International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2018): 7.426

Effective Labour Analgesia by "Programmed Labour"

Jasvir Kaur[1], Sunita Lamba[2], Simmy Chopra[3], Manish Chopra[4]

Abstract: ***Objectives: To evaluate the effective labour analgesia by programmed labour protocol and various effects on maternal and fetal outcome. Study Design: It is a prospective Study. Study Area: Department of Obstestrics & Gynaecology, Mata Chanan Devi Hospital, New Delhi, India. Material & Methods: 100 uncomplicated Primi Gravida in active phase of labour were selected and randomized into study and control group of 50 each study group received programmed labour protocol and the control group received conventional labour protocol. Rate of labour progressing, duration of labour, pain relief score, maternal and foetal outcome were studied. Results: The mean rate of cervical dilation was 2.9 ± 0.27 cm/hr, which was almost double of the control group. There was marked shortening of all the stage of labour. Average blood loss was comparatively less in the study group. 36% of women had excellant, 48% of women had moderate and 14% had mild pain relief. Majority of women in the study group delivered vaginally. No fetal and maternal complications or adverse effects were observed. Conclusion: The programmed labour is simple, easy and effective method for painless and safe delivery.***

Keywords: Programmed Labour, Partogram, Pain Relief Score, Labour Analgesia.

1. Introduction

Labour pain is considered as the most painful condition in a women's life. As reported on McGill pain questionnaire, labour pain is one of the most intense pain that a woman can experience and it is typically worse than a toothache, backache, and pain associated with a deep laceration. Pain is a noxious and unpleasant stimulus, which produces fear and anxiety.[1] Fear and anxiety exacerbate the pain of labour, but converse may also be true. Unrelieved stress in pregnant patients cause reduction in uterine blood flow, foetal heart rate and foetal oxygenation which cause catecholamine release and it leads to maternal hyperventilation causing respiratory alkalosis, leftward shift of the oxyhaemoglobin dissociation curve and increased maternal haemoglobin-oxygen affinity. Programmed labour is one such effort which rests on incorporation of the basic principles of active management of labour, synergistic application of analgesics and antispasmodics and plotting partogram to monitor events during labour, so as to detect dysfunctional labour and adopt timely intervention to optimize labour outcome.

Partography[2]: The partogram is a graphical representation of the changes that occur in labour, including cervical dilatation, foetal heart rate, maternal pulse, blood pressure, and temperature; it also shows a numerical record of features such as urine output and the volume and type of intervenous infusions (including oxytocin drips). The basis scientific study of progress of labour was developed by Friedman (1954) who described of graphically plotting the rate of cervial dilatation against time.

2. Materials and Methods

The present study was undertaken in the Department of Obstertrics and Gynaecology of Mata Chanan Devi Hospital, New Delhi from March 2017 to December 2018.

Subjects: 100 uncomplicated Primigravida in active phase of labour were enrolled in the study.

Inclusion Criteria

1) Primigravida between 37 to 40 weeks of gestational age with single live intra uterine gestation with vertex presentation at the onset of active phase of labour with cervical dilation 3-4 cm.
2) Availability of anaesthesiologist and neonatologist in the premises.

Exclusion Criteria

1) High risk pregnancy like–hypertension, diabetes, heart disease, severe anemia, previous LSCS, twins, malpresentation, jaundice.
2) Meconium staining of liquor.
3) Patient with psychiatric disorders in pregnancy.

In all women general examination, systemic examination and obstetric examination including vaginal examination were performed. Informed consent for inclusion in the study was obtained. The study was done in colloboration with a pediatrician.

In the study group, an amniotomy was performed to confirm clear liquor and satisfactory fetal heart pattern. In 15 women the uterine contractions were not adequate and hence labor was augmented with 2 units of oxytocin in 500 mL of 5% glucose drip at 20 drops/ minute i.e. 5mIU/minute which dose was gradually increased until at least 3 contractions every 10 minutes lasting for 35-45 seconds were established. A low dose sedative and analgesic consisting of 2 mg of diazepam and 6 mg of pentazocine was administered after diluting 1 ampule of each with 7 mL of normal saline and injecting 2 mL slowly intravenously. At the same time injection tramadol 1 mg/kg body weight was injected intramuscularly and injection drotaverine hydrochloride (antispasmodic) 40 mg injected intravenously. Drotaverine was repeated 2 hourly. After delivery 10unit oxytocin was injected intramuscularly for active management of the third stage of labor.

Labor was monitored by using a partogram. The time of onset of analgesia was recorded. The pain relief score was noted on a Visual Analogue Scale (VAS) of 0 to 10 (0- 2=

excellant pain relief, 3-5= moderate pain relief, 6-8= mild relief, 9-10=no pain relief). Duration of the three stages of labor, amount of blood loss and mode of delivery were noted. Apgar score of every new born was noted at 1 and 5 minutes. VAS will be calculated according to the scale below.

Visual Analogue Scale

(No Pain) (Worst imaginable pain)
0_____10

Correlation of VAS with Pain Relief Score

VAS	Pain Relief Score	
0-2	Excellent Relief	3
3-5	Moderate Relief	2
6-8	Mild Relief	1
9-10	No Relief	0

TOTPAR (Total pain relief score) will be calculated by the under-mentioned formula:

TOTPAR= VAS after Delivery × Injection Delivery Interval (in hrs)

The Outcome of the study recorded as follows:

- Duration of each stage of labour
- Pain relief score
- Mode of delivery
- Maternal complication
- APGAR score

3. Results

Both the groups were compare able in age, parity and Gestational maturity partographic quests in labour were analyzed.

Table 1: Comparison of Partographic Events

Parameters	Study groups	Control groups
Duration of first stage of labour(MD±SD)	3.03±1.55hr.	4.90±2.36hr.
Duration of second stage of labour(MD±SD)	18.26±13.3min.	35.28±17.9min.
Duration of third stage of labour(MD±SD)	3.03±1.27min.	6.16±2.91min.
Rate of cervical dilatation(MD±SD)	2.9±0.27cm/hr	1.7±0.44cm/hr
Average blood loss(MD±SD)	122±31.49ml	245.80±47.50ml

In study group there was a marked reduction of the active phase of labour. The mean duration of cervical dilatation was nearly double (2.9 cm/hr) than the control group (1.7 cm/hr) resulting in shortening of the duration of both first as well as second stage in the study group. This observation was found to be statistically significant. (P<0.0001)

It was also observed that there was significant reduction in the duration of third stage, which was due to early separation of the placenta in the study group 3.03 + 1.27 minutes. Average blood loss was much reduced 122.00 ± 31.49 ml in the study group compared to 245.80 ± 47.50 ml in the control group which is statistically significant (P value <0.0001)

Table 2: Pain Relief Score in the Study Group

Pain relief score	Percentage
Excellent pain relief	36%
Moderate pain relief	48%
Mild pain relief	14%
No pain relief	2%

In the study there was 36% of women has total pain relief, 48% of women has moderate and 14% has mild pain relief. Only 25 of women had no pain relief.

Table 3: Comparision of VAS between study and control groups

	Study group (MD±SD)	Control group (MD±SD)
VAS score before analgesia	6.44±2.07	5.86±2.12
VAS score after 1 hr. of analgesia	3.70±1.96	7.26±1.34
VAS score after delivery	4.36±2.04	7.12±1.44
TOPAR	10.39±7.65	30.62±19.38

In study group VAS score after 1 hr. of analgesia was 3.70±1.96 as compared to control was 7.26±1.34.

Table 4: Mode of Delivery

Mode of delivery	Study group	Control group
Normal vaginal delivery	42(84%)	37(74%)
Forceps delivery	0(0%)	2(4%)
Vacuum delivery	3(6%)	3(6%)
LSCS	5(10%)	8(16%)

Only five patients in the study group had caesarean section, the indication being relative cephalopelvic disproportion in 2 and foetal distress in another.

Table 5: Side effect in mother

Side Effects	Study group	Control group
Nausea	8%	1%
Vomiting	6%	3%
Giddiness	2%	0%
Diarrhea	4%	0%

None of the patients had life threatening complications in both the groups, most of them had nausea and vomiting (8% and 6%) one patient in control group had mild PPH, which was controlled with oxytocics. Giddiness (2%) and dianhoea (4%) are also answered in study group.

Table 6: APGAR Score

Time	APGAR SCORE	Study group	Control group
At 1 min.	<7	4%	2%
At 1 min.	>7	96%	98%
At 5 min.	<7	0%	2%
At 5 min.	>7	100%	98%

Two babies born to the women in the study group had apgar score of less than seven at one minutes but more then 7 at five minutes.

4. Discussion

At the turn of millennium a change of attitude from 'No pain no gain' to 'Pain relief is basic human right' is the cornerstone of our success. Implementation of programmed labour protocol effectively reduces the duration of all stages of labour. Concept programed labour has been introduced by Dr. Daftary in 1992 Programmed labour protocol[3] incorporates three basic principles:

1) Active management of labour
2) LabourAnalgesia
3) Plotting the partography

In the present study the mean duration of **first stage** in the control group was 4.90±2.36 hr. which was reduced to 3.03±1.55 hr in the cases**. The First stage of labour was reduced by 1.77±0.29 hr.** The difference being statistically highly significant.

The second stage of labour was reduced by 17.02±4.55 min. and **third stage was reduced by 2.78±1.64 min.** in cases. **Total duration of labour** was reduced by 133.45±49.7 min. and IDI(Injection deliveri interval) was reduced by 1.91±0.86 hr. In cases, hence **cervical dilatation was 1.20±1.10 cm/hr**. faster in cases as compared to controls. All these factors were statistically highly significant.

36% patients had excellent pain relief. 48% patients had moderate pain relief score. Only 1 patient had no pain relief. 44 patients have some kind of pain relief. Results are highly significant statistically (VAS before analgesia in both cases and controls was not statistically significant). After analgesia i.e. 1 hour after pain relief injections were given; statistically the difference in cases and controls was highly significant. In cases pain score was decreased after 1 hour but in controls it increased. VAS dropped from 6.44 ± 2.07 to 3.70 ± 1.96 in cases and in controls it increased from 5.86 ± 2.12 to 7.26 ± 1.34. In controls pain score remained almost same during labour and post delivery. This result hence shows that when the duration of labour is less total pain score is less.

Pain relief in our study is 36% excellent pain relief, 48% good pain relief, 14% mild pain relief and 2% no pain relief as compared to the study in **Anjuman Alam et al[4],** 25% had good pain relief, 60% had moderate pain relief, 15% had mild pain relief and 0% had no relief of pain. This study shows better pain relief**. K.Gupta *et al*[5],** 46% of women had excellent pain relief, 40% of women had mild to moderate pain relief. **Ahmed F.Shaikh et al[6],** 66.9% of women had good pain relief 19.8% of women had moderate pain relief. Only 13.3% of women had mild pain relief. **Nitin S. Kshirsagar, et al[7],** 73% had good pain relief. **Shahida Mir et al[8],** 85% women had significant pain relief**. Manoj A.et al [9]** 70% of the study group had excellent pain relief.

5. Conclusion

Programmed labour is an easy and effective way to achieve labour analgesia, shortens the duration of all the stages of labour without any adverse effects on maternal and neonatal outcome. Analgesia is quite effective and the side effects of drugs are minor and safe for the fetus as well. The ease of administration (It does not require other trained persons like anesthetist and can be administered easily by the obstetrician themselves), the need for minimal patient monitoring with systemic analgesia made programmed labour protocol highly acceptable. Since the blood loss in third stage is much lowered, programmed labour can be used in anaemic patients as well.

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