Research Article

Evaluation of effectiveness of labour analgesics in programmed labour

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Abstract

Background: Management of labour is an art and science and many a times achallenge in the present scenario with the advent of many modifications in labour science and the increasing demand of the clients for a safe and not so painful experience. "Programmed labour is an indigenously developed protocol for labour management developed with dual objective of providing pain relief during labour and reaching the goals of safe motherhood by optimizing obstetric outcome"[1.] I this direction the current study was undertaken to examine the effectiveness of analgesics used in the management of Programmed labour. **Objectives**: To study the efficacy of Obstetric analgesics in programmed labour. **Materials and Methods:** This prospective study includes two hundred women in active phase of labour who underwent management of labour by programmed labour protocol assessed for effectiveness of labour analgesia. Two patients went for caesarean section in the beginning itself due to non-reassring Foetal status. Labour pain scoring was done when the patient was set into active labour in three distinct groups. Then the analgesic medication was administered as per the protocol in programmed labour. The postmedication pain relief scoring was done. Efficacy of the analgesic in relation to the cervical dilatation and duration of labour was examined and analysed statistically. **Results**: Of the 198, parturients 2 patients had bearable pain (pain score 1), 177 had severe pain (score 2) and 21 had unbearable pain (score3).Of the group with unbearable pain (score 3) 12 (57.2%) had complete pain relief. Out of 135 patient who had cervical dilatation of 3-4 cms, 75% had substantial relief of pain. Those who had 1-2 hrs of active labour, 73% had substantial pain relief after medication. **Conclusions:** Programmed labour protocol proved to be efficient in pain relief, shorter duration of labour, reduction in incidence of dystocia, reduction in instrumental deliveries and caesarean sections with a good maternal and neonatal outcome in both primi and multigravidae.

Keywords: ketamine, amniotomy, pain score, Active management of labour, Pain relief score.

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INTRODUCTION

The management of labour has undergone so many changes as our understanding of the physiology of labour, specially the madications used to alleviate pain during labour. **Programmed labour** is an indigenously developed protocol for labour management developed with dual objective of providing pain relief during labour and reaching the goals of safe motherhood by optimizing obstetric outcome[1.] The concept of active management of labour was first implemented by O' Driscoll and colleagues at the National Maternity Hospital in Dublin in 1968.

Programmed labour concept

The protocol developed by Daftary *et al* (1992) over a period of many years rests on three pillars of

1. Ensuring adequate uterine contractions – Active management of labour.
2. Providing optimum pain relief – Use of analgesics and antispasmodics.
3. Close clinical monitoring of labour events – Maintaining a PARTOGRAM.

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This management system contains obstetricians supervising normal spontaneous labour in nulliparous women and intervening only when labour progress was slow. The protocol of optimizing labour includes principles incorporating - Active management of labour, providing optimum pain relief with a combination of analgesics and antispasmodics, charting labour events on an indigenously prepared partogram. As an important pain relief medication, ketamine induces theta activity, and its appearance coincides with onset of analgesia. However, analgesia do not persist as long as theta activity lasted. Chen and coworkers studied the neuropharmacological properties of ketamine as compared to phencyclidine. They have shown that phencyclidine produces convulsions, whereas ketamine does not.[2] O'Driscoll *et al* showed that average duration of stage 13.5 hours in the study as compared to 5.2 hours in the control groups with routine amniotomy in active phase of labour Cohill DJ, *et al* in their retrospective study, showed that there was no increased frequency of asphyxial perinatal death, neonatal seizures, or abnormal neurologic behavior in infants of women who received high-dose oxytocin in labor.[3]

MATERIALS AND METHODS

The source of data for this study were patients from three hospitals attached to J.J.M Medical College Davanagere..
Method of collection of data; subjected admitted to labour room for delivery were selected continuously.

Inclusion Criteria

- Pregnant women aged between 18-35 years
- Primigravida with term gestation (confirmed by dates and / sonography) With Singleton pregnancy .
- Cephalic presentation
- Pregnant woman enters the study when in active phase of labour (Cervical dilatation 3 cm - Effacement 70% or more)
- Good uterine contractions.
- Well engaged head.

Exclusion Criteria

- Subjects with non vertex presentation.
- Those with multiple gestation.
- Those with antemetal obstetric complications.

All multigravidae This was a Prospective study, with sample size of 200 pregnant women (period of study 2010 to2012). The Pain score was scaled down as in table 1.In the programmed labour procedure, an IV line with Ringer lactate drip would be started with drip rate of 20 drops / min. Two units of Oxytocin added to the drip if uterine contractions are not adequate. Six mg of Pentazocine diluted in 10ml normal saline and 2mg of diazepam diluted in 10ml saline is administered IV..Next Inj. Tramadol 1mg/kg body weight given IM followed by inj. Hyoscine butylbromide 20 mg given IM. At cervical dialation of 7 cms, inj. Ketamine, 0.5mg/kg body weight diluted in 10 ml saline is administered IV slowly. Top up dose of ketamine (which is half of the initial dose which is 0.25mg /kg) given 30 minutes after first dose given.. Last top up dose (which is again half of initial dose) is given after the birth of the baby. Inj. Carboprost tromethamine 125mg given IM after birth of baby.

RESULTS

In this study 200 women in labour were considered for labour analgesia, .of which 2 had non assuring foetal condition and went for section. Thorough examination was done to check that the patient was in active labour (cervical dilatation of atleast 3-4cm) all the patients managed on the line of programmed labour protocol. The premedication pain scoring and post medication pain relief scoring were assessed and compared.

Table 1: Premedication pain score and the subjects in labour

Pain score	No of cases	% age
0 – no pain	--	--
1- Bearable pain	2	1
2- severe pain	177	88.5
3- Unbearablae pain	21	10.5
Total	**200**	**100**

Table 2: pain relief scores are measured and reassessed after every half an hour to 1 hour

Pain relief Score	No relief of pain	No of cases	%age
1	Pain relief present, but not to the desired extent.	14	7
2	Substantial relief of pain.	150	75
3	Complete relief of pain.	34	17
4	LSCS	2	1

The table shows that majority (75%) of patients had substantial pain relief.

Table 3: Overall comparision of pre and post medication pain scores

Premedication pain scores	No of cases	Postmadication pain relief scores		
		1	2 Substantial relief	3 Complete relief
1 Bearable pain	2	0	2(100%)	0
2 Severe pain	175	14(8.0%)	139(79.4%)	22(12.6%)
3 Unbearable pain	21	0	9(42.8%)	12(57.2%)
Total	**198**	**14**	**150**	**34**

χ^2 =27.35, p<0.01 significant

In the study, 79% of patients who had severe pain (pain score 2) achieved substantial pain relief.

Table 4: Postmedication pain relief score in relation to a) dilatation of the cervix and b) duration of labour

Pain relief in relation to		No of cases (n)	Pain relief score			χ2	P
			1	2	3		
a) Dilation of cervix	3-4cm	135	12(8.9)	102(75.5)	21(15.6)	2.63	0.25,NS
	5-6cm	63	2(3.2)	48(76.2)	13(20.6)		
	Total	**198**	**14**	**150**	**34**		
b) Duration of labour	1_2 hrs	80	4(5.0)	59(73.8)	17(21.2)	31.28	<0.05.S
	3_4 hrs	99	3(3.0)	79(80.0)	17(17.0)		
	5_6 hrs	19	7(36.8)	12(63.2)			
	Total	**198***	**14**	**150**	**34**		

Chi- square test, * - 2 cases with LSCS excluded

Pain relief scores

1. Pain relief present, but not to the desired extent.
2. Substantial relief of pain.
3. Complete relief of pain.

DISCUSSION

This was an attempt to study the efficacy of various medication in relation to the duration of labour, the pain relief and the maternal and foetal outcome. The programmed labour amply reduced the anxiety level of women and her family there by giving the whole process a happy ending as she is comfortable in the process of otherwise **intolerable** experience. In this study, the total numbers of 200 pregnant women in labour were taken. Two of them went for caesarean section for non reassuring foetal status. All (198) of them entered the study in active phase of labour. Majority of the cases in this study included those with 4 cm dilatation followed by 5 cm, and a very few had dilatation above 6 cm. duration of labour is shown in table 4. In the study, 79% of patients who had severe pain (pain score 2) achieved substantial pain relief. Out of 21 (10%) patients who hadunbearable pain, 42% had substantial pain relief and 58% had comple pain relief. This shows more than half of the patient had complete relief of pain in the severe pain group, making medication (Ketamine) to play a major role in labour analgesia. We did not find any foetel or maternal side effects in the dose used. Dr. Kanan A. Yelikar, observed few maternal side effects like nausea, vomiting, tachycardia, though no major side effects were observed.. In the present study also, there is ample shortening of duration of labour, adequate pain relief with little maternal side effects like nausea vomiting and headache and very negligible perinatal morbidity. Akamatsu TJ[4] and coworkers (1974) used ketamine as the sole anaesthetic agent. This resulted in no significant maternal or neonatal complications. In 1992, Putal Sarkar and Sahu SP[5] used Ketamine in a continuous infusion of 0.5 to 1 mg / minute ketamine administration, resulted in no significant maternal and neonatal complications and was acceptable to most women in labour. The dose schedules used in our study was similar to those used by Leena and Hafeez. Instead of a continuous infusion of ketamine, our study used a dose of 0.5mg/kg of ketamine followed by top up doses which amounted to half of the initial dose.[6] In the study, all patient's were in active labour with a minimum cervical dilatation of 3cm. These 198 cases were divided into 2 group. 1 group with 3-4 cm and II group with 5-6 cm. In the I group and II group almost 75% had substantial pain relief. 17% had complete pain relief. while almost 7% did not have pain relief to desired extent. We found no significant difference in the pain relief pattern in relation to the cervical dilatation. This may be due to the medication given in the early phase of active labour. Amniotomy seems to accelerate the labour as we noticed significant reduction in the duration of labour along with pain relief. A Cochrane[7] review from 2002 analysed the policy of early amniotomy seemed to reduce labour duration from between 60 to 120 minutes. There was a statistically significant reduction of 54 minutes for total length of labour. In the present study, amniotomy was done after good effacement of cervix. This helped in shortening the duration of labour which in turn helped in a better pain relief for the parturient. Satin

et al[8] used a high dose regimen of oxytocin at national maternity hospital found that labour was reduced by 3 hrs and there were lesser caesarean sections done for dystocia, when compared to a standard low dose protocol. Similarly in this study caesareans and instrument deliveries were considerably reduced and there were no significant perinatal loss. Fetal outcome was good as Apgar scores at the 1st and 5th minute of life of the baby was good. Only six cases had non reassuring fetal rate status, out of which 4 were delivered by instrumental delivery and 2 were taken for Caesarean section. Both maternal and fetal outcomes following programmed labour were good. Our study has shown significant relation between premedication score and postmedication pain relief. Out of 198 cases. 2 cases had minimal pain, 89 seeked pain relief, 9 had unbearable pain. Of the 9 cases who had unbearable pain 55.6% had complete pain relief and 44.4% had substantial pain relief. Of the 89 cases who had pain severe enough to seek relief 78.7% had substantial pain relief 13.5% had complete pain relief, while 7.9% did not have desired pain relief. The ones with mild pain had substantial pain relief which shows ketamine as a good analgesic agent and can keep patient comfortable. There was no significant pain relief in relation to cervical dilatation $p = 0.05$. How ever there was significant improvement in pain relief scoring when compared to premedication score. This tells us the need for medication irrespective of cervical dilatation once the lady is in active labour. There was significant relief in relation to duration of labour. $P < 0.05$. Majority had vaginal deliveries with very few instrumental deliveries and very low caesarean rates indication being fetal distress, maternal morbidity was minimal and more than 80% had substantial pain relief. Perinatal outcome was good with no neonatal morbidity or mortality.[9] The reduction in caesarean delivery rate became the focus of the active management of labour when the National Maternity Hospital noted low rate of cesareans for dystocia when compared with stateside medical centers. The difference, however, in caesarean delivery rates could be attributed to differing labour protocols at the time and the lack of an organizational components to labor management. Nevertheless, in recent years the rate of caesarean delivery for dystocia in Dublin has risen from 1.4% to 5%.[10] However we did not find any increase in the rate of either caesarean sections nor instrumental procedures in our study.

CONCLUSIONS

After the observations made in the study we came to the following conclusions;

- Programmed labour can be used in any age group.
- This method is effective once the patient is in active labour,
- Labouring women with moderate to severe pain had a better pain relief.
- It helps in shortening the duration of labour.
- Lesser the duration of labour better was the pain relief.

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