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A Clinical Study of Programmed Labour and its Maternal and Fetal Outcome

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Abstract:

Programmed labor aims at reducing the duration of labor, labor pain and incidence of cesarean section with improved maternal and neonatal outcome. The aim of the present study was to evaluate the efficacy of providing obstetric analgesia by a regime, and to evaluate its effects on the mother, on the progress of labour, fetal outcome. The present study was a prospective evaluation conducted at our hospital from November 2007 to April 2009. Fifty uncomplicated primigravide at term (between 37-42 weeks) were included in the study and compared with 50 uncomplicated control group. 66% of patients had mild relief of pain, 24% of patients had moderate relief while 10% had no relief. In this study group maximum patients had mild to moderate relief of pain. In conclusion; Programmed labor significantly reduced duration of labor with good pain relief without compromising maternal and fetal/neonatal safety.

Key Words : Programmed labor, obstetric analgesia, Pain relief, maternal outcome.

INTRODUCTION:

Labour is defined as series of events that take place in the genital organs in an effort to expel the viable products of conception out of the womb through the vagina into the outer world. From the biblical times it has been accepted that pain of childbirth is part of the meaning of womanhood. However, over the years, with the progress of civilization, education, eradication of poverty, evolution of modernization and the assumption of a more positive role of women in today's society, woman are standing up to their rights and demanding the benefits of technological advances involving modern analgesic methods to be made widely available during child birth. It has been emphasized that pain during labour on the mother and fetus and form of analgesia should be offered to all parturient. The mother should rest quietly during labour with a successful program of analgesia and sedation.[1]

Obstetric analgesia achieved social and religious acceptance in the west, through Queen Victoria who received the first obstetric analgesia in the Royal family in 1853. Dr. Daftary et al developed the protocol of programmed labor in India[2]. 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 progress of labor. We adopted Dr. Daftary protocol with some modifications in the present study. Programmed labor protocol was compared with traditional management in primigravida.

The aim of the present study was to evaluate the efficacy of

Providing obstetric analgesia by a regime, administrating small bolus of the drug intravenously to provide adequate analgesia and to evaluate its effects on the mother, on the progress of labour, fetal outcome and finally to study the clinical effects produced by the drug when put to such use.

MATERIALS AND METHODS:

The present study was a prospective study done at our hospital from November 2007 to April 2009. Fifty uncomplicated primigravide at term (between 37-42 weeks) were included in the study and compared with 50 uncomplicated control group. The cases were selected at random from the women admitted in labour rooms for delivery.

Inclusion Criteria :

- Primigravidae at term (confirmed by dates & ultrasound) were selected for the study.
- The patient who were in active phase of labour.
- All age groups

Exclusion Criteria:

- Patients with pregnancy induced hypertension, cardio vascular disease or anemia [Hb<10gm%] & any other medical or obstetrical high –risk problem.
- Patients with a history of psychiatric disorder, drug allergy were also excluded from the study.

All the women had thorough general and systemic examination in labour rooms before including them in trail. Then the Obstetric examination was done in dorsal position. Per

vaginal examination was done with all precautions to note the following details like Effacement, Dilatation, Membranes intact or not and pelvic assessment was done and findings were noted in the proforma.

A partogram is initiated to document vital maternal paramenters baseline FHR, blood sent for group and cross-match, and just before administering analgesic drugs the patient's pain score recorded as follows:

Score 0 : no appreciation of pain.

Score 1 : appreciation of pain which is bearable ,patient does not desire any relief.

Score 2 : appreciation of pain which is severe enough for the patient to desire relief.

Score 3 : appreciation of pain severe enough for the patient to demand pain relief.

After providing analgesia after ½ hour, the pain relief score was documented as follows.

Score 0 : No relief of pain

Score 1 : Some relief of pain but to the desired extent.

Score 2 : Substantial relief of pain and

Score 3 : Complete relief of pain.

An I.V line started with 5% glucose infusion as 20 drops/min. 5 units of Syntocion added if the pains are not optimal. When labour progress is evident and the cervix more than 3 cm dilated and well effaced the membranes ruptured. Inject an ampoule of 'Drotin ' injected through the tubing set. Documenting the partogram commence. 2 ml of a previousy prepared, diluted solution of Pentazocine (Fortwin) and Diazepam (Calmpose) administered slowly intravenously through the I.V line. The solution is prepared as follows. (Draw 1ml of Fortwin i.e., - 30 mg and 2 ml of calmpose i.e. 10mg , into a 10 ml syringe, and dilute the same with distilled water to make up the volume to 10ml mix well) An injection of Tramadol, 50mg administred intramuscularly in the Gluteal region. Patient observed for next one hour. Evaluate the progress of labour on the partogram. Inj Drotin repeated every hour for maximum of 3 doses. IV Methergin slowly to the mother, when the crowning of the foetal head takes place, or soon after the baby is born.

Now the remaining 7.5ml solution of fortwin and calmpose added to a fresh infusion drip and allowed to run slowly as drops/min for the next 2 hour to four hours. This ensures rest. The patient is rechecked for any undue bleeding, check her vital parameters and observed for 1 hr and then transferred out of the labour room.

The mode of delivery and APGAR Score of the newborn at 1,& 5 minutes and the general condition of the mother is observed by pulse rate, following delivery were noted. Any maternal failure of secondary forces were assisted by application of outlet forceps. Any maternal side effects such as vomiting, nausea, drowsiness and hallucination etc were noted.

Neonatal evaluation was done on the basis of APGAR score at 1.5 and 10 minutes. At the end of labour, a summary was made to determine the

total does of during use and the duration of the stage of labour on partogram.

Evaluation Criteria:

The summary of events was recorded in the following manner.

1) Total duration of labour in Hours and minutes.
2) Total duration of the active phase of labour (3.0-10.0 cms cervical dilation) in Hours and minutes.
3) Rate of cervical dilation achieved.
4) Total duration of the second stage of labour.
5) Obstetrical intervention if any.
6) Total duration of the third stage of labour.
7) Assessment of blood loss as mild, moderate or severe .
8) Pain score at initiation of analgesia.
10) Pain Relief Score at the end of procedure.
11) Patient's attitude towards the procedure.

RESULT:

The age wise distribution of cases were shown in table -1.

TABLE-1

AGE (yrs)	NO. OF CASES		PERCENTAGE	
	STUDY	CONTROL	STUDY	CONTROL
18 – 20	37	30	74	60
21- 25	13	10	26	20
26- 30	0	10	0	20

The youngest patient was 16 years & oldest patient was 30 years. 100% of women were in the age group of 16-25 year Gestational age wise distribution of cases were shown in table-2

TABLE-2:

Gestational age in weeks	NO. OF CASES		PERCENTAGE	
	STUDY	CONTROL	STUDY	CONTROL
37 – 39	14	16	28	32
39 – 40	15	17	30	34
40 - 42	21	17	42	34

28% were in gestational age of 37-39 weeks compared to 32% in control group. 30% of study group were in 39-40 weeks compared to 34% in control group. 42% were in gestational age of 40-42 weeks compared to 34% in control group. 66% of patients had mild relief of pain, 24% of patients had moderate relief while 10% had no relief. In this study group maximum patients had mild to moderate relief of pain. analgesic efficiency & pain relief scores were shown in table-3

TABLE-3:

Pain relief Score	NO. OF CASES	PERCENTAGE
0(No pain relief)	5	10
1(Mild pain relief)	33	66
2(Moderate pain relief)	12	24
3(Complete pain relief)	0	0

In this present study group, maximum patients had cervical dilatation of 2.1 – 5 cms and minimum patients had cervical dilatation rate of 1 – 2 cms. We tested the significance of the difference between means of cases & control groups. Z value – 10.867, Tab Z value at 0.1% L.O.S(level of significance) – 3.33. P value < 0.001 – highly significant. In Veronica Irene Yuel et al study, the mean cervical dilatation was 2.3 – 2.8 cms.[3] In the study of S.N.Daftary et al, the mean cervical dilatation was 2.4-3 cms.[4]

Duration of active phase of labour were shown in table -4.

TABLE-4:

Duration in hrs	NO. OF CASES		PERCENTAGE	
	STUDY	CONTROL	STUDY	CONTROL
< 1	5	0	10	0
1 – 2.9	38	1	76	2
3 – 4.9	4	7	8	14
5 – 6.9	1	7	2	14
> 7	2	35	4	70

In this study maximum number of patients had mean duration of active phase for 1- 2.9 hrs. Minimum number of patients had duration of active phase for 5- 7 hrs. We tested the significance of the difference between means of study & control groups. Z value – 10.4989. Tab Z value at 0.1% L.O.S(level of significance) – 3.33. P value < 0.001 – highly significant. In Veronica Irene Yuel et al study, maximum number of women delivered within 2 hrs of entering the

active phase of labour.[3] This is almost equal to the present study.

In the study of S.N.Daftary et al, the mean duration of active stage was 90 - 100 mins.[4]

In this study maximum number of patients had less than 5 hrs (74%) total duration of labour. We Labour outcome was shown in table -5.

TABLE-5

Outcome	NO. OF CASES		PERCENTAGE	
	STUDY	CONTROL	STUDY	CONTROL
Normal	45	37	90	74
Forceps/Ventouse	5	11	10	22
Cesarean section	0	2	0	4

90% of patients delivered normally with episiotomy compared to 74% in control group. 10% had instrumental delivery due to failed maternal forces compared to 22% in control group. In this study no patient had cesarean compared to 4% in control group. In Veronica Irene Yuel et al study, 87% had normal vaginal delivery, 3% had instrumental delivery and 6% had cesarean section. In the study of S.N.Daftary et al, 84% had normal vaginal delivery, 10% had instrumental delivery & 6% had cesarean section

Among the fetal outcome, the apgar scoring wise distribution of cases were shown in table -6.

tested the significance of the difference between means of study & control groups. Z value – 9.1117. Tab Z value at 0.1% L.O.S(level of significance) – 3.33

P value < 0.001 – Highly Significant.

TABLE-6:

Time	Apgar score	NO. OF CASES		PERCENTAGE	
		STUDY	CONTROL	STUDY	CONTROL
1 min	4	2	1	4	2
	5 – 6	3	2	6	4
	7 – 8	42	39	84	78
	> 8	3	8	6	16
5 min	5 – 6	0	0	0	0
	7 – 8	2	11	4	22
	9 - 10	48	39	96	78

maximum number of neonates (84%) had Apgar Score 7-8 at 1 min. 96% had Apgar Score 9-10 at 5 mins. Few babies had delayed cry for 2-3 min which were resuscitated by pediatrician and were admitted in NICU for observation. Babies recovered excellently.

In this study 4% of babies were admitted in NICU in view of birth asphyxia treated with antibiotics and warmth care. There were no mortalities. There was o much difference between the study and control group. In Veronica Irene Yuel et al study, two babies had APGAR scores less than 7 at 1 min and 5 min. No apparent cause was found in these babies. In the study of S.N.Daftary et al, 1 baby had APGAR score of 3/7, & the babies recovered faster.

Programming Labour with sedatives, analgesics, oxytocics and antispasmodics were successful in mild to moderate relief of pain during labour and reducing duration of labour for which almost 96% of patients were satisfactory and also minimizing blood loss by active management of third stage of labour. 2 of them were unhappy due fetal morbidity.

DISCUSSION:

Labour and delivery cause pain in almost all patients and nulliparous women more likely to experience severe pain than multiparous women, hence this study was undertaken only in Primigravida for better evaluation of pain relief. In programmed labour, mixture of analgesics, oxytocics, and antispasmodics were used so as to meet the goals of providing complete pain relief, reducing the duration of labour, reducing blood loss and to provide a healthy baby. This includes Tramadol, Fortwin, Diazepam for analgesia and sedation, Drotaverine for rapid dilatation of cervix, Oxytocin and methergin for providing satisfactory uterine contractions before and after delivery. Fortwin and diazepam given in smaller doses i.e, 6 mg and 2 mg respectively which is a very minimal dose and less toxic to both mother and fetus.

Fifty cases of primigravida at term gestation in active phase of labour, having sufficient uterine contractions which were spontaneous or induced & with good fetal heart rate pattern were included in this study after taking informed consent. Patients without any medical complications were chosen. 50 similar cases as for study group were included in the control group to whom no analgesics or antispasmodics were given. Only 10% of patients had no relief of pain, 66% got mild relief but not upto desired extent. 60% had complete pain relief in second stage.

The results from the study of S.N.Daftary & Veronica Irene Yuel et al were about 70% of patients had complete pain relief. Meena Jyoti et al noticed that 54% achieved good and 32% achieved moderate pain relief.[5]

All stages of labour was reduced leading to reduction in total duration of painful labour. In this study maximum number of patients had less than 5 hrs (74%) .Dr. Chauhan et al found duration of first stage of labor to be 3.4 hours.[6] Mean duration of all phases of labour were shown in table-7.

Table 7:

Mean duration	**Study group (n= 50) Mean ±SD**	**Control group (n=50) Mean±SD**	**Z test (0.1% L.O.S)**	**P value**
Active phase of labour(Hours)	3.03±2.19	8.18±3.113	3.33	< 0.001
Second stage of labour (minutes)	22.24±14.18	50.26±13.122	3.33	< 0.001
Third stage of labour(minutes)	12.24±4.78	18.187±7.129	3.33	< 0.001
Total duration of labour(hours)	4.388±2.36	8.86±2.954	3.33	< 0.001
Rate of cervical dilatation in active phase(cm/hr)	4.81±1.961	1.58±0.901	3.33	< 0.001

The significance of difference was calculated statistically by Z value, Tab Z value at 0.1% level of significance being 3.33. P value < 0.001 which is highly significant for rate of cervical dilatation, duration of active phase & total duration of labour. P value < 0.001 is significant for duration of second stage & third stage. This was obtained by giving Drotaverine which causes cervical dilatation and oxytocin produces effective uterine contractions.[7,8]

Because of active management of third stage of labour, blood loss was mild in 84% of study group compared to 64% in control group. 12% had moderate blood loss and 4% had severe blood loss due to cervical and vaginal tears along with atonic PPH.

Effect on labour outcome in this study group are 90% patients had normal vaginal delivery, 10% required instrumental delivery due to failed maternal forces. None had cesarean section. While in control group 74% had normal vaginal delivery, 22% had instrumental delivery and 4% underwent cesarean section due to relative cephalopelvic disproportion. In the study of Veronica Irene Yuel et al, 84% had normal vaginal delivery, 10% had instrumental delivery & 6% had cesarean section.

Effects on Perinatal outcome in this study are 84% of babies born with APGAR score of 8 at 1 min. Only 2% had APGAR score 4 at 1 min. In these babies there was short delay in establishment of cry/respiration & then babies recovered with minimum stimulation in the form of drying with cloth, rubbing the back or flicking the sole. 96% had APGAR score 10 at 5 min. 4% of babies had APGAR 2/7 at 1 & 5 min. These babies were admitted in NICU in view of birth asphyxia.

Perinatal mortality were nil. There was no much difference in Perinatal morbidity between study & control group. In the studies by S.N.Daftary et al the APGAR scores at 1 & 5 min were satisfactory, & no Perinatal deaths.

CONCLUSION:

To conclude this study reveals excellent results with satisfactory pain relief, and rapid progress of labour which resulted in normal vaginal delivery with good neonatal outcome, with minor side effects and cost effective. This can be implemented by obstetrician themselves and needs no special apparatus. The patient acceptance is also good. Maternal Side effects were minimal and mild. Thus Programmed labour can be used as a safe and effective method of labour analgesia where there is also reduction in duration of labour.

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