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Original Research Article

Compare the effect of amniotomy and oxytocin infusion in duration of labour

Katta Jyothi, Senadhipathi Shakunthala*

Department of Obstetrics and Gynecology, Government Medical College, Nalgonda, Telangana, India

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***Correspondence:**

Dr. Senadhipathi Shakunthala,

E-mail: drsujathapasula@gmail.com

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ABSTRACT

Background: Labour is a unique experience in a women's life, it is a physiological but painful event. It is a dynamic and continuous process which cumulates in the birth of a healthy baby followed by expulsion of the placenta and the membranes. The objective of this study was to determine the effectiveness of amniotomy and oxytocin in terms of duration of labour, mode of delivery and maternal and fetal outcome.

Methods: A non-randomized comparative study of accelerating effect of oxytocin and amniotomy has been studied, in the age group of 19-30 years, who are admitted in obstetric ward 200 primigravidae were studied out of which 100 belongs to control group and 100 study group.

Results: In the study series 93 cases had labour lasting less than 4 hours when compared to only. The mean total duration of labour is reduced in study group with a difference of 204 minutes. Quantity and duration of blood loss is significantly less in study group when compared to control group. There was no significant difference in terms of mode of delivery, maternal and foetal outcome between the two groups.

Conclusions: Oxytocin infusion combined with amniotomy is safe and effective in accelerating the first and second stage of labour in apparently normal cases. No statistically significant adverse effects were noted with oxytocin infusion and amniotomy.

Keywords: Amniotomy, Duration of blood loss, Oxytocin infusion

INTRODUCTION

Labour is a unique experience in a women's life, it is a physiological but painful event. The agony a woman suffers is beyond description. It is a dynamic and continuous process which cumulates in the birth of a healthy baby followed by expulsion of the placenta and the membranes. Labour is characterized by "the presence of uterine contractions of sufficient frequency, duration, and intensity to cause demonstrable effacement and dilation of the cervix and progressive descent of fetus through the birth canal". Labour may be prolonged either due to ineffective uterine contractions or failure of the cervix to dilate. If it is prolonged and tedious it may

produce a picture of mental anguish and physical morbidity to the mother. For the newborn child, a prolonged labour will pose danger to its survival and subsequent neurological development.¹ Our responsibility as obstetrician has become critical in providing a health mother with an undamaged healthy child. Hence both the obstetrician and the women in labour would like to accomplish the delivery in the shortest possible time without compromise on the maternal and fetal safety. Along with amniotomy and early administration of oxytocin are used to hasten the labour.²

Concepts of acceleration of labour represent a complete break against the traditional attitude of watchful

expectancy. It reduced the complications related to prolonged labour.

Prolonged labour is an important cause of maternal morbidity and contributes significantly to the half a million women who die annually as a result to child birth. Dystocia in women accounts for approximately one-half of all primary Caesarean sections.

Management of labour principles to shorten labour and achieve efficient uterine contractions to affect spontaneous delivery in primigravida patients. Active management of labour protocol consists of an accurate diagnosis of labour. Early amniotomy, frequent vaginal examinations, high dose oxytocin augmentation for slow labour progress (cervical dilatation less than 1 cm/hour), and continuous professional social support.³

Oxytocin is a polypeptide with amino acid residues, synthesized in the neural cell bodies of hypothalamic nuclei and transported to posterior pituitary gland. Oxytocin increases the force and frequency of uterine contractions. Increase in contractility is due to heightened electrical activity of the myometrial cell membranes. The mechanism by which amniotomy speed up labour remains unclear. It is thought that when the membranes are ruptured, the production and release of prostaglandins and oxytocin increases, resulting in stronger contractions and quicker cervical dilatation.¹⁰

The objective of this study was to compare the effect of amniotomy and oxytocin infusion with the control group on the duration of 1st and 2nd stages of labour.

METHODS

Prospective study done in Department of Gynaecology and Obstetrics in 200 term pregnancy primigravida women for a period of 2 years with consent obtained from patients.

Inclusion criteria

- Term primigravidae
- Vertex presentation,
- Who has set into spontaneous labour
- Have 3-4 cm of cervical dilatation.

Exclusion criteria

- Multi gravidae
- Multiple gestation
- Malpresentation
- Cephalo pelvic disproportion
- Any known medical and obstetric complications and age below 18 years and above 32 years.

The Outcome of duration of 1st and 2nd stages of labour, mode of delivery, 3rd stage blood, maternal outcome, fetal

outcome. After taking detailed history and general examination, height of the funds, lie, presentation and frequency, intensity and duration of contractions were recorded by abdominal examination. Foetal heart sounds were checked for rate and regularity. Cardiotocography was done.

A preliminary sterile vaginal examination and pelvic assessment was performed to see the condition, effacement and dilatation of cervix, and to confirm that membranes were intact.

Women confirmed to be in active phase of labour when having cervix dilated at least 3-4 cm were enrolled for the study. After obtaining the informed consent, subjects were alternatively chosen as control group and study group.

Control group: (n=100)

Patients were left for progress of labour with intact membranes and no oxytocin augmentation.

Study group: (n=100)

Amniotomy was done at the onset of active labour (at 3-4 cm dilatation with fully effaced cervix) and 5 units oxytocin in 500 ml of RL was started simultaneously at the rate of 5 ml/min units/min (8 drops/min) and titrated half an hourly till adequate contractions achieved (3-4 contractions, lasting for 40-50 seconds in 10 minutes).

The membranes were ruptured by using Kocker's forceps in a controlled manner under aseptic measures with prophylactic antibiotics cover. The liquor was allowed to drain, while keeping two fingers in vagina making sure that the fluid drained slowly thus avoiding cord prolapsed and placental abruption. Colour of liquor was noted, whether colourless meconium or blood stained. If the colour of liquor was green or blood stained, patients were excluded from the study.

Monitoring during the first stage of labour include

- 4th hourly temperature
- Hourly pulse and blood pressure
- Half-hourly documentation of frequency of contractions
- Frequency of emptying the bladder
- Vaginal examination offered every 2 hours for study group and every 4 hours for control group
- Intermittent electronic monitoring of the fetal heart after a contraction for at least 1 minute, every 15 minutes.

Monitoring during the second stage of labour

- Hourly blood pressure and pulse
- Continued 4 hourly temperature

- Vaginal examination offered hourly in the second stage
- Documentation of the frequency of contractions every 10 minutes
- Frequency of emptying the bladder.

Assessment of progress by observing maternal behaviour, effectiveness of pulsing and fetal wellbeing. Intermittent electronic monitoring of the fetal heart after a contraction for at least 1 minute, every 5 minutes. Partogram was maintained for both the groups to see the progress of labour. Continuous CTG monitoring was carried out in suspected cases. In abnormal CTG cases emergency caesarean section was performed, while normal CTG cases monitoring of labour was continued. Fetal distress or non-reassuring fetal heart rate was defined as the presence of repeated late or severe variable decelerations loss of beat to beat variability not related to analgesia administration or persistent tachycardia over 160 beats/minute.

Parameters taken immediately after delivery

Baby assessed for Apgar score, 3rd stage blood loss assessed by weighing the mops before and after soakage, mother general physical condition. Injection Methergin 0.2ml i.m. given for both groups. Oxytocin drip continued for 2-4 hours after delivery for study group.

Observations during puerperium

*The mother observed during puerperium for temperature, pulse rate, blood pressure, uterine involution, lochia, and successful voiding of the woman's bladder.

*The new born for NICU admissions.

RESULTS

Table 1: Demographic distribution of both the groups.

Age in years	Control group N=100	Study group N=100	P-Value
19-21	71	60	>0.05
22-24	20	30	>0.05
25-27	8	9	>0.05
28-30	1	1	>0.05
Duration of labour in hours			
0-4	32 (33.3)	93 (94.8)	.001
5-8	43 (44.7)	4 (4.1)	.001
9-12	21 (21.8)	1 (1.0)	.001

Total numbers of cases included in the study were 200 out of which 100 cases are taken as study group and 100 cases as control group.

Most of the people are in 19-21 years in both study and control group. In the study series 93% had labour lasting

less than 4 hours when compared to only 32% cases in control series. In control group 4 cases and in study group 2 cases underwent caesarean section.

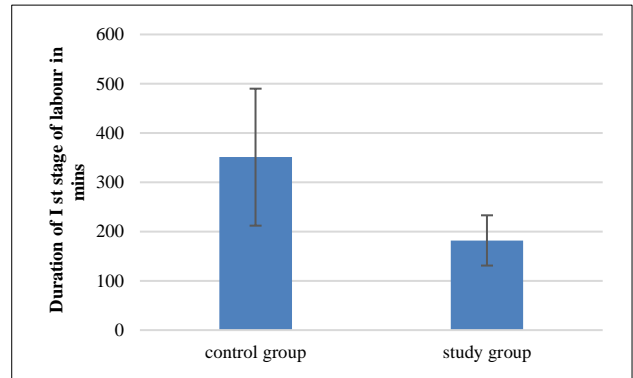


Figure 1: Comparison of mean duration of first stage of labour in both the groups.

The mean duration of 1st stage of labour in control group is 351.4±139.72 minutes when compared to study group which is 182±51.54 minutes which is significant (p-value->0.01).

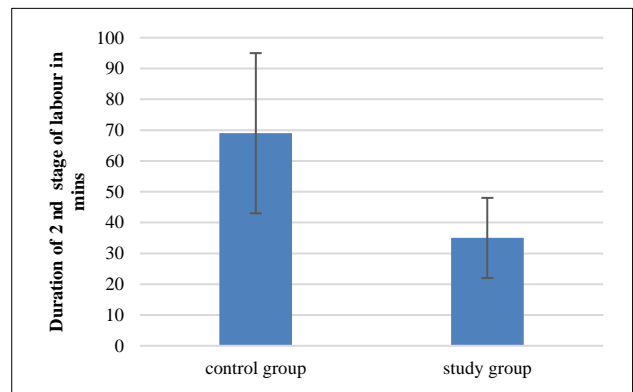


Figure 2: Comparison of mean duration of second stage of labour in both the groups.

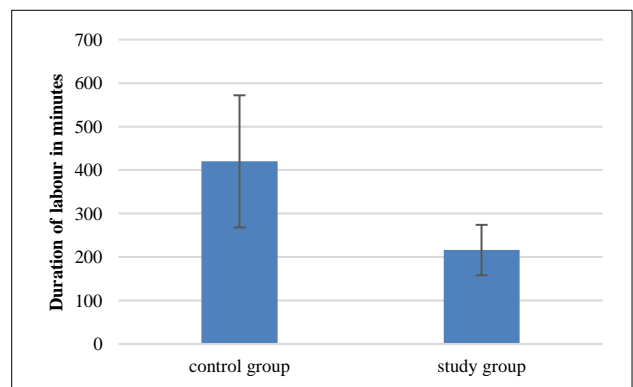


Figure3: Comparison of the mean total duration of labour in both the groups.

The mean duration of 2nd stage of labour in the study group is 34.95±12.98 minutes when compared to control

group which is 68.8±26.14 minutes which is significant (p-value->0.01).

The mean total duration of labour in study group is 420±152.78 minutes when compared to the control group which is 216.75±58.35 minutes which is significant (p-value->0.01).

Table 2: Comparison of mode of delivery in both the groups.

Mode of delivery	Control group n=100	Study group n=100	P-value
Vaginal delivery	78	88	.111
Instrumental delivery	18	10	.111
Caesarean delivery	4	2	.111

In the study group 88% had normal vaginal delivery whereas in the control group only 78%. Instrumental delivery in the present series 18% in the control group and 10% in the study group. The introduction of a policy of active management of labour has reduced to a certain extent the incidence of instrumental delivery. Since first stage is shortened by syntocinon drip, patients do not require much assistance in the 2nd stage of labour. Effective uterine contractions and good progress is maintained throughout labour. Caesarean section rate is more in control group.

Table 3: Comparison of mean quantity and duration of blood loss in 3rd stage in both the groups.

Parameter	Control group Mean ± SD	Study group Mean ± SD	P-Value
Amount of blood loss	211.6±79.52	143.6±52.2	.001
Duration of blood loss	7.6±2.83	4.6±1.68	.001

Amount and duration of blood loss is significantly less in study group when compared to control group.

Table 4: Comparison of the APGAR score at 5 min in both the groups.

Apgar score	Control group N=100	Study group N=100	P-Value
≥8	92	96	.136
≤7	8	4	.136

*In control group 8 babies had APGAR score ≤ 7 compared to only 4 babies in study group.

In the control group 3% mothers had puerperal morbidity. In the control group 10% babies had NICU admission whereas in the study group only 6% babies. In the control group 8% babies had fetal distress whereas in the study group only 4% babies. There were no still births or

neonatal deaths in the present series either in control or study group.

Table 5: Comparison of maternal and fetal complications in both the groups.

	Control group n=100	Study group n=100	P-Value
Puerperal morbidity	3	0	.385
Fetal distress	8	4	.326
NICU admissions	10	6	.326
Fetal wastage	0	0	

DISCUSSION

Labour is a physiological process and it brings a great joy and happiness to majority of families. The aim of successful labour management is to ensure the safe delivery of healthy baby to a healthy mother.

The age group in the present study is 19-30 years which is comparable with study of Mikki et al, Abdullah A et al.^{4,5} In other studies as Blanch et al, Sadler et al the mean age was considered.^{6,7} In a study by Sadler LC et al duration of first stage of labour is 290 (145-460) min in control group and 240 (120-390) min in study group which is comparable to the present study.⁷

When mode of delivery was observed it was seen that almost 78% of patients of control group and 88% of study group had vaginal delivery; 18% patients in control group and 10% in study group had instrumental delivery. The caesarean section was performed in 4% of patients in control group while 2% in study group, therefore, it is seen that there is no significant difference statistically. This matches with the result of Abdullah A et al.⁵

Duration and amount of blood loss is less in study group which is comparable to the study done by Sulochana.¹² Most of the authors has not observed any significant difference in the APGAR score. APGAR of the babies at 5 min showed that the oxytocin used had no adverse effects on the fetus.

In a study Akoury et al, there were no significant differences were detected in the occurrence of fetal complications between the control and study groups, which is comparable to the present study. 59 In a study by Sadler LC et al, there were no differences in maternal infectious morbidity or postpartum haemorrhage which is comparable to the present study.⁷

50 randomized controlled trials have found no difference in caesarean section rates, rate of operative vaginal delivery or neonatal outcome. It again supports our results with regards to operative delivery and neonatal outcome. Artificial rupture of membranes (amniotomy) to shorten labour has been widely practiced by obstetricians,

but some opponents have argued that it increases the risk of infection, cord prolapsed, abruption placenta, which in turn increases maternal and perinatal morbidity and mortality.¹³ In the developed countries many trials do not

recommend amniotomy to accelerate labour but in developing countries like ours the practice of amniotomy seems to be justified.

Table 6: Comparison of duration of stages of labour.

Authors	Stage of labour in minutes	
	Control group	Study group
Duration of 1st stage of labour in minutes		
Garite ⁸	457±233 (n=224)	347±206 (n=235)
Guerresi ⁹	209±141 (n=50)	212±97 (n=50)
Serman F ¹⁰	405±45 (n=40)	250±50 (n=50)
Sadler LC ⁷	290(145-460) (n=331)	240 (120-390) (n=320)
Present study	351.4±139.72	182±51.54
Duration of 2nd stage of labour in minutes		
Vergani P ¹¹	69.09±37.02 (n=16)	59.63±27.53 (n=16)
Sadler LC et al ⁷	60±35-100 (n=331)	59±33-106 (n=320)
Present study	68.8±26.14	34.95±12.98
3rd stage blood loss		
Sulochana ¹²	150-250	100-150
Present Study	130-290	90-195

In government hospitals there are many patients in the labour room with few doctors, nurses and midwives. This creates difficulty for paramedics to do proper monitoring of every patient for elongated period. In these circumstances, amniotomy serves many advantages e.g. It accelerates labour thus decreasing overall monitoring time. Also the colour of liquor gives idea about the foetal wellbeing, which helps in deciding the mode of delivery and making preparation for neonatal resuscitation.

The latent phase commences with maternal perception of regular contraction and in the presence of progressive, slow cervical dilatation ends at between 3-4 cm of dilatation which is the threshold for the active phase transition. At this point only active management of labour is to be started so that false labour cases can be excluded. Evidence presented in Blanch showed a statistically significant improvement in maternal satisfaction in those women randomised to amniotomy.⁶ Sulochana et al, was able to reduce this incidence of postpartum haemorrhage to 6% in cases electively induced with oxytocin drips by continuing the drip for 2-4 hours after delivery and reasons for the figure in our series being low may be due to continuing the drip for a few hours after delivery.¹²

CONCLUSION

In present study mean duration of 1st stage of labour is reduced in the study group with difference of 169 minutes. Mean duration of 2nd stage of labour is reduced in the study group with difference of 3-4 minutes. The mean total duration of labour is reduced in study group

with a difference of 204 minutes. Quantity and duration of blood loss is significantly less in study group when compared to control group. There was no significant difference in terms of mode of delivery, maternal and foetal outcome between the two groups. So, oxytocin infusion combined with amniotomy is safe and effective in accelerating the first and second stage of labour in apparently normal cases. No statistically significant adverse effects were noted with oxytocin infusion and amniotomy.

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