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Original Research Article

Comparison of spontaneous labour with induced labour in nulliparous women using modified WHO partograph

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ABSTRACT

Background: Childbirth is the period from the onset of regular uterine contraction until expulsion of placenta. The process by which this normally occurs is called labour. Induction of labour is the artificial initiation of uterine contraction prior to their spontaneous onset, leading to progressive dilatation and effacement of the cervix and delivery of the baby. Labour induction is indicated where the benefits to either the mother or the fetus outweighs the benefit of continuing pregnancy. The aim and objectives of the study was to study the progress of labour in nulliparous women who are having spontaneous labour and in those with induced labour in terms of augmentation of labour, mode of delivery, neonatal outcome and maternal complication.

Methods: This was a randomized comparative study. The study was conducted in department of Obstetrics and Gynaecology at a tertiary care private centre during time period of May 2014 to May 2015 on 120 pregnant women divided into two groups i.e. A and B consisting of 60 women each. All women were nulliparous and ≥ 37 weeks of gestation age. Those women who had spontaneous onset of labour and reached ≥ 4cm cervical dilatation were included in group A and those who were induced with 25 mcg misoprostol vaginally and reached ≥ 4cm of cervical dilatation were included in group B. Progress of labour was monitored by Modified WHO partograph.

Results: The mean duration of labour after 4cm of cervical dilation in spontaneous labour onset group was 5.43 hours and in the induced group was 5.41 hours with p value0.865, which was statistically not significant. In spontaneous labour onset group, 39.3% of patients required augmentation of labour with oxytocin compared to 69% of induced group (p value-0.001). More women had vaginal delivery in spontaneous onset labour group (73.3%) comparative to induced group (53.3%) with pvalue-0.023. There was less caesarean section among those in spontaneous labour than induced labour (20% versus 41.7%) (p=0.010).While most women of induced labour cases reached or crossed action line compared to spontaneous labour (35% versus 16.7%) p=0.022 ,there were more cases in spontaneous labour moving between alert and action line (23.3% versus 10%) p=0.049 .Neonatal outcome and maternal complications were similar in both the group .

Conclusions: We conclude from this study that requirement of augmentation for progress of labour was more in induced group, rate of caesarean section was also high but it does not adversely affect the neonatal outcome and maternal complication if labour is monitored with Modified WHO partograph.

Keywords: Augmentation of labour, Induced labour, Neonatal outcome, Partograph

INTRODUCTION

Childbirth is the period from the onset of regular uterine contraction until expulsion of placenta. The process by which this normally occurs is called labour.[1] WHO defines normal birth as: spontaneous in onset, low risk at the start of labour and remaining so throughout labour and delivery. The infant is born spontaneously in the vertex position between 37 to 42 completed weeks of pregnancy, and mother and infant are in good condition after birth.[2]

To be successful, induction of labour must fulfil three aims. First: it should result in labour namely adequate

uterine contractions and progressive dilatation of cervix. Second: this labour should result in vaginal delivery, as there is little purpose in bringing about labour as a mere preparation for caesarean section. Third: in viable pregnancies, these aims must be achieved with minimum discomfort and risk to both mother and foetus.

The first WHO partograph or 'Composite partograph', covers a latent phase of labour of up to 8 hours and an active phase beginning when the cervical dilatation reaches 3 cm. The active phase is provided with an alert line and an action line, drawn 4 hours apart on the partograph as aids to monitoring labour. This partograph is based on the principle that during active labour, the rate of cervical dilation should not be slower than 1 cm/hour. A lag time of 4 hours between slowing of labour and the need for intervention is unlikely to compromise the foetus or the mother and avoids unnecessary intervention.

Moreover, differentiating the latent phase from false labour being difficult, diagnosis is often made in retrospect.[3] To alleviate these disadvantages, a WHO 'Modified Partograph' was introduced by removing the latent phase and considering the beginning of active phase at 4 cm dilatation of cervix instead of 3 cm. There were some other minor changes which include considering two squares in 1 hour instead of one square in 1 hour in cervical dilatation curve.[4]

WHO further modified the partograph for the third time, this time for used by skilled attendants in health centre. This simplified partograph is colour coded. The area to the left of the alert line in the cervicograph is coloured green, representing normal progress. The area to the right of the action line is coloured red indicating dangerously slow progress in labour. The area in between the alert and action line is coloured amber, indicating the need for greater vigilance.[5]

The aim and objectives of the study was to study the progress of labour in nulliparous women who are having spontaneous labour and in those with induced labour in terms of augmentation of labour, mode of delivery, neonatal outcome and maternal complication.

METHODS

A randomized comparative study was conducted from May 2014 to May 2015.

The primary variable tested was induction-delivery. With reference to previous studies, a 15% difference in induction–delivery interval between any of two groups for a type 1error 0.05 and a power of 80%. A sample size of 120 was calculated to detect a significant difference.

The study was conducted in pregnant nulliparous women coming at term in active phase of Labour (with cervical dilatation at least 4 cm) either spontaneous or induced with 25mcg vaginal misoprostol**.** The study population was divided into two equal groups:

- Labour induced with vaginal prostaglandin (misoprostol) and who reached ≥4cm dilation.
- Spontaneous onset of labour, who reached ≥4cm dilatation.

The study received approval from the institutional ethics committee and all participants gave written informed consent. A computer generated randomized list was prepared to enrol the participants in the study.

Inclusion criteria

- Pregnant nulliparous Women
- Live foetus
- Singleton pregnancy
- Vertex presenting pregnancy
- Gestational Age ≥ 37 weeks
- Active phase of labour with cervical dilation at least 4cm
- Either spontaneous or induced

Patient who had spontaneous onset of labour and reached ≥4cm of cervical dilation were included in group A and patient who were induced with 25mcg misoprostol and reached ≥4cm were included in group B, and progress of labour was monitored by modified WHO partograph. Foetal heart rate was recorded half hourly. The state of membrane "I" if membranes are intact, "C" if membranes were ruptured and liquor clear, "M" if membranes were ruptured and liquor meconium stained. Moulding of head at initial examination and subsequent vaginal examination was noted and scoring was done as + or ++. The most important measures of progress in labour, the rate of dilatation of the cervix and the rate of descent of the foetal presenting part, were recorded by plotting the cervical dilation on the vertical line on the left hand side of the graph in centimetres from 4 to 10 cm.

RESULTS

The present study was conducted in department of obstetrics and gynecology at a private tertiary care institute of New Delhi on 120 women. Table 1 shows the general characteristics among study participants which were comparable in terms of age, weight, height and BMI.

The above table shows the requirement of augmentation of labour in groups A and B. We observed that 22 (36.7%) out of 60 women in group A required augmentation with oxytocin for progress of labour as compared to 40 (66.7%) out of 60 women in group B with p value 0.001 which was statistically significant.

It was observed that 10 (16.7%) out of 60 women in group A had reached or crossed action line as compared to 21 (35%) out of 60 women in group B with p value of 0.022 which was statistically significant.

Table 1: General characteristics of study participants.

Variables	Group A (n=60)	Group B (n=60)	P value
Age (years)	27.17 ± 1.14	26.95±1.1	0.290
Weight (kgs)	60.6±3.03	61±2.19	0.409
Height (cms)	156.74±2.13	156.44±1.71	0.400
BMI	24.67±1.19	24.93±0.98	0.194
GA (weeks)	39.32±.91	39.63±1.07	0.084
Cervical dilatation	4.48±0.65	4.4±0.62	0.473
Descent of head	3.33±0.48	3.2±0.44	0.115

Table 2: Augmentation of labour with oxytocin.

Augmentation	Group A (n=60)	Group B (n=60)	P value
Yes	22 (36.7%)	40(66.7%)	0.001
No	38 (63.3%)	20(33.3%)	

Table 3: Cervicograph reaching or crossing Action line.

Cervicograph	Group A (n=60)	Group B (n=60)	P value
Reaching/crossing action line	10(16.7%)	21(35%)	0.001
None	50(83.3%)	39(65%)	

Table 4: Mode of delivery.

Mode of delivery	Group A (n=60)	Group B (n=60)	P value
Vaginal delivery	44 (73.3%)	32 (53.3%)	0.023
Caesarean section	12 (20%)	25 (41.7%)	0.010
Instrumental VD	04 (6.7%)	03 (5%)	0.997

Table 5: Neonatal outcome.

Parameters	Group A (n=60)	Group B (n=60)	P value
Birth weight	3±.19	2.98±0.2	0.621
Apgar score at 1 min	7.1± 1.22	7.17 ± 1.2	0.763
Apgar score at 5 min	9.38 ± .8	9.33 ± .8	0.733

Table 2 shows the mode of delivery. There was an increased vaginal delivery in group A whereas caesarean section was increased in group B. This was statistically significant.

Table 4 shows the mode of delivery. There was an increased vaginal delivery in group A whereas caesarean section was increased in group B. This was statistically significant.

Table 6: Maternal outcome.

Complication	Group A (n=60)	Group B (n=60)	P value
No	57(95%)	53(88.3%)	0.19
Perineal tear	2(3.3%)	1(1.7%)	1.00
PPH	1(1.7%)	4(6.7%)	0.36
Tachysystole	0(0%)	1(1.7%)	1.00
Cervical tear	0(0%)	1(1.7%)	1.00

Table 5 and 6 shows the neonatal and maternal outcome among the two study groups. There was similar occurrence of events in both groups when compared for maternal and neonatal events.

DISCUSSION

Induction of labour is one of the common interventions in obstetrics and is not without risk. In many circumstances, induction of labour may either result in an increase or a decrease in maternal or perinatal morbidity.

In present study, 40 (66.7%) women in group B required augmentation of labour with oxytocin as compared to 22 (36.7%) women in group A. The difference between two groups was statistically significant (p =0.001). Similar to our study, Selo-Ojeme D et al conducted a study and they also concluded a higher rate of requirement of augmentation with oxytocin among those who had induced labour and in a study conducted by Alyasin ZT et al, they also found need for oxytocin was significantly increased in the induced group.[6,7] Hence we concluded that augmentation is needed frequently in induced group compared to spontaneous group, but, keeping in mind that oxytocin is associated with increased risk of abnormal fetal heart pattern, so proper monitoring of labour and dose titration according to uterine contraction is necessary in patients undergoing induced labour.

We found that more women in the induced group reached or crossed action line (35% versus 16.7%) as compared to spontaneous group and this was found statistically significant (p=0.022). Hence, we concluded that due to timely intervention most of the patient had normal active phase Our study was comparable to a study done by Orji EO et al[8] in which they also found similar results i.e. 55.1% patients had normal active phase, 27.9% patients moved between alert and action line and 16.9% patients reached or crossed action line in spontaneous group while 57.4% patients had normal active phase 9.6 % patients moved between alert and action line and 33.1 % patients reached or crossed action line in induced group. In another study done by Murlidhar L et al, found that when cervical dilatation was on the left of the alert line, more vaginal deliveries occurred and babies had good APGAR score compared to those, whose cervical dilatation moved between alert and action line or crossed or reached action line.[9]

Regarding mode of delivery, spontaneous onset of labour had more vaginal delivery compared to induced labour group while vice versa for caesarean section. Our results were similar to the study done by Orji EO et al, in which they concluded that larger proportion of women in spontaneous group had vaginal delivery compared to induced group and also lesser proportion of caesarean section in spontaneous group.[8] Alyasin ZT et al, conducted a study and they compared elective labour induction with spontaneous onset of labour in post-dated pregnancy and they concluded that rate of caesarean section was more in induced group.[7] In a study done by Jankiraman V et al, they concluded that induced nulliparous had increased rate of caesarean section compared spontaneous onset labour.[10]

Regarding neonatal outcome, both groups had similar events. Orji EO et al conducted a study and they found that induced group had better APGAR at one and five minutes compared to spontaneous group.[8] A study done by Selo-Ojeme D et al, in which they concluded that Apgar <5 at 5 minutes was more common in induced group compared to spontaneous group.[6] For maternal complications also, both groups had similar events. Similar to our study Alyasin ZT et al in their study found no significant difference in spontaneous and induced group.[7] In an another study done by Kudagi LB et al, they compared intra-vaginal misoprostol with intracervical dinoprostone gel for induction of labour and they found that no significant difference in maternal complications in both the groups.[11]

CONCLUSION

We conclude from this study that requirement of augmentation for progress of labour was more in induced group, rate of caesarean section was also high but it does not adversely affect the neonatal outcome and maternal complication if labour is monitored with Modified WHO partograph.

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