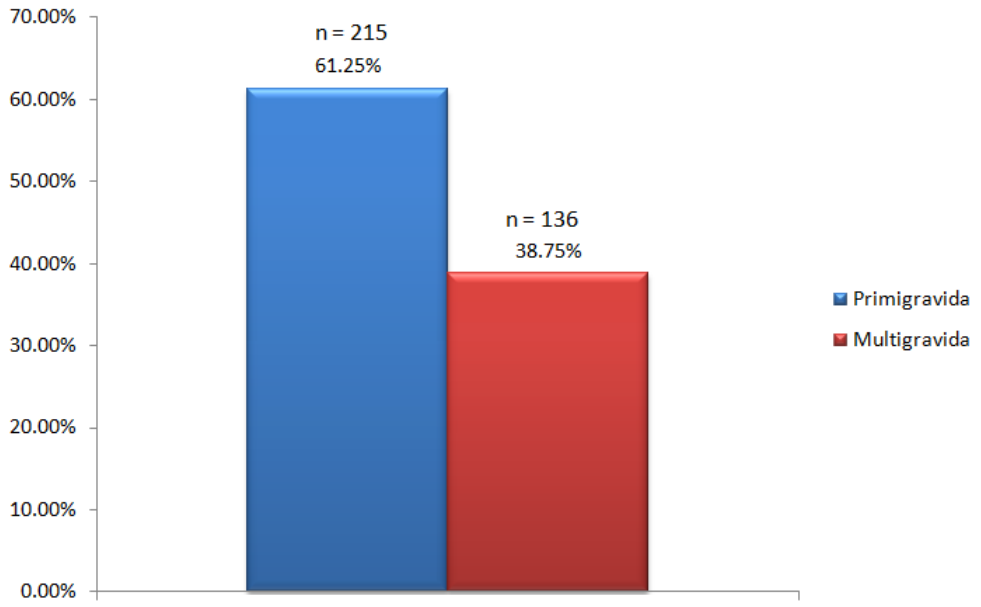

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Table 6: Distribution of cases according to partograph group

Groups	Number	Percentage
I	289	82.34%
II	30	8.55%
III	32	9.12%
Total	351	100%

Out of 351 total women, 289 (82.34%) women delivered when partograph was within alert line (Group I). In Group II, 30 (8.55%) patients delivered and 32 (9.12%) delivered in Group III.

CHART 3: PERCENTAGE WISE DISTRIBUTION

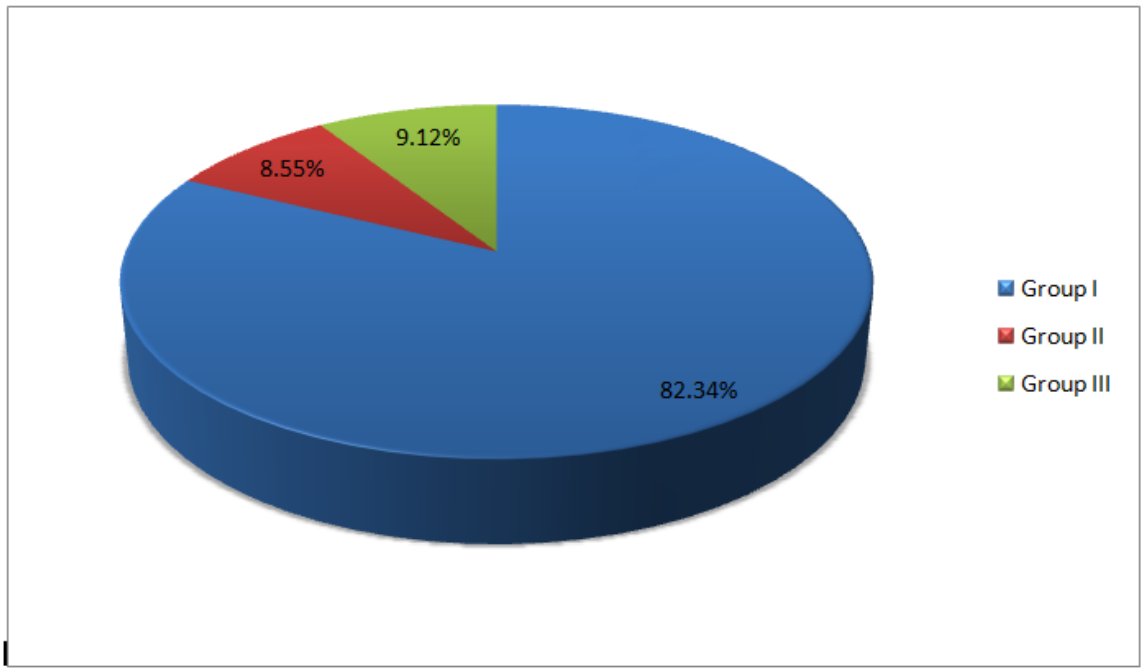


Table 7: Distribution according to induced and spontaneous labour groups.

Parity	Spontaneous/Induced	Number (%)
Primigravida	Spontaneous	177(50.42%)
	Induced	38(10.82)
Multigravida	Spontaneous	108(30.76%)
	Induced	28(7.9%)
Total		351

In the present study 38 (10.82%) primigravida were induced and 177 (50.42%) were in spontaneous group. In multigravida 28 (7.9%) women were induced and 108 (30.76%) belonged to spontaneous labour group.

CHART 4: SPONTANEOUS AND INDUCED LABOUR DISTRIBUTION

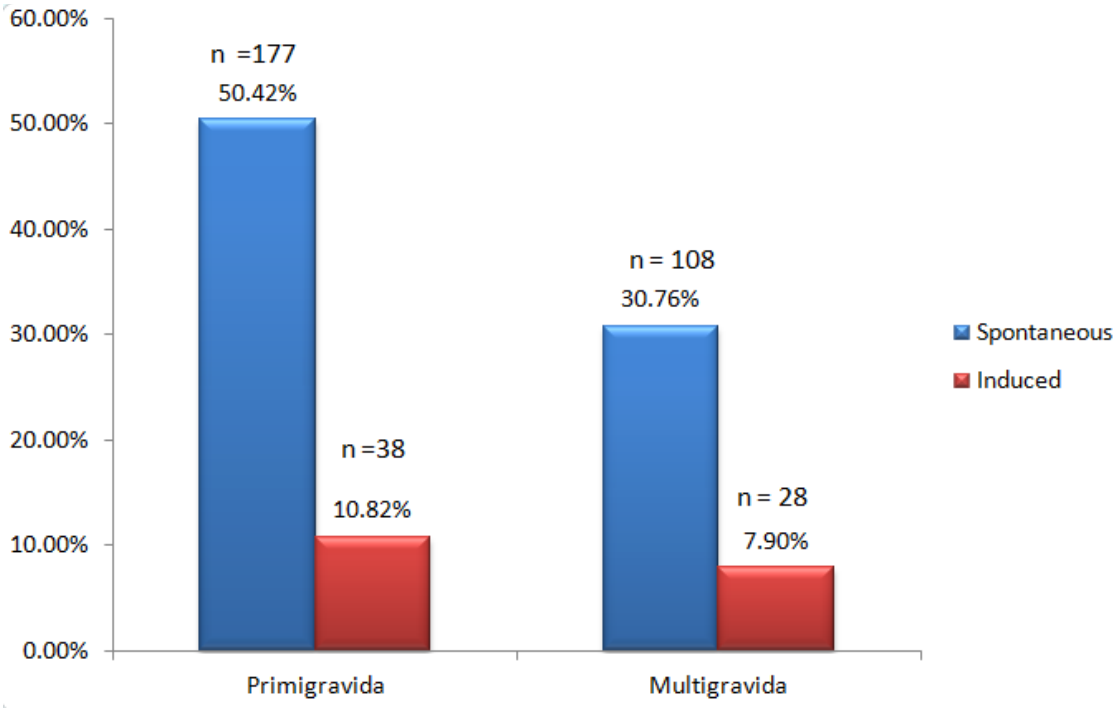


Table 8: Distribution according to labour pattern

Labour pattern	Number	Percentage
Normal	276	78.63%
Abnormal	75	21.37%
Total	351	100%

This study showed 75(21.37%) women out of 351 women had labour abnormalities. 78.63% of women progressed normally.

CHART 5: LABOUR PATTERN DISRIBUTION

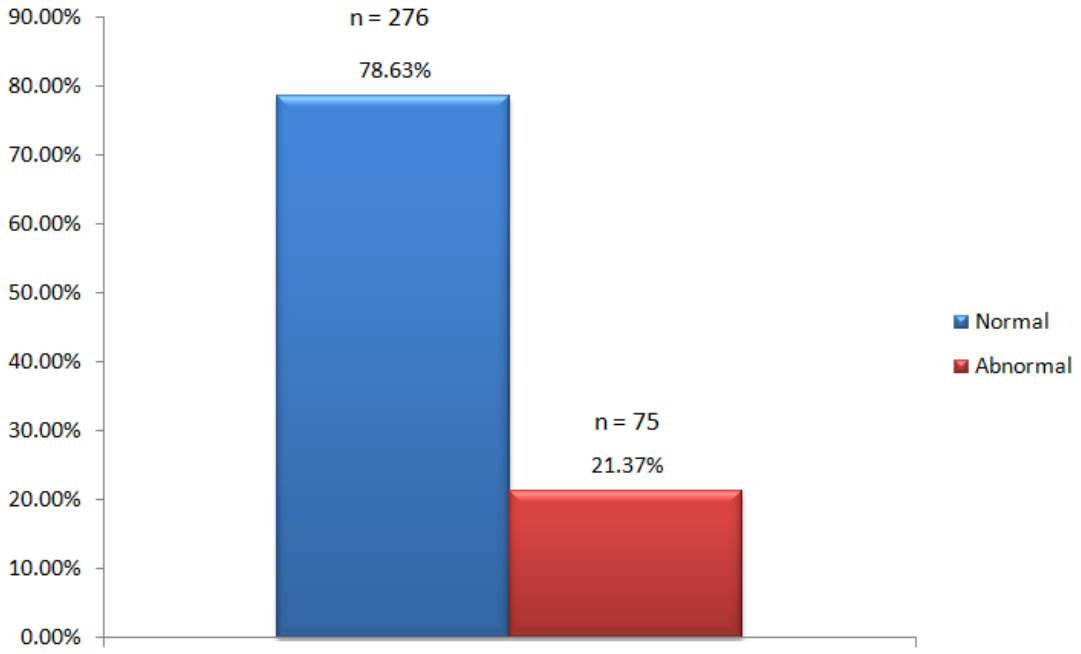


Table 9: Outcome in labour in the study group

Mode of delivery	Number	Percentage
Vaginal delivery	277	78.92%
Outlet forceps delivery	20	5.70%
Ventouse delivery	19	5.41%
Caesarean delivery	35	9.97%
Total	351	100.00%

Out of total 351 study parturients, majority 277 (78.92%) delivered vaginally followed by caesarean 35 (9.97%), 20 (5.70%) were forceps assisted delivery, while 19 (5.41%) needed vacuum delivery.

CHART 6: MODE OF DELIVERY DISTRIBUTION

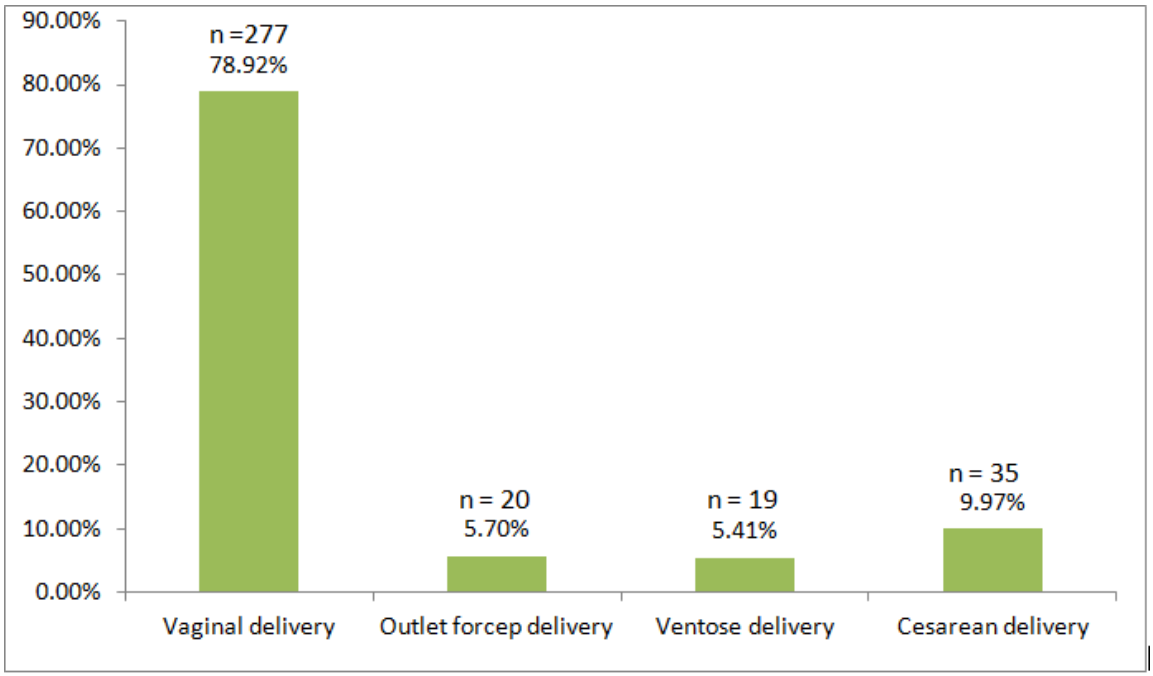


Table 10: Type of labour abnormalities

Labour abnormality	Number	Percentage
Protracted dilatation	5	6.67%
Secondary arrest of dilatation	4	5.33%
Protracted decent	20	26.67%
Arrest of descent	13	17.33%
Failure of descent	1	1.33%
Fetal distress	32	42.67%
Total	75	100%

In this study of 75 cases had abnormal labour, the various abnormal labour patterns observed were: protracted descent 20 (26.67%), protracted dilatation 5 (6.67%), arrest of descent 13 (17.33%) secondary arrest of dilatation 4 (5.33%) and failure of descent 1(1.33%). 32(42.67%) babies had fetal distress on intrapartum electronic fetal monitoring. Protracted descent was the most common abnormality.

CHART 7: TYPES OF ABNORMAL LABOUR DISTRIBUTION

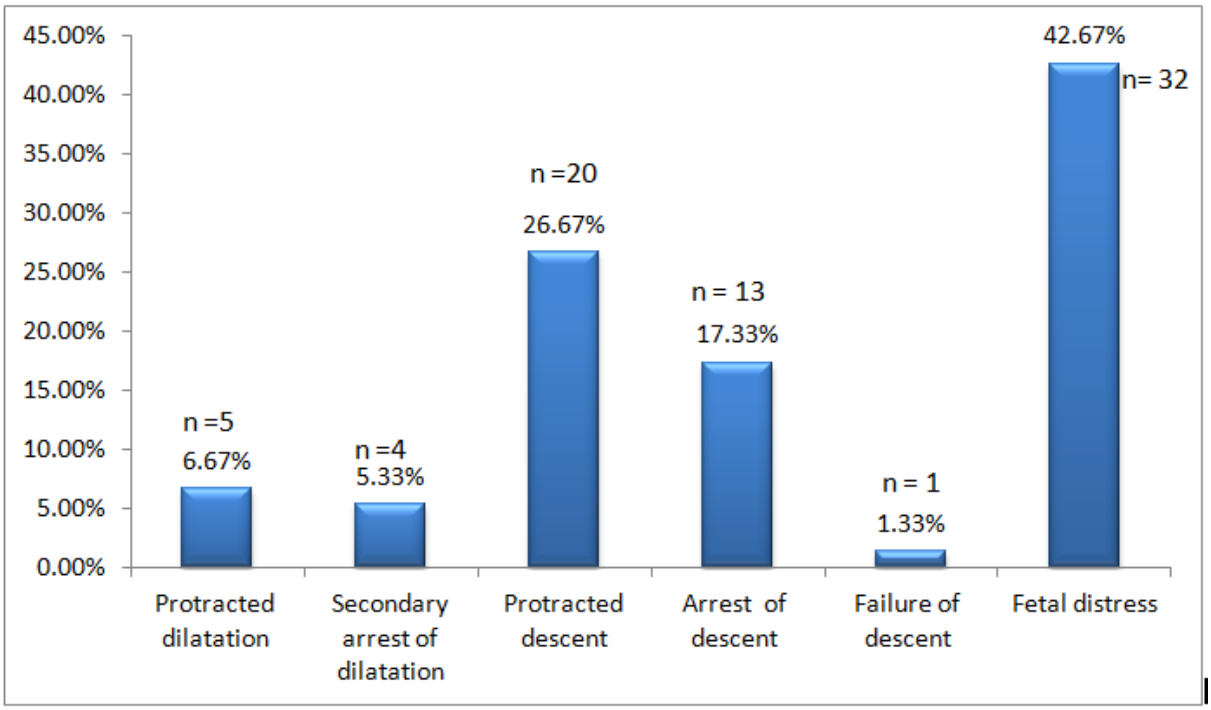


Table 11: Outcome of labour in relation to partograph pattern

Mode of delivery		Groups			Total (n =351)	P value
		I	II	III		
	Vaginal delivery	276 (95.50%)	1 (3.33%)	0 (0.00%)	277 (78.92%)	<.0001
	Outlet forceps delivery	2 (0.69%)	15 (50%)	3 (9.38%)	20 (5.7%)	
	Ventouse delivery	6 (2.08%)	11 (36.67%)	2 (6.25%)	19 (5.4%)	
	LSCS	5 (1.73%)	3 (10%)	27 (84.38%)	35 (9.97%)	
Total		289 (100%)	30 (100%)	32 (100%)	351	

P value < .0001; X^2 = 431.3

In group I there were 276(95.5%) women delivered vaginally. Forceps was used in 2(0.69%) and ventouse was applied in 6(2.08%) cases. Caesarean delivery was done in 5(1.73%). In group II there was 1(3.33%) women delivered vaginally .15 (50%) women had outlet forceps, 11(36.67%) ventouse and 3(10%) underwent caesarean delivery. In group III, 3(9.38%) women had outlet forceps delivery, 2(6.25% had ventouse and 27(84.38%) underwent caesarean delivery.

CHART 8: OUTCOME OF LABOUR DISTRIBUTION

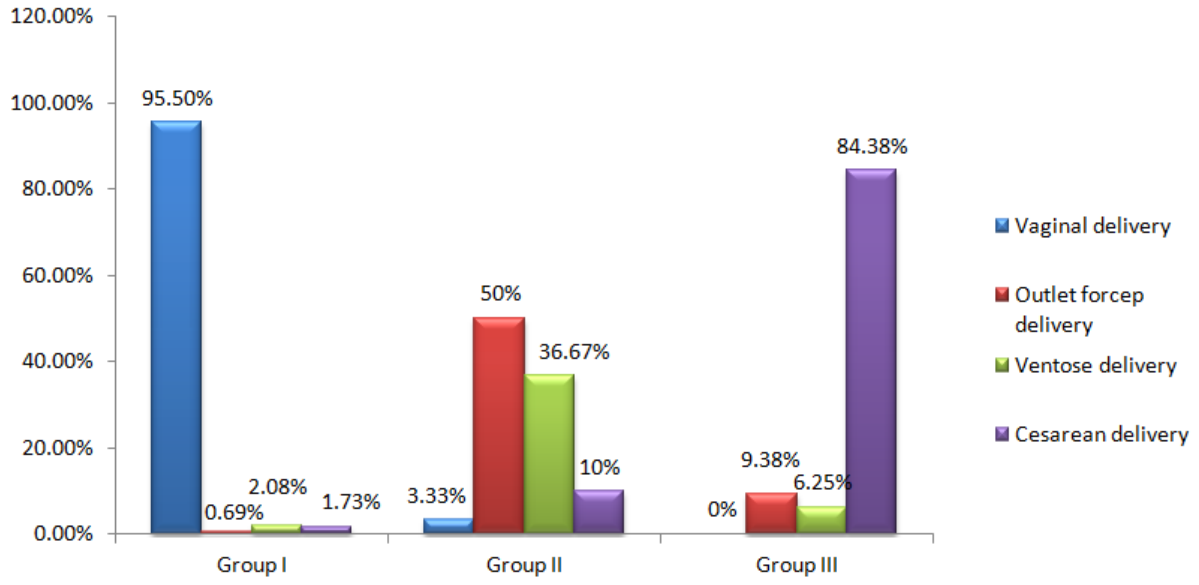


Table 12: Duration of labour in different groups of partograph

Phase of labour	Group I (n = 289)	Group II (n = 30)	Group III (n= 32)
Active phase (hours)	4.72 (+/-)1.33 hours	4.86 (+/-)1.8 hours	5.88 (+/-)1.5 hours
Second stage(min)	23.28 (+/-) 11.22 min	31.93 (+/-) 9.79 min	30.33 (+/-)9.42 min

Active phase of labour lasted longer i.e 5.88(+/-) 1.5 hours in group III, 4.86(+/-) 1.8 hours in group II and 4.72(+/-) 1.33 hours in group I. Second stage of labour lasted 23.28(+/-) 11.22 min in group I, 31.93(+/-) 9.79 min in group II and 30.33(+/-) 9.42 min in group III.

The mean duration of active phase of labour was more in abnormal labour (group II and group III). It was (5.47 hours) in abnormal labour compared to (4.8 hours) in normal labour. Labour was completed within 12 hours in all parturients. The mean duration was statistically significant between the normal (23.06+/-11.11 min) and abnormal (32.38+/-9.65 min) in 2nd stage of labour.

Table 13: Rate of cervical dilatation in different partograph groups

GROUPS (n = 351)	CERVICAL DILATATION RATE (cm/hr)
GROUP I (n= 289)	1.4
GROUP II (n = 30)	0.8
GROUP III (n = 32)	0.6

CHART 9: RATE OF CERVICAL DILATATION DISTRIBUTION

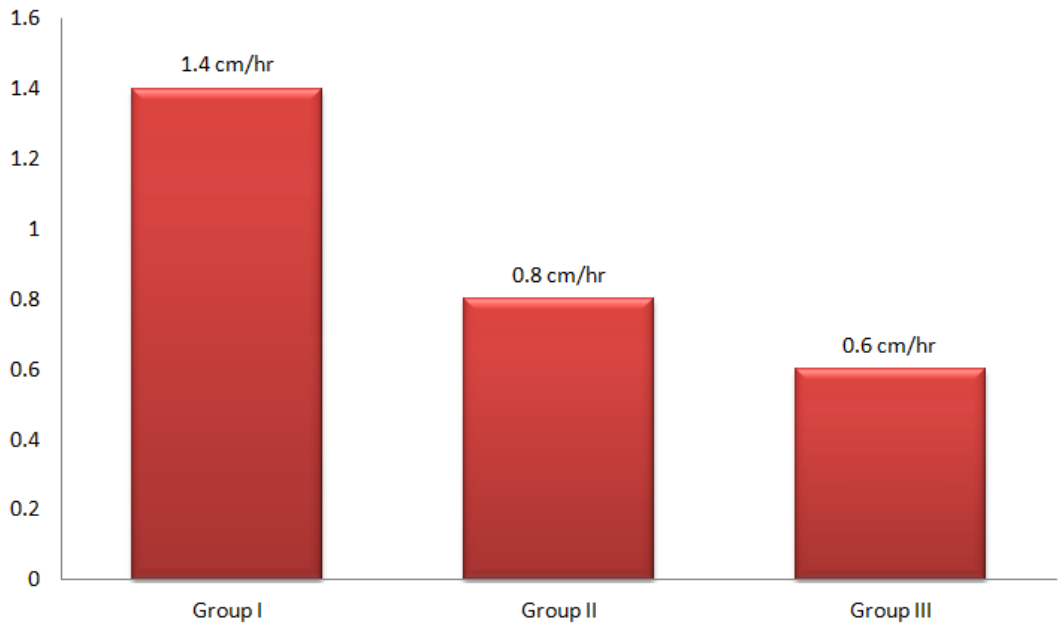


Table 14: Augmentation of labour in relation to partograph pattern

Augmentation		Groups			Total	P value
		Group I	Group II	Group III		
	Yes	51(17.64%)	23(76.66%)	9(28.13%)	83(23.6%)	<.0001
	No	238(82.35%)	7(23.33%)	23(71.88%)	268(76.35%)	
Total		289(100%)	30(100%)	32(100%)	351(100%)	

In group I there were 51(17.64%) women who required oxytocin augmentation. In group II 23 (76.66%) and 9(28.13%) women in group III required augmentation with oxytocin.

CHART 10: AUGMENTATION GROUP WISE DISTRIBUTION

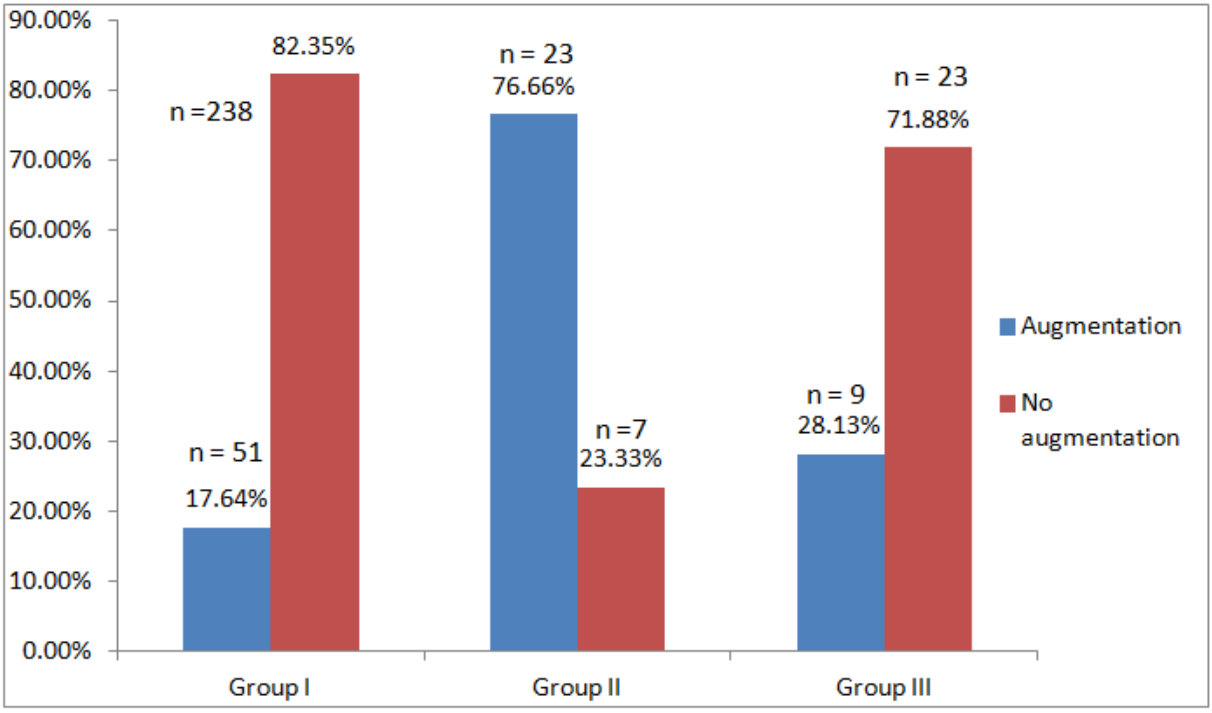


Table 15: Abnormal labour pattern in different partograph groups

Abnormal labour pattern	Partograph			Total (n=75)
	GroupI (n=289)	Group II (n=30)	Group III (n=32)	
Protracted dilatation	0	1(3.33%)	4(12.5%)	5(6.67%)
Secondary arrest of dilatation	0	0	4(12.5%)	4(5.33%)
Protracted descent	0	17(56.67%)	3(9.38%)	20(26.67%)
Arrest of decent	0	8(26.67%)	5(15.63%)	13(17.33%)
Failure of descent	0	1(3.33%)	0	1(1.33%)
Fetal distress	13(100%)	3(10%)	16(50%)	32(42.67%)
Total	13	30	32	75

P value < .0001, X^2 = 48.7

It shows group wise distribution of cases according to various abnormal labour patterns. In group I no abnormal labor pattern was noted. 13 (100%) cases were taken for caesarean delivery due to fetal distress. In group II, 30 cases had abnormal labor pattern. There was 1 (3.33%) with protracted dilation, 17 (56.67%) with protracted descent, 8 (26.67%) arrest of descent, 1 (3.33%) failure of descent. It had 3(10%) women had fetal distress in group II. While in group III out of 32 cases, 4 (12.5%) had protracted dilatation, 4 (12.5%) had secondary arrest of dilatation, l.3 (9.38%) with protracted descent, 5 (15.63%) with arrest of descent. 16 (50 %) cases had fetal distress.

Table 16: **Distribution of mode of delivery in relation to various abnormal labour patterns**.

Abnormal Labour pattern	Mode of delivery				Total
	Vaginal delivery	Outlet forcep delivery	Ventouse delivery	Caesarean delivery	
Protracted dilatation	0(0%)	0(0%)	0(0%)	5(14.2%)	5(6.67%)
Secondary arrest of dilatation	0(0%)	0(0%)	0(0%)	4(11.43%)	4(5.33%)
Protracted descent	1	10(50%)	9(47.37%)	0(0%)	20(26.67%)
Arrest of decent	0(0%)	6(30%)	3(15.79%)	4(11.43%)	13(17.33%)
Failure of descent	0(0%)	1(5%)	0(0%)	0(0%)	1(1.33%)
Fetal distress	0(0%)	3(15%)	7(36.84%)	22(62.86%)	32(42.67%)
Total	1	20	19	35	75

P value < .0002, X^2 = 41.78

One women with protracted decent delivered vaginally after syntocin augmentation. There were 20 women who underwent outlet forceps delivery in whom protracted descent 10(50%) was the most common indication followed by arrest of descent 6(30%), fetal distress3(15%) and failure of decent 1(5%). Total number of women who had vaccum delivery were 19 among which 9(47.37%) also had protracted descent as the most frequent indications followed by fetal distress 7(36.84%) and arrest of decent3(15.79%). Caesarean delivery was done in 22(62.86%) women for fetal distress. Protracted dilatation 5(14.2%), secondary arrest of dilatation 4(11.43%), arrest of dilatation 4 (11.43%) were other indication for caesarean delivery.

Table 17: Neonatal complications in relation to different partograph groups.

Neonatal morbidity	Group I (n= 289)	Group II (n= 30)	Group III (n= 32)	Total (n=351)
Birth asphyxia	2((0.6%))	6(20%)	7(21.8%)	15
Respiratory distress syndrome	0	0	0	0
Neonatal sepsis	4(1.3%)	4(13.33%	2(6.25%)	10
Neonatal hyperbilirubinemia	2(0.6%)	5(16.66%)	1(3.12%)	8
Birth injuries	0	2(6.6%)	0	2
Meconium aspiration syndrome	0	0	2(6.25%)	2
Hypoxic ischemic encephalopathy	4(1.3%)	0	1(3.12%)	5
Total	12(4.15%)	17(56.66%)	13(40.62%)	42(11.96%)

P value < .001

In the present study, out of 351 cases studied, 42(11.9%) of babies had neonatal complications. In group I there were 2(0.6%) case of birth asphyxia, 4 (1.3%) cases of neonatal sepsis, and 4 (1.3%) hypoxic ischemic encephalopathy. In group II there were 6(20%) neonates with birth asphyxia, 4 (13.33%) with neonatal sepsis 5(16.66%) with neonatal hyperbilirubinemia, 2(6.25%) with birth injuries due to instrumental delivery. Whereas in group III 7 (21.8%) suffered birth asphyxia, 2 (6.25%) neonatal sepsis, 1(3.12%) neonatal hyperbilirubinemia, 2 (6.25%) with meconium aspiration, 1(3.12%) with hypoxic ischemic encephalopathy.

CHART 11: NEONATAL COMPLICATION DISTRIBUTION

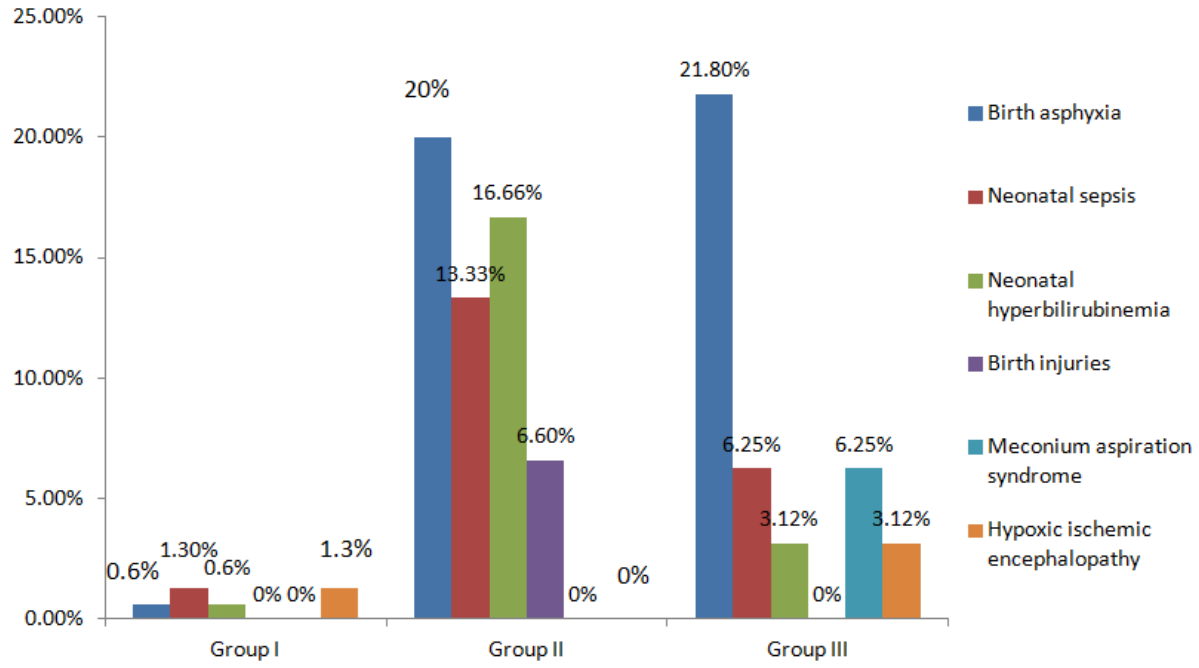


Table 18: Comparison of NICU admission among groups

NICU	GROUPS			TOTAL	P VALUE
	I (n = 289)	II (n = 30)	III (n =32)		
NO	283(97.9%)	20(66.66%)	20(62.50%)	323(92.02%)	<.0001
YES	6(2.07%)	10(33.33%)	12(37.50%)	28(7.98%)	
TOTAL	289(100%)	30(100%)	32(100%)	351(100%)	

NICU care was required in 6 (2.10%) neonates of group I, 10 (30.30%) of the neonates in the group II and 12(37.5%) in group III. The babies who cried after resuscitation were in NICU for few hours for observation and the babies who required NICU care were shifted to mother's side within 4 days after recovery. P value (<.0001) is statistically significant difference.

CHART 12: NICU ADMISSION DISTRIBUTION

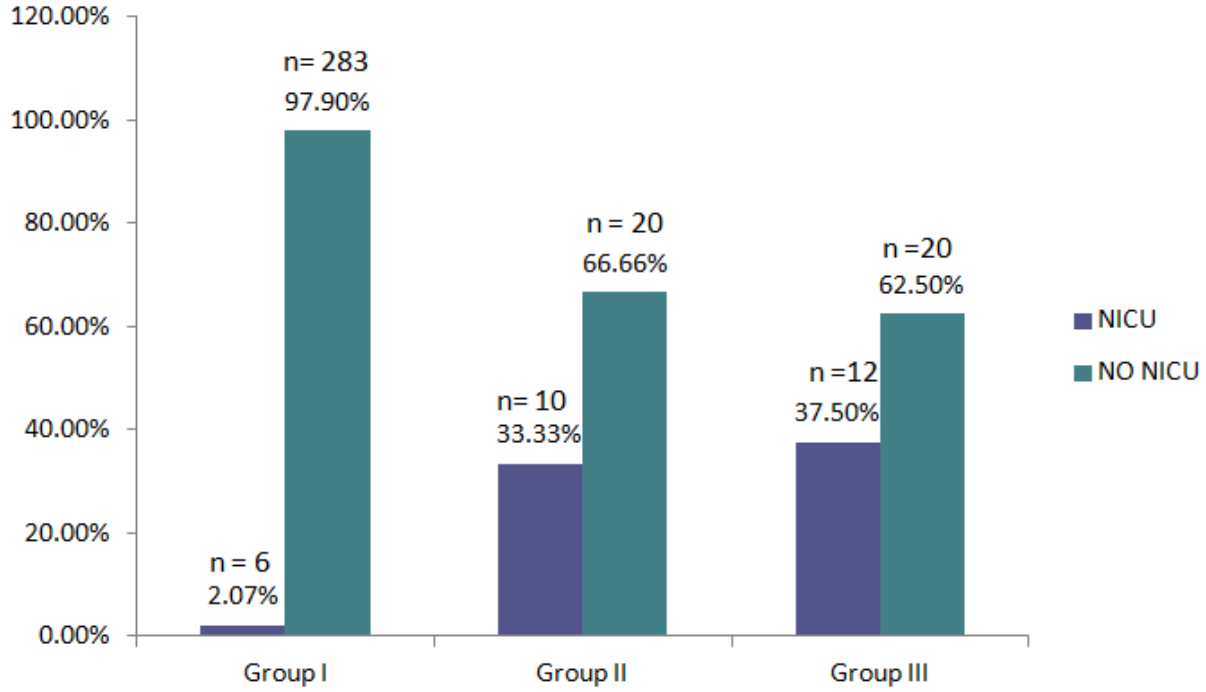


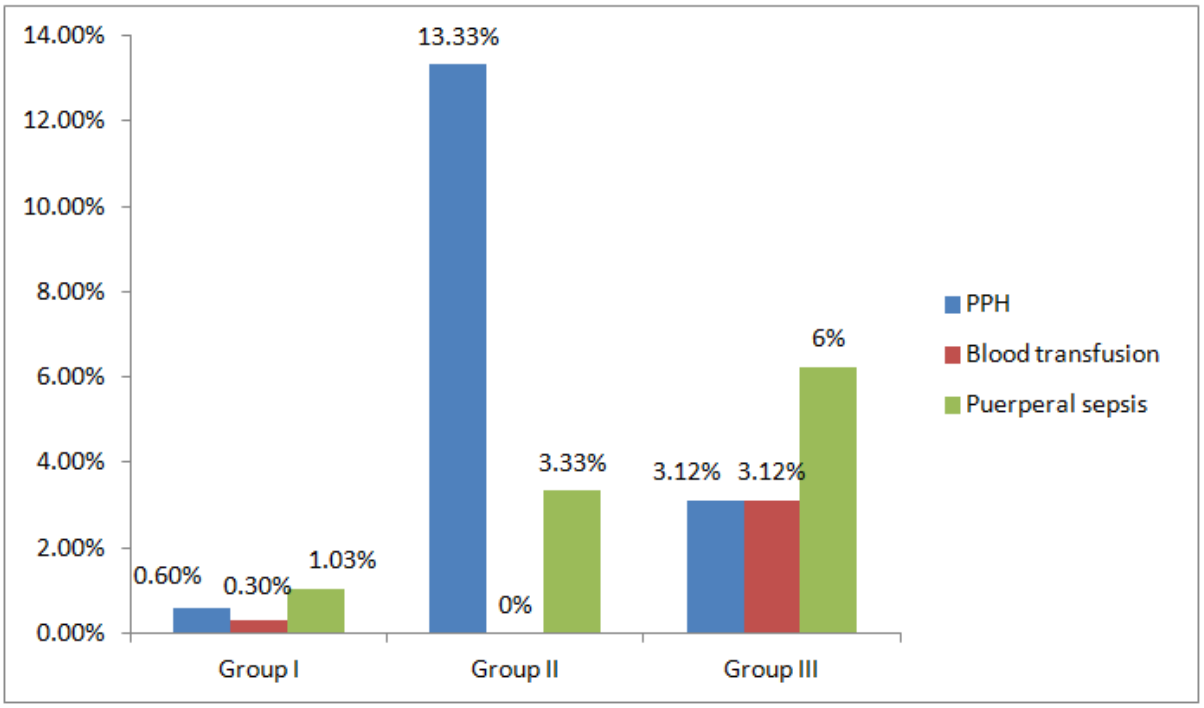
Table 19: Maternal complications in relation to partograph pattern

Maternal complications	Group I (n=289)	Group II (n= 30)	Group III (n= 32)	Total (n= 351)
Postpartum hemorrage	2(0.6%)	4(13.33%)	1(3.12%)	7
Need for blood transfusion	1(0.3%)	0	1(3.12%)	2
Puerperal pyrexia	3(1.03%)	1(3.33%)	2(6.25%)	6
Wound complication	-	-	-	-
Total	6 (2.07%)	5(16.66%)	4(12.5%)	15(4.27%)
Average hospital stay(days)	4	7	7	

P value <.0001; X^2 = 37.21

There were 6 (2.07%) women in group I who had maternal complications. There was 2(0.6%) cases with PPH, 1(0.3%) women needing blood transfusion, 3(1.03%) with puerperal pyrexia. In group II 4(13.33%) women had PPH, 1 (3.33%) had puerperal pyrexia. While in group III out of 4 (12.5%), there was 1(3.12%) case with PPH, 1 (3.12%) with requirement of blood, 2(6.25%) cases with puerperal pyrexia. The average hospital stay was 4 days in group I and 7 days in group II and group III.

CHART 13: MATERNAL COMPLICATION DISTRIBUTION



Discussion

DISCUSSION

Labour is the last phase of pregnancy in which prudent decision can improve the outcome after months of anticipation and careful antepartum care. It is imperative that the clinicians are up to date on recent development of intraparum management. Although labour is natural physiological phenomenon and most women have the pleasing, rewarding experience of a safe vaginal birth of a healthy baby, still a minority continue to face the complications of prolonged labour and its consequences.

WHO-modified partograph is employed as a necessary tool in the active labour management method. The partograph is an effective utility in timely identification and management of any anomaly from normal labour. The utility of partograph for labour management clearly distinguishes normal and abnormal progression of labour and identifies women who are likely to necessitate interventions. Moreover, the utility of partograph is decisive in timely transfer of patient with abnormal labour progression; therefore, it is applicable in peripheries.

This study was conducted on 351 women undergoing labour within the inclusion criteria. The results were analysed with the implementation of the WHO-modified partograph. The useful application of the method in identifying dystocia were measured and it reflected on the maternal and neonatal outcomes

AGE AND PARITY

In this study, primigravida were more in age group of 21 -25 years. Multigravida mostly were 25years and above. Age or parity had no effect or length of stage of labour as studied by Irvine et al (1930) where they studied 1250 consecutive labours in the University of Virginia Hospital looking at both primiparous and multiparous women.

LABOUR PATTERN

The current study showed 75(21.37%) women out of 351 women had labour abnormalities. 276(78.63%) of women progressed normally.

OUTCOME OF LABOUR

In the current study, of total 351 study parturients majority 277 (78.92%) delivered vaginally followed by caesarean 35 (9.97%), 20 (5.70%) were forceps assisted delivery, while 19 (5.41%) needed vacuum delivery.

TABLE 20: COMPARISION OF STUDIES IN REGARD TO LABOUR OUTCOME.

Outcome of labour	Penumadu KM et al. 2018	Lakshmidevi Muralidhar et al 2012	Renu Meena et al 2016
FTND	72.4%	82%	81%
Forceps	2.4%	7%	11%
Vacuum	1.6%		
LSCS	23.6%	11%	8%

Outcome of labour	Bhatt MJ et al.2018	Kunaal Shinde et al 2012	Pranav Sood et al
FTND	82.5%	84%	73.1%
Forceps	9%	6%	9.5%
Vacuum			
LSCS	8.5%	10%	17.4%

Outcome of labour	Philpott and Castle series	WHO	Present Study
FTND	78.85%	78.3%	78.92%
Forceps	15.55%	4.2%	5.7%
Vacuum		10.5%	5.41%
LSCS	2.6%	6.9%	9.97%

In the Phipott and Castle series study, 78.85% had FTND, 15.55% had outlet forceps or vaccum delivery and 2.6% had LSCS .[61]

In Daftary and Mhatre series, 68% had FTND, while 14% required outlet forceps / vacuum and 7.5% underwent LSCS .[57]

In the WHO study 78.3% had FTND, while 4.2% required outlet forceps, 10.5% had vacuum application and 6.9% underwent LSCS .[59]

In Impey, L. et al., study 75.4% had FTND while 19.2% required outlet forceps / vacuum and 5.4% underwent LSCS. [60]

The present study showed results similar with studies done by was Philpott and Castle series, Bhatt MJ et al., (2018), WHO, Lakshmidevi Muralidhar et al., (2012) and Renu Meena et al., (2016) .[61, 19, 35, 70]

PARTOGRAPH GROUPS

In the current study out of 351 total women, 289 (82.34%) women delivered when partograph was within alert line (Group I).In Group II i.e between alert and action line 30 (8.55%) patients delivered and 32 (9.12%) delivered in Group III after action line.

In study done by Shinde et al in 2012 majority of them delivered normally (78%) without any operative intervention. [33] Twelve percent women delivered after crossing the alert line but before reaching the action line. Only seven percent women crossed action line.

Philpott and Castle (1972) in his prospective study, observed that 92.30% cases who delivered before alert line, had spontaneous vaginal delivery and 6.1% had caesarean section. [61]

Ventouse was applied in 1.5%. Among those who crossed the alert line, 61.90% had normal vaginal delivery and 33.3% had caesarean section and ventouse was applied in4.7%. Seventy eight percent of women, who crossed four hourly action line, required some or the other kind of surgical intervention. After action line, 21.40% had normal vaginal delivery, 71.4% had caesarean section and ventouse was applied in 7.1%.

Philpott and Castle series (1972 B) showed that 89.8% of women who delivered before reaching the alert line, had spontaneous vaginal delivery[11]. Ten percent were delivered by vacuum extraction, 0.40% cases had caesarean section. In the same study, cases crossing the alert line and delivering before action line, it was observed that 79.4% had normal vaginal delivery, 20.5% had ventouse extraction and no case required caesarean section. They showed that 72.1% of cases crossing the four hourly action line required some interference (caesarean section rate 20.6% and vacuum extraction 51.6%.

Drouin *et al* (1979) showed that only 1.3% of women delivered within the alert line required medical or operative interventions, while 26.7% of the women, delivered after crossing only the alert line and 72% of the women, delivered after action line had to be intervened before delivery. [62]

Shortri A.N. *et al* (1991) in her study observed that 79.9% primigravidae delivered normal vaginally, 5.7% required caesarean section before alert line was crossed. The incidence of

caesarean section was 26.7% in those cases whose alert line was crossed [64]. This study results were in accordance with Shinde et al., (2012) .[33]

ABNORMAL LABOUR PATTERN AND LABOUR ABNORMALITY IN PARTOGRAPH GROUPS

This study showed 75 (21.37%) women out of 351 women had labour abnormalities.276 (78.63%) of women progressed normally. Of this study of 75 the various abnormal labour patterns observed were: protracted descent 20 (26.67%), protracted dilatation 5 (6.67%), arrest of descent 13 (17.33%) secondary arrest of dilatation 4 (5.33%) and failure of descent 1(1.33%). 32(42.67%) babies had fetal distress. Protracted descent was the most common abnormality.

In group wise distribution of cases according to various abnormal labour patterns. In group I, 13 (100%) cases were taken for caesarean delivery due to fetal distress. In group II, 30 cases had abnormal labor pattern. There was 1 (3.33%) with protracted dilation, 17(56.67%) with protracted descent, 8 (26.67%) arrest of descent, 1 (3.33%) failure of descent. It had 3(10%) women had fetal distress in group II. While in group III out of 32 cases, 4 (12.5%) had protracted dilatation, 4 (12.5%) had secondary arrest of dilatation, l.3 (9.38%) with protracted descent, 5 (15.63%) with arrest of descent. 16 (50 %) cases had fetal distress.

In study done by Shinde et al. (2012) abnormal labour pattern was observed in 15 % of cases [33]. Arrest of descent (46.66 %), protracted descent (26.66 %) and failure of descent (20%) were the commonest abnormalities noted. Out of 15 cases, who had abnormal labour pattern, 10 had undergone caesarean section, 4 were delivered by instrumental delivery and one had normal vaginal delivery.

In the present study although Groups I, fetal distress was the main indication for caesarean delivery. In group II and Group III along with fetal distress, secondary arrest of descent, and secondary arrest of dilatation were also facilitated by instrumental and caesarean delivery. Caesarean section was used in 35 cases and instrumental delivery was used for 40 cases out of the total cases with abnormal pattern.

MODE OF DELIVERY IN DIFFERENT PARTOGRAPH GROUPS

In the current study (78.92%) delivered vaginally without any operative intervention. In 11.1 percent cases the delivery occurred after the alert line was crossed prior to reaching the action line. Only 9.12 percent women crossed action line (group 3). Caesarean delivery cases were 35 (9.97%), 20 (5.70%) forceps assisted delivery, while 19 (5.41%) n vacuum delivery. The caesarean section rates for group 1, 2 and 3 were 1.73%, 10% and 84.38% respectively. Caesarean section was required, mostly in cases of fetal distress and fetal descent abnormalities. It was clearly seen that the necessity for operative intervention i.e. caesarean section increased after the alert or action line were crossed.

The graphic form introduced by Philpott and Castle (1972) observed that 92.30% cases who delivered before alert line, had spontaneous vaginal delivery and 6.1% had caesarean section [10]. Ventouse was applied in 1.5%. Among those who crossed the alert line, 61.90% had normal vaginal delivery and 33.3% had caesarean section and ventouse was applied in 4.7%. Seventy eight percent of women, who crossed four hourly action line, required some or the other kind of surgical intervention. After action line, 21.40% had normal vaginal delivery, 71.4% had caesarean section and ventouse was applied in 7.1%.

Philpott and Castle series (1972 B) showed that 89.8% of women who delivered before reaching the alert line, had spontaneous vaginal delivery [11]. Ten percent were delivered by vacuum extraction, 0.40% cases had caesarean section. In the same study, cases crossing the

alert line and delivering before action line, it was observed that 79.4% had normal vaginal delivery, 20.5% had ventouse extraction and no case required caesarean section. They showed that 72.1% of cases crossing the four hourly action line required some interference (caesarean section rate 20.6% and vacuum extraction 51.6% .[61.]

Drouin et al., (1979) showed that medical or operative interventions was required before delivery in 1.3% of deliveries within the alert line, 26.7% of deliveries crossing the alert line and 72% of deliveries after crossing action line. [62]

Vaidya P.R et al., (1985) showed that 99% of the cases delivering prior to crossing the alert line had normal vaginal delivery and only 1 % of them required forceps application [63]. Of the cases crossing alert line, 70% had normal vaginal delivery, 26% required forceps application and 4 % required vacuum extraction. 88% of cases with the labour curves crossing the four hourly action line required interference. Forceps application and vacuum extraction were done in 52% cases and caesarean sections were done in 36% cases.

Shortri A.N. *et al* (1991) in her study observed that 79.9% primigravidae delivered normal vaginally, 5.7% required caesarean section before alert line was crossed. The occurrence of caesarean section took place in 26.7% cases whose alert line was crossed [64].

According to study done by Gifford et al., the absence of labour progression was an indicator for LSCS in 53 % of the women .[72]. Daftray and Mhatre also had comparable rates of LSCS in their study. [57]

In current study, the observations were comparable to older studies done by Impey et al., (2000) and Javed et al., (2002) in which the proportion of deliveries with aid of instruments and caesarean process was higher[71,45].

DURATION OF LABOUR IN ACTIVE AND SECOND STAGE OF LABOUR

During this study we observed that, the period of active labour phase was 4.7 hour and 5.3 hours whereas, the following labour phase was 25minutes and 30minutes in cases with normal and abnormal labour patterns respectively. The mean period of active phase was 5.25 hours and 4.6 hours in primigravidas and multigravidas respectively. The mean duration of the second stage in the present study in cases of abnormal pattern is 33 min.

In a study done by Zhang et al., (2003), the mean duration of the second stage of labour was 53 min .[73] Many authors have reported more protracted cervical dilatational abnormalities as more common than descent abnormalities.

In study by Shinde et al.,(2012) the duration of active phase of labour was 4.02 hours and 7.16 hours in cases with normal and abnormal labour patterns respectively .[33] The duration of second stage of labour was 42 minutes and 92 minutes in cases with normal and abnormal labour patterns respectively. The average duration of active phase of labour was 5.39 hours and 3.7 hours in primigravidas and multigravidas respectively.

WHO multicenter trial in Southeast Asia (WHO, 1994), reported that introduction of the partograph significantly reduced extended labour (6.4% to 3.4%; p= 0.002) .[66]

Gupta et al., (1987) and Iffat Javed *et al.* (2007) had also reported the effectiveness and utility of partograph in reducing prolonged labour. [67]

CERVICAL DILATATION

In primigravidae the mean cervical dilatation rate reported by Shinde et al., (2012) was 1.7cm/hr whereas, for active phase it was observed as 1.3 cm/hr. [33]

In 1969 Hendricks et al. demonstrated that in the active phase of normal labour the rate of dilatation of the cervix in primigravidas and multigravidas varies little and that there is no deceleration phase at the end of the first stage of labour. [74]

In current study, the mean cervical rate dilatation was 1.4 cm per hour. The rate was slower in women with abnormal labour pattern

AUGMENTATION

According to studies done by Lennox et al., (1998); Pettersson et al., (2000); Fahdhy and Chongsuvivatwong, (2005) using modified WHO partograph ,its use helps in early decision regarding augmentation or termination of labour or patient transfer to a better-equipped facility and has proven effective as an early warning tool. [65, 41, 18]

In this study the labour was augmented more in group II in comparison with groups I and III. Nine patient (28.13%) in group III required augmentation due to inadequate uterine contractions but due to fetal distress underwent instrumental or caesarean delivery.

ABNORMAL LABOUR PATTERN AND MODE OF DELIVERY

About 21.37 % of cases in this study were observed with abnormal labour pattern. The abnormalities observed were 17.33%, 26.67% in arrest of descent, protracted descent respectively whereas, in 6.67% cases the abnormalities were linked to protracted dilatation and 5.33%. It was observed that 42.67% of women had fetal distress.

In study done by Shinde et al., (2012) abnormal labour pattern was observed in 15 % of cases. [33] Arrest of descent (46.66 %), protracted descent (26.66 %) and failure of descent (20%) were the commonest abnormalities found.

In a study carried out by Friedman the arrest of descent was reported in 5-6% cases. In his study 30.4% required caesarean section, 37.6% required mid forceps, 12.7% had forceps rotation and 5.1 % cases had failed forceps. Timely surgical interferences resulted in better outcome for mother and fetus. [51]

MATERNAL COMPLICATIONS

Dangal (2007) reported that use of partograph was associated with a significant reduction in severe labour complications i.e. postpartum hemorrhage, uterine rupture, sepsis etc. [44]

Javed. I, et al. (2007) and Fahdhy et al. (2005) reported that labour monitored with partograph significantly reduced the number of vaginal examinations ($p < 0.001$) .[45, 41]

In study done by Shinde et al., (2012) maternal morbidity was 3.52 % in cases having normal labour pattern whereas, it was 53.33 % in cases with abnormal labour pattern. [33] Morbidity was mainly related to infection, blood loss and wound sepsis. The average hospital stay was 3.5 days and 8.0 days in women with normal and abnormal labour patterns respectively.

In the present study, the maternal morbidity was 4.27%. The rate of occurrence of maternal complication significantly differed between the three groups.It was more in group II (16.66%) and III (12.5%) than in group I (2.07%). The complication of PPH was more in group II 13.33% and least in group I (0.6%). The need for blood transfusion was more in group III (3.12%).Puerperal purexia was maximum in group III (6.25). The mean stay at hospital was 4 days and 7days in women with normal and abnormal labour patterns respectively.

The results of this study are in accordance with study done by Shinde et al., (2012) .[33] It may be conjectured that timely identification of dystocia and immediate intervention ultimately prevented maternal complications as a result of prolonged labour and thereafter.

TABLE 21: Perinatal outcome

Neonatal complications	R.B. Behere et al	Present study
Birth Asphyxia	6%	6.3%
Neonatal jaundice	5.5%	2.3%
Neonatal infection	2%	2.8%

From the above table, it is observed that in the present study 88.03% had no complications compared to 86.5% by RB Behere. Birth Asphyxia was found in 3.57% of babies compared to 6% by Behere while neonatal jaundice was 2.3% compared to 5.5% by Behere. Neonatal infections was 2.8% in present study compared to 2% by R.B. Behere. [75]

The neonatal morbidity was seen in 11.9% of babies. In the present study, out of 351 cases studied, 42 (11.9%) of babies had neonatal complications. In group I there were 2 (0.6%) case of birth asphyxia, 4 (1.3%) cases of neonatal sepsis, and 4 (1.3%) hypoxic ischemic encephalopathy. In group II there were 6 (20%) neonates with birth asphyxia, 4 (13.33%) with neonatal sepsis 5 (16.66%) with neonatal hyperbilirubinemia, 2 (6.25%) with birth injuries due to instrumental delivery. Whereas in group III 7 (21.8%) suffered birth asphyxia, 2 (6.25%) neonatal sepsis, 1 (3.12%) neonatal hyperbilirubinemia, 2 (6.25%) with meconium aspiration, 1 (3.12%) with hypoxic ischemic encephalopathy. NICU care was required in 6 (2.10%) neonates of group I, 10 (30.30%) of the neonates in the group II and 12 (37.5%) in group III. The babies who cried after resuscitation were in NICU for few hours for observation and the babies who required NICU care were shifted to mother's side within 4 days after recovery. P value (<.0001) is statistically significant difference

In Shinde et al., (2012) study the neonatal morbidity was seen in 14 % of babies. [33] Birth asphyxia was observed in 6 % babies. The incidence was more in women with abnormal course of labour than with normal course of labour. Women with normal labour course had mild form of asphyxia as compared to women with abnormal course. Babies of women with second stage or descent abnormalities had more likelihood of asphyxia. Neonatal sepsis and meconium aspiration were seen in three newborns each.

Fahdhy et al. (2005) and Lavender et al. (2008) reported that post partograph application at 1 minute there was a significant improvement in Apgar score. The present study clearly co relates with these observations [41, 68].

Orji et al. (2007) conjectured that the utility of partograph clearly improved the Apgar score substantially both at 1 and 5 minute. [38] While WHO multicentre trails does not demonstrate any improvement in neonatal outcome. They reported that the utility of partograph markedly resulted in reduction of prenatal mortality rate (p=0.004), two maternal deaths occurred prior to application of partograph while none after partograph introduction.

WHO Maternal Health and Safe Motherhood Programme also reported that intrapartum stillbirths reduced from 0.5% to 0.3% after partograph use.

Orji *et al.* (2007) observed that the utility of partograph was effective in reducing neonatal asphyxia significantly .[38] Cahill *et al.*, (1992) observed that neonatal asphyxial seizures were increased from 1.3/1000 to 2.3/1000 when labour augmented with oxytocin. [69].

The observation in all the above series illustrate that the surgical operative interference is more as the labour curve moves across towards the right. Furthermore, as the labour curve moves across the action line there is a considerable increase in surgical interference. Our results correlates with the studies by Lakshmidevi et al., Renu Meena et al., Bhatt, M. et al.,

Daftary and Mhetra series and WHO. [35, 70, 19, 57, 66] Hence, the intervention markedly reduced the occurrence of extended labour and associated complications. Moreover, the requirement of NICU to deal with maternal and fetal complications significantly reduced with timely interventions.

Thus, the WHO-modified partograph is a vital tool for the management of labour in minimizing mean morbidity and mortality of the mother and newborns.

Summary

SUMMARY

This study was a prospective observation study using WHO modified partograph on 351 parturient women who met inclusion criteria done at RLJH Hospital, Kolar.

All the patients with term gestation without any medical or obstetrical complication were taken in this study.

- In the present study, the mean age of the patients was 23.81years with a standard deviation of (+/-) 3.5 years.
- Primigravida comprised of 61.25% and multigravida 38.75% of parturients.
- In the present study out of total 215 primigravid cases 177 cases went into spontaneous and 38 were induced. In multigravida comprising of 136 cases 108 went into spontaneous and 28 cases were induced.
- Out of 351 total cases studied, the different partograph groups included group I 289 (82.34%), group II 30 (8.55%) and group III 32 (9.12%) cases.
- Out 351 women studied 75 (21.37%) cases had abnormal labor pattern.
- Out of 351 study parturients delivered vaginally were 277(78.92%), 35(9.97%) caesarean section, and 20 (5.7%) forceps assisted delivery and 19 (5.41%) vacuum delivery.
- In this study of 75 cases had abnormal labour, the various abnormal labour patterns observed were: protracted descent 20 (26.67%), protracted dilatation 5 (6.67%), arrest of descent 13 (17.33%) secondary arrest of dilatation 4 (5.33%) and failure of descent 1 (1.33%). Moreover, 32 (42.67%) babies had fetal distress on intrapartum electronic fetal monitoring. Protracted descent was the most common abnormality.

- In group I the outcome of labour was 276 (95.5%) women delivered vaginally. Forceps was used in 2 (0.69%) and ventouse was applied in 6 (2.08%) cases. Caesarean delivery was done in 5 (1.73%). In group II there was 1 (3.33%) women who delivered vaginally. 15 (50%) women had outlet forceps, 11 (36.67%) ventouse and 3(10%) underwent caesarean delivery. In group III, 3 (9.38%) women had outlet forceps delivery, 2 (6.25%) had ventouse and 27(84.38%) underwent caesarean delivery
- Active phase of labour lasted longer i.e 5.88(+/-) 1.5 hours in group III, 4.86(+/-) 1.8 hours in group II and 4.72(+/-) 1.33 hours in group I. Second stage of labour lasted 23.28(+/-) 11.22 min in group I, 31.93(+/-) 9.79 min in group II and 30.33(+/-) 9.42 min in group III.
- The mean duration of active phase of labour was more (5.47 hours) in abnormal labour (group II and group III). The mean duration was statistically significant between the normal (23.06+/-11.11 min) and abnormal (32.38+/-9.65 min) in 2nd stage of labour.
- The rate of cervical dilation was 1.4 cm/hr in group I .0.8 cm/hr in groupII and 0.6 cm/hr in group III.
- In group I there were 51 (17.64%) women who required oxytocin augmentation. In group II 23 (76.66%) and 9 (28.13%) women in group III required augmentation with oxytocin.
- In group I no abnormal labor pattern was noted. 13 (100%) cases were taken for caesarean delivery due to fetal distress. In group II 30 cases had abnormal labor pattern. There was 1 (3.33%) with protracted dilation, 17 (56.67%) with protracted descent, 8 (26.67%) arrest of descent, 1 (3.33%) failure of descent. It comprised of 3 (10%) women had fetal distress in group II. While in group III out of 32 cases, 4

(12.5%) had protracted dilatation, 4 (12.5%) had secondary arrest of dilatation, 3 (9.38%) with protracted descent, 5 (15.63%) with arrest of descent. 16 (50 %) cases had fetal distress.

- Out of 5 cases of protracted dilatation all were taken for caesarean delivery. In secondary arrest of dilatation also all 4 cases were taken for caesarean delivery. In protracted descent one case delivered vaginally, 10 cases had outlet forceps delivery, 9 cases had vacuum assisted delivery. In cases with arrest of descent 6 had outlet forceps delivery 3 cases had vacuum assisted delivery and 4 cases were taken for caesarean delivery. There was one cases of failure of descent with was delivered by outlet forceps. There were 22 cases with fetal distress in which 3 delivered by outlet forceps 7 by vacuum and 22 were taken for caesarean delivery.
- In the present study, out of 351 cases studied, 42 (11.9%) of babies had neonatal complications. In group I there were 2 (0.6%) case of birth asphyxia, 4 (1.3%) cases of neonatal sepsis, 2 (0.6%) cases neonatal hyperbilirubinemia and 4 (1.3%) hypoxic ischemic encephalopathy. In group II there were 6 (20%) neonates with birth asphyxia, 4 (13.33%) with neonatal sepsis 5 (16.66%) with neonatal hyperbilirubinemia, 2(6.25%) with birth injuries due to instrumental delivery. Whereas in group III 7 (21.8%) suffered birth asphyxia, 2 (6.25%) neonatal sepsis, 1 (3.12%) neonatal hyperbilirubinemia, 2 (6.25%) with meconium aspiration, 1 (3.12%) with hypoxic ischemic encephalopathy.
- NICU care was required in 6 (2.10%) neonates of group I, 10 (30.30%) of the neonates in the group II and 12 (37.5%) in group III. P value (<.0001) was found to have statistically significant difference.
- There were 6 (2.07%) women in group I who had maternal complications. There was 2 (0.6%) cases with PPH, 1 (0.3%) women needing blood transfusion, 3 (1.03%) with

puerperal pyrexia. In group II 4 (13.33%) women had PPH, 1 (3.33%) had puerperal pyrexia. While in group III out of 4 (12.5%), there was 1 (3.12%) case with PPH, 1 (3.12%) with requirement of blood, 2 (6.25%) cases with puerperal pyrexia. The average hospital stay was 4 days in group I and 7 days in group II and group III.

Many of the serious complication of labour were prevented with use of partograph as stated earlier as their consequences were anticipated earlier.

Early detection of abnormal progress of labour and prevention of prolonged labour significantly reduced the risk of complication and their consequences. So, it is suggested that intrapartum monitoring by modified WHO partograph is an important tool in monitoring the progress of labour.

Conclusion

CONCLUSION

The use of modified WHO partograph with continuous pictorial overview of progress of labour with alert and action lines increases the quality and regularity of observations on mother and fetus during labour. It helps in early identification of abnormal progress of labour and initiation of early and effective intervention thereby preventing problems of prolonged labour. Modified WHO partograph is a safe, simple, inexpensive, valuable tool that significantly reduces the maternal and fetal adverse outcome.

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Annexures

ANNEXURES

PATIENT INFORMATION SHEET

Study title: TO STUDY THE ROLE OF MODIFIED WHO PARTOGRAPH AS AN ANALYTIC TOOL FOR PROGRESS OF LABOUR IN TERM PREGNANCY.

Study location: R L Jalappa Hospital and Research Centre attached to Sri Devaraj Urs Medical College, Tamaka, Kolar

Details- In all cases detailed history will be obtained and a thorough general physical and obstetrical examination will be done.

The course of labour will be monitored by using a modified WHO partograph. The cases showing abnormal labour course will be re-evaluated by senior obstetrician. The decision for operative intervention will be taken by senior obstetrician. Individual partograph will be studied to know the various aspects related to course and labour. Maternal outcome will be analysed by studying various parameters like mode of delivery, need for operative intervention ICU admission. The perinatal outcome will be analysed by studying various parameters like condition of baby at birth Apgar score, need for admission in neonatal intensive care unit.

Please read the following information and discuss with your family members. You can ask any question regarding the study. If you agree to participate in the study we will collect information (as per proforma) from you or a person responsible for you or both. Relevant history will be taken. This information collected will be used only for dissertation and publication.

All information collected from you will be kept confidential and will not be disclosed to any outsider. Your identity will not be revealed. This study has been reviewed by the Institutional Ethics Committee and you are free to contact the member of the Institutional Ethics Committee. There is no compulsion to agree to this study. The care you will get will not change if you don't wish to participate. You are required to sign/ provide thumb impression only if you voluntarily agree to participate in this study.

For further information contact

Dr. Shweta Sinha Post graduate

Department of obstetrics and gynaecology, SDUMC , Kolar

CASE PROFORMA

NAME: IP NO:

AGE: DOA:

OCCUPATION: DOD:

ADDRESS:

EDUCATION:

HUSBANDS OCCUPATION:

SOCIOECONOMIC STATUS:

CHIEF COMPLAINTS:

HISTORY OF PRESENT ILLNESS:

OBSTETRIC HISTORY:

Marital life: Consanguinity:

Gravida: Para: living: Abortion: Dead:

Details of previous pregnancy:

Details of present pregnancy:

MENSTRUAL HISTORY:

Last menstrual period: Age of menarche:

Expected delivery date:

Period of gestation:

Period of gestation according to early scan:

Past menstrual cycles:

PAST HISTORY:

HTN/DM/BA/TB/BLOOD DYSCRASIAS/EPILEPSY/THYROID DISORDER/CARDIAC DISEASE/ALLERGY

H/O blood transfusions:

H/O Surgeries or hospitalization:

PERSONAL HISTORY:

Sleep and appetite:

Diet:

Bowel and bladder:

FAMILY HISTORY:

DRUG HISTORY:

GENERAL EXAMINATION:

General condition: Fair/ moderate/ Poor

Built: Nourishment:

Ht: cmsWt: kgs BMI:

Pallor: Icterus:

Cyanosis: Clubbing:

Lymphadenopathy: Edema:

VITALS:

Pulse rate:

Respiratory rate:

Blood pressure

Temperature:

SYSTEMIC EXAMINATION:

Cardiovascular system:

Respiratory system:

Central nervous system:

Per abdomen: Uterus size:

Relaxed / Irritable / Acting

Presentation: cephalic/ Breech/ other

FHS:

LOCAL EXAMINATION:

Per vaginum:Effacement:

Dilatation:

Station:

Membranes:

Pelvis:

PROVISIONAL DIAGNOSIS:

INVESTIGATIONS:

Blood group and Rh typing:

CBC: HB: HIV:

PCV: HbsAG:

RBC: VDRL:

WBC:

PLT:

RBS:

Urine analysis: Albumin-

Sugar-

Microscopy-

OBSTETRICS SCAN:

DELIVERY DETAILS:

Mode of delivery: Vaginal delivery/ Caesarean section

CAESAREAN-

Indication:

DETAILS OF NEONATE:

Sex: Date: Time:

Birth weight:

APGAR : 1'- 5'-

Admission to NICU:

MATERNAL COMPLICATIONS:

Hypertension

Convulsions

Premature rupture of membranes

Antepartum hemorrhage

Postpartum hemorrhage

Uterine hyperstimulation

FETAL COMPLICATIONS:

Respiratory distress

Admission to NICU

CONDITION AT DISCHARGE:

Mother:

Baby:

SRI DEVARAJ URS MEDICAL COLLEGE & RESEARCH CENTRE, TAMAKA, KOLAR

PATIENT CONSENT FORM

Case no:

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I have understood that I have the right to refuse consent or withdraw it at any time during the study and this will not affect my treatment in any way. I consent voluntarily to participate in this study

"TO STUDY THE ROLE OF MODIFIED WHO PARTOGRAPH AS AN ANALYTIC TOOL FOR PROGRESS OF LABOUR IN TERM PREGNANCY."

Name of Participant_____

Signature/ thumb print of Participant _____

Date _____

Statement by the researcher/person taking consent:

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands that the following will be done:

Detailed history will be taken including physical examination and general examination.

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

Name of Researcher/person taking the consent_____

Signature of Researcher /person taking the consent_____

Date _____

Name and Address of Principal Investigator: Dr. Shweta Sinha

R.L Jalappa Hospital

Tamaka, Kolar.

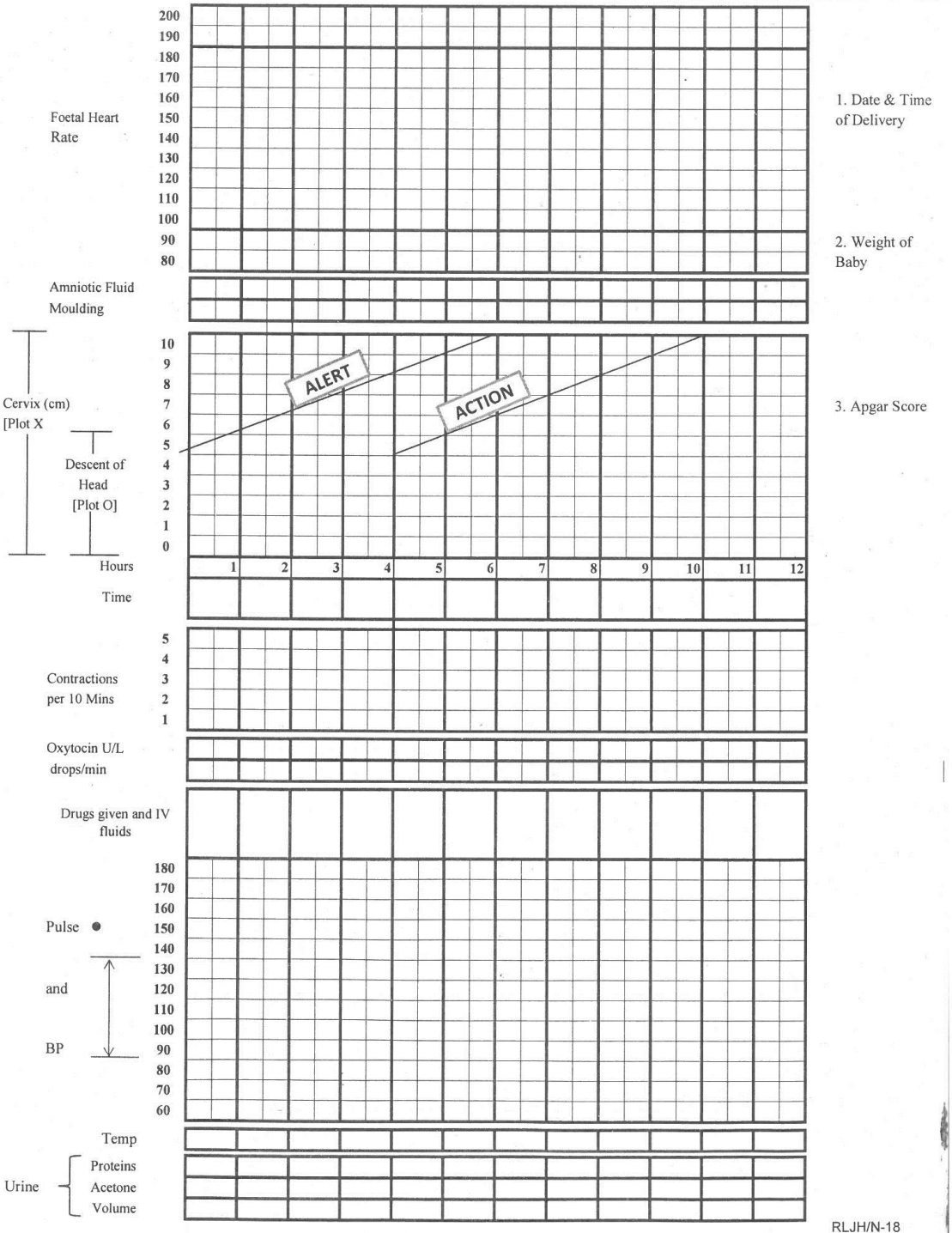
R. L. JALAPPA HOSPITAL & RESEARCH CENTRE

TAMAKA, KOLAR.

PARTOGRAPH (WHO Modified)

Name: Gravida: Para: UHID No:

Date of Admission: Time of Admission: Ruptured Membranes: Hours:



1. Date & Time of Delivery

2. Weight of Baby

3. Apgar Score

RLJH/N-18

KEY TO MASTER CHART

SL NO	WORD	KEY
1	PRIMIGRAVIDA	P
2	MULTIGRAVIDA	M
3	NOT APPLICABLE	NA
4	VAGINAL DELIVERY	VD
5	POST PARTUM HEMORRAGE	PPH
6	BIRTH WEIGHT	B.Wt
7	HYPERBILIRUBINEMIA	HYPERBILI
8	BIRTH INJURY	BIRTH INJ
9	BIRTH ASPHYXIA	BIRTH ASPHY
10	HYPOXIC ISCHEMIC ENCEPHALOPATHY	HIE
11	MECONIUM ASPIRATION SYNDROME	MAS
12	NEONATAL SEPSIS	NEO SEPSIS
13	PUERPERAL PYREXIA/ FEVER	FEVER
14	SPONTANEOUS/INDUCED/AUGMENTED	S/I/A
15	NEONATAL INTENSIVE CARE UNIT	NICU

MASTERCHART

SL. No.	Name	Age	Ip.No.	Primi/ Multi (P/M)	Active phase (hrs)	II Stage Min	Mode of delivery	MATERNAL COMPLICATION	B. Wt kg	Neonatal outcome	I/A/S	Indication	GROUPS	AVERAGE HOSPITAL STAY (DAYS)	NICU ADMISSION
1	Anjamma	24	441581	M	4	30	VD	NIL	2.9	Good	I		I	4	NO
2	Sultana	30	442163	M	5	30	VD	NIL	3.57	Good	S		I	4	NO
3	Chandrika	22	356095	M	7	15	VD	NIL	2.53	Good	I		I	4	NO
4	Manasa	23	420763	M	5	15	VD	NIL	3.3	Good	S		I	4	NO
5	Harshitha	21	442266	P	4.3	30	VD	NIL	2.7	Good	S		I	4	NO
6	Jayalakshmi	29	442153	M	5	20	VD	NIL	3.23	Good	S		I	4	NO
7	Mamata	26	425988	M	5	20	VD	NIL	2.78	Good	S		I	4	NO
8	Gayatri	20	444938	P	5.05	30	VD	NIL	2.75	Good	A		I	4	NO
9	Indraja	23	445415	M	4	15	VD	NIL	3.25	Good	I		I	4	NO
10	Sharada	24	445917	M	06:30	30	VD	NIL	2.8	Good	I		I	4	NO
11	Pankaja	26	447475	P	06:22	30	Outlet forceps	NIL	2.57	HYPERBILI	S	PROTRACTED DESCENT	II	5	YES
12	Malambika	35	357094	M	04:54	10	VD	NIL	3.45	Good	S		I	4	NO
13	Reshma sultana20	20	443569	P	07:12	30	VD	NIL	3.08	Good	A		I	4	NO
14	Rajeshwari	25	436965	P	05:58	40	Outlet forceps	PPH	3.58	BIRTH INJURY	S	PROTRACTED DESCENT	II	6	NO
15	Radha	22	416132	M	05:22	15	VD	NIL	3.03	Good	S		I	4	NO
16	Nagamani	23	446708	P	06:18	30	VD	NIL	2.8	Good	A		I	4	NO
17	Roopa	24	447731	M	03:35	10	VD	NIL	2.6	HIE	I		I	4	NO
18	Aasharani	22	447776	M	04:00	10	VD	NIL	2.8	Good	S		I	4	NO
19	Mamatha	24	445057	M	04:12	10	VD	NIL	3.2	Good	S		I	4	NO
20	Sharavani	22	377286	M	04:58	20	VD	NIL	3.4	Good	S		I	4	NO
21	Hamsaveni	23	448413	P	05:04	30	VD	PPH	2.6	Good	S		I	4	NO

22	Ramya	22	443729	P	05:55	35	VD	NIL	2.57	Good	S		I	4	NO
23	Bhuwaneshwari	30	364380	M	06:46	30	VD	NIL	3.98	Good	I		I	4	NO
24	Roopashree	24	438254	P	07:56	NA	Caesarean	FEVER	3.06	Good	S	ARREST OF DILATATION	III	8	NO
25	Prema	22	376073	P	06:32	27	VD	NIL	3.56	Good	I		I	4	NO
26	Saujanya	23	368164	P	06:15	37	VD	NIL	2.7	Good	I		I	4	NO
27	Rekha	18	450340	P	07:25	35	VD	NIL	3.5	Good	I		I	4	NO
28	Sakamma	25	450303	P	07:00	32	VD	NIL	2.5	Good	A		I	4	NO
29	Uma	20	450751	P	05:25	NA	Caesarean	NIL	3.08	Good	S	FETAL DISTRESS	III	9	NO
30	Mamata	23	448019	M	04:00	10	VD	NIL	2.54	Good	S		I	4	NO
31	Revati joshi	27	447525	M	04:50	15	VD	NIL	3.43	Good	S		I	4	NO
32	Rajamma	28	452257	M	06:30	NA	Caesarean	BLOOD TANSFUSION	3.29	Good	S	ARREST OF DESCENT	III	9	NO
33	Mahamadi	28	452152	M	05:20	10	VD	NIL	05:45	Good	S		I	4	NO
34	Manjula	30	447144	P	03:30	20	VD	NIL	2.87	Good	S		I	4	NO
35	Shruthi	28	377457	M	05:05	8	VD	NIL	3.49	Good	S		I	4	NO
36	Shusmitha	22	448220	P	05:11	28	VD	NIL	2.5	Good	S		I	4	NO
37	Varalakshmi	23	448012	M	04:17	15	VD	NIL	3.35	Good	S		I	4	NO
38	Vijayalakhsmi	20	443770	P	05:30	25	VD	NIL	2.8	Good	S		I	4	NO
39	Sultana	20	454216	P	04:00	28	VD	NIL	3.23	Good	S		I	4	NO
40	Manasa	18	455516	P	05:35	12	VD	NIL	3.39	Good	S		I	4	NO
41	Mamatha	24	455178	M	04:45	15	VD	NIL	3.63	Good	S		I	3	NO
42	Sushma	19	385947	P	03:40	15	VD	NIL	2.8	Good	S		I	4	NO
43	Lavanya	22	448416	M	04:58	25	VD	NIL	3.58	Good	S		I	4	NO
44	Anushamma	22	452533	M	03:41	12	VD	NIL	2.8	Good	S		I	4	NO

45	Mallika	25	456082	P	04:04	12	VD	NIL	3.06	Good	S		I	4	NO
46	Rukmani	21	451181	P	03:56	15	VD	NIL	3.02	Good	S		I	4	NO
47	Usha	26	448256	P	04:38	20	VD	NIL	3.12	Good	S		I	4	NO
48	Anusha	21	416815	P	04:12	40	VD	NIL	2.71	Good	I		I	4	NO
49	Shusheela .m	20	458373	P	04:20	20	VD	NIL	2.96	Good	I		I	4	NO
50	Divya soni	22	457407	P	03:02	10	VD	NIL	2.7	Good	S		I	4	NO
51	Soumya	23	407302	P	03:35	15	VD	NIL	2.5	Good	I		I	4	NO
52	Sujhatha	27	462357	M	04:30	14	VD	NIL	3.3	Good	A		I	4	NO
53	Chaitra	22	460457	P	03:07	15	VD	NIL	2.67	Good	S		I	4	NO
54	Varalakshmi	28	386913	M	04:30	10	VD	NIL	3.23	Good	S		I	4	NO
55	Srividya	27	448234	P	04:08	20	VD	NIL	2.97	Good	S		I	4	NO
56	Sridevi	24	427701	P	06:00	NA	Caesarean	NIL	3.08	BIRTH ASPHY	S	FETAL DISTRESS	III	9	YES
57	Lalitha	26	461273	M	03:05	8	VD	NIL	2.8	Good	S		I	4	NO
58	Sadiquinissa	26	464101	M	04:52	10	VD	NIL	3.15	Good	S		I	4	NO
59	Pavitra	23	461797	P	02:00	10	VD	NIL	3	Good	A		I	4	NO
60	Sujatha	27	129167	M	03:05	15	VD	NIL	3.34	Good	S		I	4	NO
61	Sangeetha	24	462887	P	05:15	42	Outlet forceps	NIL	2.8	HYPERBILI	S	PROTRACTED DESCENT	III	7	YES
62	Ramika	25	379225	P	06:12	45	Outlet forceps	NIL	3.2	NICU	S	PROTRACTED DESCENT	II	7	NO
63	Bhavya	28	464706	M	03:15	20	VD	NIL	3.08	Good	S		I	4	NO
64	Saraswati	21	465197	M	03:10	25	VD	NIL	2.7	Good	S		I	3	NO
65	Lakshmamma	25	466146	P	05:25	NA	Caesarean	NIL	2.86	BIRTH ASPHA	S	ARREST OF DESCENT	II	9	YES
66	Asha	25	467213	M	04:10	10	VD	NIL	2.84	Good	S		I	3	NO
67	Bharati	27	451169	P	04:10	NA	Caesarean	NIL	3.6	BIRTH	S	PROTRACTED	II	9	YES

										ASPHA		DILATATION			
68	Tejeswani	22	454028	M	03:15	20	VD	NIL	2.26	Good	I		I	4	NO
69	Sowmya	25	470726	M	03:10	15	VD	NIL	2.84	Good	S		I	3	NO
70	Shahim	21	388683	P	05:15	40	VD	NIL	2.34	Good	I		I	4	NO
71	Mamatha	24	469215	P	05:02	35	VD	NIL	2.96	Good	I		I	4	NO
72	Nowsheen	20	471857	P	04:40	45	VD	NIL	2.9	Good	S		I	4	NO
73	Subhamma	30	467075	M	03:15	15	VD	NIL	2.95	Good	S		I	4	NO
74	Shilpa	21	475740	M	02:50	14	VD	NIL	3.71	Good	S		I	3	NO
75	Chaitra	25	390445	P	04:45	35	VD	NIL	2.28	Good	S		I	4	NO
76	Rashmi	25	449468	P	06:15	NA	Caesarean	NIL	2.78	HIE	I	PROTRACTED DILATION	III	10	YES
77	Pavitra	24	428040	P	05:40	NA	Caesarean	NIL	2.8	BIRTH ASPHY	S	ARREST OF DILATATION	III	8	YES
78	Prathima	29	406229	P	06:50	10	Ventouse	NIL	2.86	Good	S	ARREST OF DESCENT	II	8	NO
79	Divya	20	455773	P	04:41	30	VD	NIL	3.02	Good	S		I	4	NO
80	Saritha	30	479247	P	08:40	NA	Caesarean	NIL	2.74	BIRTH ASPHY	S	FETAL DISTRESS	III	9	YES
81	Shilpa	20	479330	P	06:38	45	VD	NIL	2.7	Good	S		I	4	NO
82	Ranjitha d	18	479829	P	06:31	40	VD	NIL	2.68	Good	A		I	4	NO
83	Mamaju	24	503041	P	04:48	50	Outlet forceps	NIL	3.46	Good	S	FAILURE OD DESCENT	II	7	NO
84	Lakshmi	23	480265	P	04:40	30	VD	NIL	3.04	Good	S		I	4	NO
85	Jyothi	24	445479	P	06:40	NA	Caesarean	NIL	2.64	BIRTH ASPHY	S	ARREST OF DESCENT	III	8	YES
86	Veda	25	474984	M	04:48	12	VD	NIL	3.02	Good	S		I	4	NO
87	Asha	24	470836	P	05:19	35	VD	NIL	3.2	Good	A		I	4	NO
88	Srilakshmi	23	481578	P	05:02	35	VD	NIL	2.7	Good	S		I	4	NO

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89	Umadevi	24	400905	P	05:36	40	VD	NIL	2.58	Good	S		I	4	NO
90	Sindhu	24	477200	P	05:03	45	VD	NIL	2.34	Good	S		I	4	NO
91	Chaitra	22	406004	P	06:02	30	VD	NIL	3.38	Good	I		I	4	NO
92	Rasika	19	475699	P	05:20	45	VD	NIL	2.84	Good	I		I	4	NO
93	Sugana	29	479657	M	06:48	15	VD	NIL	2.85	Good	I		I	4	NO
94	Soumya	26	479854	M	04:36	15	VD	NIL	3.6	Good	I		I	4	NO
95	Sumi	27	469347	M	04:19	10	VD	NIL	3.24	Good	I		I	4	NO
96	Ramya	24	428001	M	04:26	10	VD	NIL	3.24	Good	I		I	4	NO
97	Aruna	22	478487	M	04:02	8	VD	NIL	3.1	Good	I		I	4	NO
98	Shanthalakhsmi	31	327547	M	04:24	5	VD	NIL	3.45	Good	S		I	4	NO
99	Lavanya	24	412937	P	02:37	45	Outlet forceps	NIL	2.63	BIRTH INJU	S	FETAL DISTRESS	II	6	YES
100	Lakshmi	24	483655	M	04:17	5	VD	NIL	2.7	Good	S		I	4	NO
101	Poongodi	36	478084	M	05:55	30	Ventouse	NIL	3.6	HYPERBILI	S	FETAL DISTRESS	I	6	YES
102	Pushpa	24	405933	M	07:00	NA	Caesarean	NIL	3.18	HIE	S	FETAL DISTRESS	I	9	YES
103	Sumitra	31	485014	P	04:50	20	VD	NIL	3.4	Good	S		I	4	NO
104	Vanajakshi	34	483564	P	04:17	22	VD	NIL	3.45	Good	S		I	4	NO
105	Sunitha	31	485014	P	05:50	32	VD	NIL	3.4	Good	A		I	4	NO
106	Amrin taj	30	485624	M	04:50	15	VD	NIL	3.2	Good	S		I	4	NO
107	Rukamani	21	442498	M	05:28	15	VD	NIL	3.4	Good	S		I	4	NO
108	Vani	29	478622	M	05:20	10	VD	NIL	2.52	Good	S		I	4	NO
109	Ooha	24	486247	P	05:25	NA	Caesarean	NIL	2.72	HIE	S	FETAL DISTRESS	I	4	NO
110	Vani	29	478622	M	05:59	15	VD	NIL	2.5	Good	S		I	4	NO
111	Lavanya	21	479683	P	04:29	30	VD	NIL	2.66	Good	S		I	4	NO
112	Almas	19	478783	P	06:19	30	VD	NIL	3.1	Good	A		I	4	NO

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113	Nandini	25	488171	P	04:10	15	VD	NIL	2.54	Good	S		I	4	NO
114	Almas	19	478783	P	06:19	30	VD	NIL	3.17	Good	S		I	4	NO
115	Jyothi	24	445479	P	05:41	NA	Caesarean	NIL	2.6	Good	S	PROTRACTED DILATATION	III	8	NO
116	Susheela	25	489059	P	06:02	NA	Caesarean	NIL	2.6	Good	S	PROTRACTED DILATATION	III	8	NO
117	Kaveri	21	378764	P	05:20	15	VD	NIL	2.56	Good	S		I	4	NO
118	Ashwani	21	484501	M	04:30	15	VD	NIL	2.58	BIRTH ASPHY	A	PROTRACTED DECENT	II	7	NO
119	Navyashree	23	490332	P	06:00	NA	Caesarean	NIL	3.1	Good	S	ARREST OFDILATATION	III	8	NO
120	Mahalakhsmi	20	490158	P	06:40	31	VD	NIL	3.05	Good	A		I	4	NO
121	Bhagyalakshmi	25	426486	P	03:40	35	VD	NIL	3.17	Good	S		I	4	NO
122	Noori	20	490803	P	06:23	35	VD	NIL	2.54	Good	S		I	4	NO
123	Pammi misra	27	394008	M	05:00	12	VD	NIL	3.1	Good	S		I	4	NO
124	Sumitrama	36	247513	M	05:45	15	VD	NIL	3	Good	S		I	4	NO
125	Farhana taj	25	401502	P	05:55	25	VD	NIL	3.6	Good	I		I	4	YES
126	Suchitra	20	450150	P	05:38	32	VD	NIL	2.88	Good	I		I	4	NO
127	Shanthalakhsmi	31	327458	M	05:24	10	VD	NIL	3.45	Good	A		I	4	NO
128	Varalakshmi	34	483564	P	04:17	36	VD	NIL	3.45	Good	I		I	4	NO
129	Pooja	26	487876	M	03:08	10	VD	NIL	3.05	Good	I		I	4	NO
130	Manjula	22	494263	M	06:05	12	VD	NIL	3.5	Good	I		I	4	NO
131	Manjula	25	494202	M	06:10	8	VD	NIL	2.8	Good	I		I	4	NO
132	Divya	23	445459	P	05:59	32	VD	NIL	2.9	Good	S		I	4	NO
133	Shashikala	27	452677	M	07:03	10	VD	NIL	2.6	Good	S		I	4	NO
134	Anjali	23	498601	M	06:10	12	VD	NIL	2.99	Good	S		I	4	NO
135	Asuryabaad	20	469063	M	05:26	10	VD	NIL	2.6	Good	S		I	4	NO

136	Sowmya	26	500600	M	05:00	NA	Caesarean	NIL	3.5	Good	S	FETAL DISTRESS	I	8	NO
137	Firdose sultan	25	500692	P	05:35	34	VD	NIL	2.5	Good	S		I	4	NO
138	Umadevi	20	449470	P	04:48	35	VD	NIL	3.01	Good	S		I	4	NO
139	Nandini	20	491098	P	06:22	28	VD	NIL	2.37	Good	S		I	4	NO
140	Triveni	19	497201	P	06:38	40	VD	NIL	3.02	Good	S		I	4	NO
141	Nowsheera	23	467867	P	07:19	25	Ventouse	PPH	2.79	NEO SEPSIS	S	PROTRACTED DESCENT	II	6	NO
142	Ashwini	23	500584	P	06:15	45	VD	NIL	3.01	Good	S		I	4	NO
143	Savita	25	450895	P	06:43	40	VD	NIL	2.5	Good	S		I	4	NO
144	Rekha	24	407222	P	07:54	35	Ventouse	NIL	3.38	HYPERBILI	S	PROTRACTED DESCENT	II	6	NO
145	Afsana	30	502151	P	07:00	40	VD	NIL	2.8	Good	I		I	4	NO
146	Mounika	26	505984	P	07:45	35	VD	NIL	2.5	Good	I		I	4	NO
147	Soumya	24	501462	M	06:05	15	VD	NIL	3.05	Good	I		I	4	NO
148	Archana	20	511390	M	03:08	12	VD	NIL	2.86	Good	A		I	4	NO
149	Mallika	23	519082	P	06:00	25	VD	NIL	3.3	Good	I		I	4	NO
150	Veena	25	520000	M	03:21	12	VD	NIL	3.28	Good	A		I	4	NO
151	Amreen neha	18	470012	P	06:50	41	VD	NIL	2.72	Good	I		I	4	NO
152	Lakshmi	22	430896	P	06:17	38	VD	NIL	2.99	Good	I		I	4	NO
153	Suljatha	28	523802	M	05:15	15	VD	NIL	2.66	Good	I		I	4	NO
154	Shilpa	22	521691	M	05:52	10	VD	NIL	3.5	Good	I		I	4	NO
155	Gowthami	25	521608	P	06:17	15	VD	NIL	3.13	Good	I		I	4	NO
156	Priya	24	423588	M	05:53	10	VD	NIL	2.86	Good	A		I	4	NO
157	Lavanya	29	147138	M	05:34	12	VD	NIL	3.06	Good	I		I	4	NO
158	Sowmya	26	514990	M	05:55	10	VD	NIL	2.77	Good	I		I	4	NO

159	Rajeshwari	26	526696	M	04:35	12	VD	NIL	3.1	Good	I		I	4	NO
160	Sindhu	19	531138	P	06:22	15	VD	NIL	2.6	Good	A		I	9	NO
161	Suchitra	24	504480	P	07:00	NA	Caesarean	NIL	3.24	BIRTH ASPHY	S	FETAL DISTRESS	III	4	YES
162	Usha	22	505054	P	05:25	20	VD	NIL	2.85	Good	S		I	4	NO
163	Afreen taj	20	480288	M	05:38	6	VD	NIL	3.45	Good	S		I	4	NO
164	Amurutha	19	505130	P	05:02	26	VD	NIL	2.9	Good	A		I	4	NO
165	Venkaratanamma	20	506358	M	06:42	30	Outlet forceps	NIL	3.14	Good	S	AREEST OF DESCENT	III	4	NO
166	Hema	26	506502	P	06:51	NA	Caesarean	FEVER	3.48	NEO SEPIS	S	FETAL DISTRESS	III	4	NO
167	Pushwati	23	141379	P	07:55	20	Ventouse	NIL	05:16	HYPERBILI	S	PROTRACTED DESECNT	II	4	NO
168	Navya	26	488166	P	05:30	34	VD	NIL	3.1	Good	S		I	4	NO
169	Shilpa	28	511761	M	05:15	10	VD	NIL	2.88	Good	S		I	4	NO
170	Durga	19	511755	P	06:34	35	VD	NIL	3.02	Good	S		I	4	NO
171	Saraswati	30	462496	P	06:00	35	Outlet forceps	NIL	3.8	BIRTH ASPHY	S	ARREST OF DESCENT	II	7	YES
172	Lavanya	22	516159	P	04:53	40	Outlet forceps	NIL	3.53	Good	I	ARREST OF DESCENT	III	7	NO
173	Sowmya	25	143921	P	07:00	NA	Caesarean	NIL	2.8	Good	S	FETAL DISTRESS	I	8	NO
174	Parwatamma	27	513159	M	03:59	11	VD	NIL	2.8	Good	S		I	4	NO
175	Swapna	21	509111	P	06:52	35	VD	NIL	3.09	Good	S		I	4	NO
176	Shreelekha	22	509012	P	06:39	34	VD	NIL	2.8	Good	A		I	4	NO
177	Roohisultana	25	520491	P	03:38	40	VD	NIL	3.05	Good	S		I	4	NO
178	Vasanta	30	515693	M	05:36	10	VD	NIL	3.11	Good	S		I	4	NO
179	Manjula	19	435621	P	05:50	NA	Caesarean	NIL	2.82	Good	S	ARREST OF DILATATION	III	9	NO
180	Vinuta	29	506388	P	05:40	30	VD	NIL	2.5	Good	S		I	4	NO
181	Mangamma	24	421089	P	06:55	35	VD	NIL	2.99	Good	A		I	4	NO
182	Tasmiya	24	521400	M	03:20	NA	Caesarean	NIL	2.8	Good	S	FETAL DISTRESS	III	8	NO

183	Sirisha	19	521296	P	05:15	32	VD	NIL	2.8	Good	S		I	4	NO
184	Lalitha	23	521990	M	04:55	12	VD	NIL	2.95	Good	S		I	4	NO
185	Poornima	30	508933	P	06:12	34	VD	NIL	3.68	Good	I		I	4	NO
186	Sowmya	26	520850	M	04:36	35	VD	NIL	3.52	Good	S		I	4	NO
187	Nagaveni	23	522191	P	06:50	NA	Caesarean	NIL	3.32	Good	S	FETAL DISTRESS	III	8	NO
188	Varalakshmi	26	515887	M	04:55	32	VD	NIL	3.85	BIRTH ASPHY	S		I	4	YES
189	Noor ayesha	23	522450	M	04:41	8	VD	NIL	3.31	Good	S		I	4	NO
190	Prema	23	522922	M	05:51	12	VD	NIL	2.86	Good	S		I	4	NO
191	Shilpashree	23	522535	P	05:33	30	Ventouse	NIL	2.54	Good	S	ARREST OF DESCENT	II	7	NO
192	Vandana	20	522545	P	04:15	32	VD	NIL	3.29	Good	S		I	4	NO
193	Varalakshmi	24	519431	P	07:00	40	VD	NIL	2.5	Good	S		I	4	NO
194	Roja	24	515026	P	05:13	40	VD	FEVER	3.12	NEO SEPSIS	S		I	4	NO
195	Jayashree	22	522995	M	04:21	12	VD	NIL	3.58	Good	S		I	4	NO
196	Afsana	21	481911	P	05:20	NA	Caesarean	NIL	2.5	HIE	I	FETAL DISTRESS	III	8	NO
197	Pavitra	27	517848	M	04:00	12	VD	NIL	2.5	Good	S		I	4	NO
198	Taslim	31	517560	M	04:00	10	VD	NIL	3.5	Good	S		I	4	NO
199	Lavanya	25	524216	P	06:08	35	VD	NIL	3.3	Good	S		I	4	NO
200	Geetha	28	496989	M	04:53	15	VD	NIL	2.7	Good	S		I	4	NO
201	Praveena	25	524534	M	04:38	10	VD	NIL	2.81	Good	S		I	4	NO
202	Supriya	19	525546	P	06:45	32	VD	NIL	3.21	Good	S		I	4	NO
203	Archana	22	520311	P	06:50	40	VD	NIL	2.5	Good	A		I	4	NO
204	Sujatha	20	521619	M	05:25	10	VD	NIL	3.92	Good	S		I	4	NO
205	Nagamani	20	527278	P	05:07	35	VD	NIL	2.46	Good	S		I	4	NO
206	Triveni	24	521390	P	06:10	37	VD	NIL	2.9	Good	I/A		I	4	NO

207	Ayeshaamreen	25	523888	M	05:09	16	VD	NIL	3.15	Good	S		I	3	NO
208	Lakshmi	19	471285	P	05:58	32	VD	NIL	3.1	Good	S		I	4	NO
209	Soumya	24	528473	P	06:01	35	VD	NIL	3.43	Good	S		I	3	NO
210	Pallavi	18	528930	P	05:50	37	VD	NIL	3.08	Good	A		I	4	NO
211	Roopa	22	516674	P	05:21	30	VD	NIL	3.06	HYPERBILI	S		I	4	NO
212	Vatsalya	23	500624	P	05:03	38	Ventouse	NIL	2.9	Good	S	ARREST OF DESCENT	II	6	NO
213	Jyothi	27	451742	P	06:16	30	VD	NIL	3.2	Good	A		I	4	NO
214	Deepthi	20	530001	P	07:05	NA	Caesarean	NIL	2.5	MAS	S	FETAL DISTRESS	III	8	NO
215	Amrutha	19	529334	P	07:02	NA	Caesarean	NIL	2.96	Good	S	FETAL DISTRESS	III	8	NO
216	Vedavathi	22	524528	P	06:01	29	VD	NIL	2.35	Good	S		I	4	NO
217	Nanda kumari	24	147187	P	06:19	35	VD	NIL	2.58	Good	A		I	4	NO
218	Mamatha	28	147105	M	06:01	12	VD	NIL	3.3	Good	S		I	4	NO
219	Padmaja	23	530545	M	04:45	10	VD	NIL	2.96	Good	S		I	4	NO
220	Gayatri	24	531383	P	04:33	28	VD	NIL	2.93	Good	S		I	4	NO
221	Farhana	23	531695	P	06:35	NA	Caesarean	NIL	3.5	Good	S	FETAL DISTRESS	III	8	NO
222	Sindhu	19	533188	P	05:00	38	VD	NIL	2.83	Good	A		I	4	NO
223	Jyothi	21	527157	M	03:58	10	VD	NIL	3.15	Good	S		I	4	NO
224	Swathi	23	511555	M	06:15	8	VD	NIL	3.29	Good	S		I	4	NO
225	Ambika	22	537420	M	04:55	10	VD	NIL	2.9	Good	S		I	4	NO
226	Lavanya	21	533996	M	04:30	12	VD	NIL	3.2	Good	I		I	4	NO
227	Hema	25	478317	P	06:28	30	VD	NIL	3.38	Good	A		I	4	NO
228	Renuka	23	534149	P	05:07	40	VD	NIL	2.5	Good	S		I	4	NO
229	Gayatridevi	23	534823	M	04:22	12	VD	NIL	2.46	Good	S		I	4	NO
230	Hema	25	478317	M	06:28	30	VD	NIL	3.3	Good	S		I	4	NO

									8						
231	Ambika	31	467847	P	06:00	31	VD	NIL	3.04	Good	S		I	4	NO
232	Akshita	21	504990	P	03:36	25	VD	NIL	2.9	Good	S		I	4	NO
233	Marygrace	25	522454	P	06:43	25	VD	NIL	3.22	Good	S		I	4	NO
234	Anitha	27	500164	P	03:21	25	VD	NIL	3.22	Good	A		I	4	NO
235	Suchitra	23	547938	P	06:45	25	Ventouse	NIL	2.89	Good	S	PROTRACTED DESCENT	II	7	NO
236	Nethra	22	548390	P	05:21	25	Ventouse	NIL	2.7	Good	S	PROTRACTED DESCENT	II	7	NO
237	Meena.r	25	548372	M	04:53	35	Outlet forceps	PPH	2.3	NEOSEPSIS	S	PROTRACTED DESCENT	II	7	NO
238	Shilpa	20	361519	P	05:58	40	Outlet forceps	NIL	3.25	Good	S	ARREST OF DESCENT	II	7	NO
239	Pallavi	27	425005	P	04:43	32	VD	NIL	2.9	Good	S		I	4	NO
240	Jyothi	27	549102	M	02:43	20	VD	NIL	2.8	Good	S		I	4	NO
241	Chandrakala	30	562034	P	04:45		VD	NIL	2.8	Good	S		I	4	NO
242	Chaitra	26	551317	M	03:35	10	VD	NIL	3.41	Good	S		I	4	NO
243	Rekha	27	544611	M	04:00	8	VD	NIL	2.97	Good	S		I	4	NO
244	Reshma taj	33	240106	M	05:00	30	Outlet forceps	PPH	3.15	NEOSEPSIS	S	PROTRACTED DESCENT	II	7	NO
245	Jyothi	22	553935	M	02:04	20	VD	NIL	3.1	Good	S		I	4	NO
246	Kavya	22	475797	P	02:48	25	VD	NIL	2.6	Good	I		I	6	NO
247	Chaitra	20	520324	P	05:09	30	Ventouse	NIL	2.76	Good	S	PROTRACTED DESCENT	II	4	NO
248	Kusuma	20	472141	P	03:58	20	Ventouse	NIL	2.85	Good	S	PROTRACTED DESCENT	III	6	NO
249	Ramya	23	562000	P	02:27	25	VD	NIL	2.69	Good	S		I	4	NO
250	Mounika	23	155738	P	03:08	30	VD	NIL	2.6	Good	S		I	4	NO
O	Chaitra	20	562522	P	02:22	35	VD	NIL	2.79	Good	S		I	4	NO
252	Sindhu	20	558133	P	05:45	31	Outlet forceps	FEVER	2.47	NEO SEPSIS	I	PROTRACTED DESCENT	II	7	NO
253	Radhamma	22	564507	P	04:55	30	VD	NIL	2.9	Good	I		I	4	YES

254	Bhavani	25	556515	P	06:28	NA	Caesarean	NIL	3.8	Good	S	PROTRACTED DILATATON	III	8	YES
255	Asha	26	558414	P	05:09	35	VD	NIL	2.76	Good	I/A		I	4	YES
256	Netravati	24	566648	P	04:17	30	Ventouse	NIL	3.34	Good	S	FETAL DISTRESS	I	6	YES
257	Heena kouser	26	566994	P	03:40	35	VD	NIL	2.4	Good	A		I	4	NO
258	Savitha	27	560974	P	05:02	15	VD	NIL	3.1	Good	A		I	4	NO
259	Kavya	22	573134	P	04:16	32	VD	NIL	3.39	Good	I		I	4	NO
260	Kaveri	19	574833	P	05:59	30	VD	NIL	2.7	Good	A		I	4	NO
261	Jyothi	22	573911	P	02:49	35	VD	NIL	2.64	Good	I		I	4	NO
262	Malathi	23	571198	M	02:32	35	Ventouse	NIL	3.23	Good	A	FETAL DISTRESS	I	4	NO
263	Nagaveni	21	574789	P	04:54	30	VD	NIL	2.81	Good	I		I	7	NO
264	Ashwini	24	574890	P	03:48	40	Outlet forceps	FEVER	2.9	NEO SEPSIS	A	ARREST OF DESCENT	II	8	NO
265	Saritha	20	574898	P	04:45	25	VD	NIL	2.47	Good	A		I	4	NO
266	Sukanya	23	574968	M	02:29	15	VD	NIL	2.9	Good	S		I	4	NO
267	Geetha	20	575432	P	02:48	25	VD	NIL	3.01	Good	A		I	4	NO
268	Shalaya	33	511169	M	02:40	10	VD	NIL	2.78	Good	S		I	4	NO
269	Kavita	26	576127	P	02:44	30	VD	NIL	2.56	Good	A		I	4	NO
270	Poornima	26	500742	P	03:30	35	VD	NIL	2.6	Good	I		I	4	NO
271	Subha	28	573112	M	04:53	8	VD	NIL	3.84	Good	A		I	4	NO
272	Jayanti	20	577375	P	05:22	30	VD	NIL	2.76	Good	A		I	4	NO
273	Gayatri	22	570094	M	03:40	12	VD	NIL	3.08	Good	S		I	4	NO
274	Mahanandi	21	577989	P	04:26	30	VD	NIL	2.6	Good	S		I	4	NO
275	Heenataj	24	542011	P	02:56	35	VD	NIL	2.7	Good	S		I	4	NO
276	Bindu	23	485198	P	04:57	25	VD	NIL	3.2	Good	A		I	4	NO
277	Sujatha	25	508981	M	05:43	12	VD	NIL	3.2	Good	A		I	4	NO

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278	Sharada	29	509076	P	03:26	32	VD	NIL	2.5	Good	S		I	4	NO
279	Pushpa	29	579784	M	08:39	NA	Caesarean	PPH	3.36	NEO SEPSIS	S	ARREST OF DESCENT	III	9	YES
280	Goushiya	24	493361	P	06:57	NA	Caesarean	NIL	2.88	MAS	S	FETAL DISTRESS	III	8	YES
281	Chowdamma	22	570478	P	01:30	30	Ventouse	NIL	2.55	Good	S	FETAL DISTRESS	II	6	NO
282	Ambika	22	580320	P	03:15	NA	Caesarean	NIL	3.1	Good	S	FETAL DISTRESS	III	9	NO
283	Nagaveni	27	581215	P	02:00	NA	Caesarean	NIL	2.5	Good	S	FETAL DISTRESS	III	9	NO
284	Monica	20	582680	M	01:12	30	VD	NIL	2.7	Good	S		I	4	NO
285	Bharathi	21	557584	P	05:28	NA	Caesarean	NIL	2.8	Good	S	FETAL DISTRESS	I	8	NO
286	Archana	22	583034	P	03:10	28	VD	NIL	2.92	Good	S		I	4	NO
287	Nanda kumari	23	582821	M	03:08	20	VD	NIL	2.84	Good	I		I	4	NO
288	Sushmita	19	581091	P	03:48	35	VD	NIL	3.01	Good	I		I	4	NO
289	Veena	22	585583	P	03:31	32	VD	NIL	2.57	Good	S		I	4	NO
290	Mamatha	22	578916	M	02:42	10	VD	NIL	2.9	Good	I/A		I	4	NO
291	Ashwani	22	587242	P	04:10	35	VD	NIL	3.32	Good	I		I	4	NO
292	Ikhera begum	24	588558	P	02:23	35	VD	NIL	2.55	Good	S		I	4	NO
293	Pavitra	25	510751	P	02:13	32	VD	NIL	2.3	Good	S		I	4	NO
294	Archana	26	515104	P	02:35	35	VD	NIL	2.9	Good	S		I	4	NO
295	Monica	28	589244	M	05:22	12	VD	NIL	3.22	Good	S		I	4	NO
296	Mala	27	538843	M	04:30	7	VD	NIL	2.7	Good	S		I	4	NO
297	Rani	21	589732	P	03:14	32	VD	NIL	2.85	Good	S		I	4	NO
298	Ruksana	20	589731	P	05:10	28	VD	NIL	3.22	Good	S		I	4	NO
299	Ranjitha	23	525837	M	04:56	12	VD	NIL	3.01	Good	S		I	4	NO
300	Netravathi	19	573935	P	03:04	25	VD	NIL	2.98	Good	S		I	4	NO
301	Pallavi	23	591719	M	02:40	10	VD	NIL	2.5	Good	S		I	4	NO

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302	Nagaveni	23	592954	M	01:55	10	VD	NIL	2.78	Good	S		I	4	NO
303	Sushma	29	589878	M	02:28	12	VD	NIL	2.64	Good	S		I	4	NO
304	Umavati	19	516320	P	03:55	32	VD	NIL	2.65	Good	S		I	4	NO
305	Shabreen	24	558472	M	02:45	15	VD	NIL	2.98	Good	S		I	4	NO
306	Manjula	21	564616	P	05:10	40	VD	NIL	2.92	Good	S		I	4	NO
307	Ramya	23	509035	P	06:09	38	VD	NIL	2.34	Good	S		I	4	NO
308	Roja	24	600696	M	02:20	10	VD	NIL	2.4	Good	S		I	4	NO
309	Haritha	21	608531	P	00:00	30	VD	NIL	2.9	Good	S		I	4	NO
310	Afisa	28	608526	M	02:36	12	VD	NIL	3.32	Good	S		I	4	NO
311	Kanchana	26	608001	M	04:57	12	VD	NIL	2.57	Good	S		I	4	NO
312	Meena.r	25	548372	M	04:12	35	Outlet forceps	NIL	2.3	Good	I	ARREST OF DESCENT	II	7	NO
313	Shilpa	20	361519	P	05:15	50	Outlet forceps	NIL	3.25	Good	S	PROTRACTED DESCENT	II	6	NO
314	Komala	22	534216	M	02:59	8	VD	NIL	3.3	Good	S		I	4	NO
315	Supriya	20	599864	P	05:45	NA	Caesarean	NIL	2.94	Good	I	FETAL DISTRESS	II	8	NO
316	Shilpa	20	361519	P	05:15	50	Outlet forceps	NIL	3.25	Good	S	ARREST OF DESCENT	I	7	NO
317	Lavanya	19	600843	P	03:08	25	VD	BLOOD TANSFUSION	2.4	NEO SEPSIS	S		I	4	NO
318	Radha	23	601507	P	02:45	30	VD	NIL	2.63	Good	S		I	4	NO
319	Suma	20	601966	P	02:20	45	Outlet forceps	NIL	3.82	Good	S	PROTRACTED DESCENT	II	6	NO
320	Ayesha sultana	18	581579	P	04:21	40	VD	NIL	2.7	Good	S		I	4	NO
321	Suma	19	593997	M	02:07	10	VD	NIL	2.3	Good	S		I	5	NO
322	Keerthi	18	602785	P	03:45	10	VD	NIL	3.16	Good	I		I	4	NO
323	Swapna	22	603330	M	03:01	7	VD	NIL	2.8	Good	I		I	4	NO

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324	Ashwani	25	520593	M	01:50	32	Ventouse	NIL	2.9	BIRTH ASPHY	S	FETAL DISTRESS	I	6	YES
325	Roopa	28	604172	M	02:16	12	VD	NIL	3.1	BIRTH ASPHY	A		I	4	NO
326	Baby	24	516903	P	02:40	45	Outlet forceps	NIL	2.9	Good	S	FETAL DISTRESS	I	7	NO
327	Harshita	19	608531	P	04:33	33	VD	NIL	2.9	Good	A		I	4	NO
328	Deepika	22	599147	P	03:00	40	VD	NIL	3.24	Good	I		I	4	NO
329	Shweta.r	29	581651	P	02:41	20	Ventouse	NIL	3.13	HYPERBILI	I	FETAL DISTRESS	I	8	NO
330	Nethvathi	21	527041	P	04:02	20	Ventouse	NIL	3.13	Good	S	PROTRACTED DESCENT	III	6	NO
331	Asha rana	28	601044	P	01:20	35	VD	NIL	2.75	Good	I		I	4	NO
332	Afsana taj	26	600602	M	04:49	12	VD	FEVER	2.78	NEO SEPSIS	A		I	6	YES
333	Ayesha sultana	18	581579	P	04:21	25	VD	NIL	2.7	Good	S		I	4	NO
334	Jyothi	19	605892	P	02:19	25	Ventouse	NIL	2.96	HYPERBILI	S	FETAL DISTRESS	I	8	NO
335	Bindu	19	606756	P	02:15	35	VD	NIL	2.92	Good	I		I	3	NO
336	Nagaveni	23	606432	M	03:10	10	VD	NIL	2.95	Good	I		I	3	NO
337	Kavitha	27	584490	M	05:30	NA	Caesarean	NIL	4.04	BIRTH ASPHY	S	FETAL DISTRESS	III	8	YES
338	Veena	25	607576	P	04:17	30	VD	NIL	2.6	Good	A		I	4	YES
339	Pratima	22	586385	M	02:36	15	VD	NIL	3.04	Good	I		I	4	NO
340	Roja	23	566562	P	03:22	28	VD	NIL	3.17	Good	S		I	4	NO
340	Suma	20	601966	P	02:20	30	Outlet forceps	NIL	3.82	BIRTH ASPHY	S	PROTRACTED DESCENT	II	7	YES
342	Premlatha	35	612350	M	03:30	10	VD	NIL	3.45	Good	S		I	4	NO
343	Shipa	30	621764	M	04:15	11	VD	NIL	3.4	Good	S		I	4	NO
344	Pallavi	20	622104	P	06:15	35	VD	NIL	2.64	Good	S		I	4	NO
345	Puspa	25	591340	M	03:20	25	Ventouse	NIL	2.6	Good	S	PROTRACTED	II	7	NO

												DESCENT			
346	Shwetha	22	619496	P	06:30	NA	Caesarean	NIL	2.84	BIRTH ASPHY	S/A	FETAL DISTRESS	III	9	YES
347	Lavanya	22	620345	P	05:25	35	VD	NIL	2.47	Good	A		I	4	NO
348	Netrawathi	32	564637	M	03:45	8	VD	PPH	3.4	Good	I		I	4	NO
349	Gayatri	19	621246	P	05:10	30	VD	NIL	3.27	Good	S		I	4	NO
350	Kavitha	22	547148	M	03:30	10	VD	NIL	3.56	Good	S		I	4	NO
351	Navneeta	21	601298	P	05:25	45	VD	NIL	3.21	Good	S		I	4	NO