Original Article

Labour Analgesia and Its Outcome: In Rural Population

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ABSTRACT

Introduction: The purpose of the study was to assess the effect of programmed labour protocol on labour analgesia, duration of labour , maternal and foetal outcome and mode of delivery.

Methods: A prospective randomized study was done in UP Rural institute of Medical Science and Research, Saifai, Uttar Pradesh, India. One hundred and twenty primigravidae at 37 to 42 week gestation with vertex presentation and in the active phase of labour without any foetal or maternal complication were randomly allocated in two groups. 60 women received programmed labour protocol while other 60 women were managed expectantly with traditional method. Labour duration, pain relief, mode of delivery , maternal and foetal outcome noted in both groups were analyzed.

Results: Duration of all stages of labour were reduced($p<0.001$). Average blood loss was comparatively less in the study group. There was no foetal or maternal complications. 55% women in the study group had excellent pain relief. There was no impact on caesarean section rate.

Conclusions: Programmed labour protocol decreases the labour duration and provide significant pain relief without any maternal and/or foetal complications.

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Introduction

Labour is a physiological but painful event. The agony and stress a woman suffers during labour is beyond description, aggravated by anxiety , fear and ignorance. In a civilized society, freedom from pain is one of the basic rights of a person. Pain relief during labour reduces maternal stress, prevents maternal hyperventilation and undue muscular efforts and decrease exhaustion and thus improves maternal outcome. Labour analgesia, apart from reducing maternal distress , controls alterations of placental circulation and safeguards foetal hypoxia and depression at birth. Epidural analgesia has proved to be beneficial and has significantly contributed to pain relief with improved obstetric outcome[1,2]. However in developing countries like India , wherein majority of women are cared for in small hospitals with limited resources, facilities for providing epidural analgesia appears to be a distant dream . In such a scenario, programmed labour protocol appears to be a boon.

Programmed labour protocol was developed by Dr Daftary in India[3]. It is based on four pillars-

1. Oxytocics to ensure adequate uterine contractions.
2. Antispasmodics to facilitate cervical dilatation.
3. Analgesics to provide optimum pain relief
4. Partogram to assess the progress of labour

In our present study , we adopted this protocol with some modifications. Programmed labour protocol was compared with the traditional method in primigravida.

Methods

The present study was undertaken in the department of obstetrics and gynaecology in UP Rural Institute of Medical Science and Research, Saifai from January 2012 to January 2013. It was approved by the ethical committee of the institute. Nulliparous women between 37-42 weeks gestational age with vertex presentation and in active phase of labour with cervical dilatation of 3-4 cm and bishop's score >6 and admission Non Stress Test (NST) satisfactory were included in the study. None had clinical evidence of cephalo-pelvic disproportion or history of medical disorders like hypertension ,cardiac disease ,bronchial asthma, diabetes and jaundice. They were randomly allocated to two groups—a) study group and b)control group. The study group consisted of 60 women who received programmed labour protocol while the control group of 60 pregnant women were managed with traditional method.

In all women, general examination, systemic examination and obstetric examination including vaginal examination were performed. Informed consent for inclusion in the study was obtained.

In the study group, an amniotomy was performd to ensure presence of clear liquor and satisfactory heart rate pattern. A partogram was plotted alongside the " standard nomogram" and all labour events were charted on the partogram to guide the obstetrician in the management of patient. An intravenous infusion of Ringer's lactate was started. If the frequency of uterine contractions were not adequate, labour was augmented either with 25mcg tablet of misoprostol or 2 units of oxytocin in 500 ml of 5% glucose until atleast three contractions every 10 minutes lasting 35-45 seconds were established. Injection pentazocine 6 mg diluted in 10 ml of normal saline and injection diazepam 2 mg diluted in 10 ml of normal saline were injected slowly intravenously through separate syringes to initiate pain relief. The drugs were repeated every two hours if required. At the same time, injection tramadol 1mg/kg body weight was injected intramuscularly and injection drotaverine hydrochloride (antispasmodic) 40 mg injected intravenously. Injection drotaverine was repeated every 2 hours if required for a maximum of 3 doses. Pain score of the patient wasnoted as perceived by the women at the beginning of protocol. Visual Analog Scale(VAS) was used for the pain assessment. After delivery, 125ug carboprost tromethamine was injected intramuscularly. In the control group, diazepam, pentazocine ,tramadol,drotaverine and carboprost tromethamine were not used. Partographic monitoring of labour was done. The assessment was done as follows-

a) Duration of first, second and third stage of labour
b) Level of analgesia using following scale
   i. Score 0- no relief
   ii. Score 1- mild relief
   iii. Score2- moderate relief
   iv. Score 3- excellent relief
c) Mode of delivery
d) Amount of blood loss]
e) Maternal and foetal/neonatal complications
f) Side effects of the drugs used
g) Apgar score at 1 minute and 5 minute

Statistical analysis was done using z test. P value <0.05 was considered statistically significant.

Results

Both groups were comparable in age, gravidity and locality of residence. The mean age of women in the study group was 23.3 years while in the control group it was 22.6 years. Mean gestational age was 38.6 weeks in study group and 39 weeks in control group. The mean time of onset of analgesia was 18 minutes.

Partographic events in labour were analyzed. The mean duration of active phase of labour was 3.44±0.65 hours in the study group compared to 5.1 ±0.60hours in the control group. The mean duration of second and third stage of labour was 25.3 ±5.09minutes and 4.36 ±1.26minutes in the study group compared to 38.2 ±5.16minutes and 7.12±2.05 minutes respectively in the control group(Table I). All these differences were highly significant (p< 0.0001). The average blood loss was much reduced, 100 ml in the study group compared to 150 ml in the control group.

Majority of the patients delivered vaginally in both the groups(95% in study group and 88.33% in control group) (Table II).There was no statistically significant difference in both groups as regards the mode of delivery. Only two patients in the study group had caesarean section, the indication being non reassuring foetal heart rate in both. Mean apgar score was above seven in all cases in the study group except one baby who had heart rate <100 with respiratory depression; this baby was delivered by caesarean section for foetal distress. This was comparable to control group where Apgar score was less than seven in two babies; one baby delivered by forceps for deep transverse arrest and another baby delivered by caesarean section for foetal distress. However larger studies are required to assess the effect of drugs used in programmed labour on neonates. There was no neonatal mortality. We observed in this study that 55% women had excellent pain relief in labour, 41.67% had moderate pain relief while 3.33% women had mild pain relief. Pain relief score in the study group were highly significant(p<0.0001)(table III)

Frequency of drug related side effects were observed more in study group as compared to the control group(table IV.) Tachycardia was the most common side effect followed by nausea and vomiting in the study group. All these minor side effects subsided after 10-12 hours.

Table I. Duration of The Stages of Labour

	active phase of labour (hours)	2nd stage (minutes)	3rd stage (minutes)
Cases(n=60)	3.44±0.65	25.3±5.09	4.36±1.26
Controls(n=60)	5.1±0.60	38.2±5.16	7.12±2.05
Z value	14.353	13.786	8.88
p value	P<0.0001	P< 0.0001	P< 0.0001

Table II. Comparison of Mode of Delivery

Mode of delivery	Study group(n=60)	Control group (n=60)	Z value	P value
Normal delivery	57(95%)	53(88.33%)	1.13	p>0.05
forceps	1(1.66%)	2(3.33%)		
ventouse	0	1(1.66%)		
Caesarean section	2(3.33%)	5(8.33%)	1.175	p>0.05

p>0.05 is considered statistically not significant

Table III. pain Relief Score

Pain relief score	Study group (n=60)	Control group (n=60)	Z value	P value
3	33(55%)	0	8.56	P<0.0001
2	25(41.67%)	12(20%)	2.64	P=0.0083
1	2(3.33%)	37(61.67%)	8.72	P<0.0001
0	0	11(18.33%)	3.66	P=0.0003

P value <0.05 is considered statistically significant

Table IV. Side Effects and Complications

Maternal morbidity	Study group (n=60)	Control group (n=60)
tachycardia	6(10%)	7(11.67%)
Nausea	4(6.67%)	5(8.33%)
vomitting	4(6.67%)	3(5%)
diarrhoea	3(5%)	1(1.67%)
drowsiness	2(3.33%)	0
Cervical/ vaginal tears	2(3.33%)	1(1.67%)

Discussion

The experience of the study revealed that patients treated with 'Programmed labour protocol' had progressive, shorter and more comfortable labours with less blood loss.

In our study, mean duration of active phase of labour in primigravida was 3.44±0.65 hours(study group) and 5.1±0.60 hours(control). It was statistically significant($p< 0.0001$). Mean duration of second stage of labour was 25.3±5.09 minutes(study) and 38.2 ±5.16minutes(controls) which was statistically significant. Daftary et al[3] reported duration of active phase and second stage of labour in the study group as 3.5 hours and 26 minutes respectively. The mean duration of third stage of labour was 3.5 minutes. Chauhan et al[4] found duration of first stage of labour to be 3.4 hours in the study group as compared to 4.5 hours in control group. Mean duration of third stage of labour was 4.36 ±1.26 minutes(study group) and 7.12 ±2.05minutes(control group).

Excellent pain relief was observed in 55% cases and moderate pain relief in 41.67% cases in the study group. Prasertsawat et al[5] observed excellent pain relief in labour in 24-50% and Suvonnakote et al[6] in 40% cases. Veronica et al [7] reported total pain relief in 70% cases. Meena Jyoti et al[8] noticed that 54% achieved good and 32% achieved moderate pain relief. Daftary et al[3] reported excellent pain relief in 24% of cases. Chauhan et al[4] observed satisfactory pain relief in 88% primigravidae and 92% multigravidae in study group.

In our study , the mean time of onset of analgesia was 18 minutes while Husslein et al[9] reported that analgesic effect was observed after 10 minutes. Li and Weng [10] observed analgesic effect in 26.10 minutes. Chauhan et al[4] reported mean time of onset of analgesia around 16 minutes.

The average blood loss in the study group was 100 ml as compared to 135 ml reported by Reddy and Carey.[11] Daftary et al[3] reported average blood loss of 60 ml in cases. Chauhanet al[4] and Meena Jyoti et al[8] also had similar findings.

Programmed labour did not have any significant impact on caesarean section rates. Majority of the patients in both the groups delivered vaginally(95% in cases and 88.33% in controls). This was in accordance with the finding of Daftary [3],Veronica[7] and Jyoti et al. [8] There was no foetal or maternal mortality. Apgar score 1 minute and 5 minute was >7 in 98.33% cases and 96.66% controls. Daftary et al[3], Chauhanet al[4] and Jyoti M et al[8] also had similar observations. Bajaj et al [12] reported an Apgar score of >8 at 1 minute in all neonates of the tramadol group.

Minor side effects of the drugs were observed in our study. Suvonnakote et al[6] and Prasertsawat et al[3] reported minimal side effects in women receiving tramadol. Veronica et al[7] reported tachycardia (80%) as commonest side effect followed by nausea and vomiting(10%)

Conclusion

Programmed labour protocol' is a simple, inexpensive, easy and effective method for painless and safe delivery. The overall duration of labour is significantly reduced with marked labour analgesia . However there is no impact on caesarean section rate. Side effects of the drugs are minimal and safe for the foetus as well. This protocol is a boon in rural setting so that the childbirth becomes an event of joy and satisfaction for the mother.

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