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Corresponding Author
S. Mamatha,
Department of OBG, KODAGU Institute of Medical Sciences, Madikeri, Karnataka, India

Author Designation
[1,3]Assistant Professorr
[2]Post Graduate
[4]Head of the Department

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Intrapartum Usage of Intravenous Paracetamol and it's Fetomaternal Outcome

[1]S. Mamatha, [2]M.R. Ashwini, [3]M. Ananda and [4]H.K. Somashekar

[1,2,4]Department of OBG, KODAGU Institute of Medical Sciences, Madikeri, Karnataka, India
[3]Department of Radiology, KODAGU Institute of Medical Sciences, Karnataka, India

Abstract
An ideal labour analgesia should give effective pain relief, minimal effect on labour progress and outcome of labour, safe, minimal side effects on both mother and fetus. Paracetamol is commonly used over the counter available analgesic in all age groups and also as an labour analgesic agent, it is affordable, simple to use and have minimal side effects and no need of extra supervision or monitoring. The present study conducted in the department of Obstetrics and Gynaecology of Kodagu institute of medical science, Madikeri during the period from 1st June 2023 to 15th October 2023. It was a randomized clinical trials where 70 pregnant women induced after informed consent. In the study group (Group A)32 women had spontaneous vaginal delivery, 2 underwent caesarean section 1.4% (1 women) had instrumental delivery. In control Group 22 women (31.4%) had normal delivery, 8 women underwent caesarean delivery and 5 had instrumental delivery.

INTRODUCTION

Labor is a significant and transformation event in a women's life making the cumulation of pregnancy and the beginning of motherhood. Labour pain is associated with frequent, painful uterine contractions with gradual cervical dilatation and effacement are hallmark of labour[1].

In contrast to other types of pain, labour pain is linked to the most fundamental and basic experience of existence: The birth of a new life. Instead of being associated with pathology. (2)It is a complex physiological process influenced by variety of factors including cultural, environmental, social and psychological aspects[2]. Perception of pain is highly individual.

Most women experience excruciating agony during childbirth and this impacts maternal psychology, labour progress and fetal well-being with prolonged delivery and intense pain being key factors in encouraging cesarean birth[3,4]. So effective labour pain management is important and hence here comes the role of adequate labour analgesia. There are various pharmacological and non-pharmacological methods of labour analgesia[5].

An ideal labour analgesia should give effective pain relief, minimal effect on labour progress and outcome of labour, safe, minimal side effects on both mother and fetus[6]. Paracetamol is commonly used over the counter available analgesic in all age groups and also as an labour analgesic agent, it is affordable, simple to use and have minimal side effects and no need of extra supervision or monitoring[7]. In view of the above concepts this study will throw some light to the role of paracetamol as a labor analgesia, its effects on progression of labor and fetomaternal outcome.

MATERIALS AND METHODS

The present study conducted in the department of Obstetrics and Gynaecology of Kodagu institute of medical science, Madikeri during the period from 1st June 2023-15thOctober 2023. It was a randomized clinical trials where 70 pregnant women induced after informed consent.

Inclusion criteria:

- Pregnant women in the age group of 18 -35years.
- Term gestation (37-42 weeks).
- Cervical dilatation 3-4cm with spontaneous onset of labor.
- Singleton with cephalic presentation.
- No use of prior analgesia.
- Pregnancy without any high risk factors.

Exclusion criteria:

- Hypersensitivity to paracetamol.
- Fetal distress or Fetal growth restriction.
- Previous cesarean section.
- Intrauterine fetal demise.
- Anomalous fetus.
- Preeclampsia with HELLP syndrome, uncontrolled diabetes mellitus, abruptio placentae, placenta previa(APH).
- Malpresentation.
- Multiple pregnancy.
- Patient who refused to participate in the study.

The Pregnant Women were Randomly Divided into two Groups:

- **Group A:** Includes 35 pregnant women were spontaneously progressed to 3-4 cm dilatation and admitted to labor room and were received 1g paracetamol infusion over 15 minutes.
- **Group B:** Includes 35 pregnant women, allowed for normal vaginal delivery and not received any analgesia.

Pain Intensity Assessment Done Before and After Administering Paracetamol by VAS Score (visual Analogue Scale)

- 0:No pain.
- 1-3:Mild.
- 4-6: Moderate-severe.
- 7-9:Very severe.
- 10:Worst.
- Vitals were monitored before and after 1hour of paracetamol administration. Progression of labour was assessed using partograph.
- The study also recorded the duration of labour, mode of delivery, drug-delivery interval and neonatal outcome.

RESULTS AND DISCUSSIONS

In the present study 70 antenatal women were enrolled who were divided into 2 groups. Epi-info version 7.2 software is used for analysis.

Demographic Statistics: The age group in the present study ranged from 18-35 years in the birth groups. Mean age was 24.834+/-in the study group (Group A),24.837+/-4.382 in the control group (Group B).

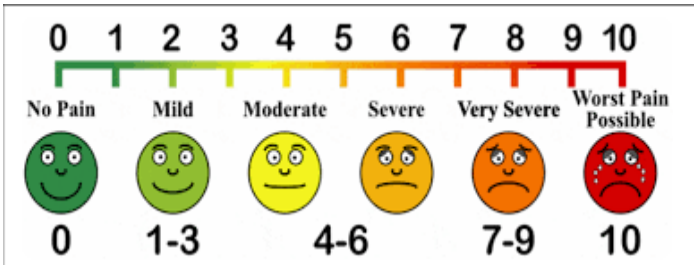

Fig. 1: Pain Intensity Assessment

Table

1: Age wise distribution of study and control group

Age group	Study group		Control group		p-value
In years	Frequency	Percentage	Frequency	Percentage	0.349
<=20	7	63.6%	4	36.4%	
21-30	26	50%	26	50%	
>31	2	28.6%	5	71.4%	
Total	35		35		
Mean age	24.43+/-3.920		24.83+/-4.382		

Table 2: Distribution of the study and control groups according to gravidity

	Study group		Control group		p-value
	Frequency	Percentage	Frequency	Percentage	
Primigravida	24	55.8%	19	44.2%	p=0.220
Multigravida	11	40.7%	16	59.3%	

Table 3: Distribution of females of study and control group based on gestational age

	Study group	Control group	p-value
Mean	38.8	38.8	0.889
SD	1.04	1.01	

Table 4: Comparison of VAS score before paracetamol infusion

VAS score before	Study	Control group	p-value
<6	1	4	0.167
>7	34	31	
Mean	8.06	8.26	
SD	1.027	1.268	
Range	4	4	

Table 5: Comparison of VAS score in the study and control groups after 1 hour of paracetamol infusion

VAS score after 1 hour	Study group	Control group	p-value
< 6	28	0	0.0001
>7	7	35	
Mean	5.83	8.74	
SD	0.857	0.98	
Range	4	4	

Table 6: Comparison of drug-delivery interval between study and control group

	Study group	Control group	p-value
Mean	6.86	9.65	0.041
SD	5.31	7.16	

Table 7: Comparison of Mode of delivery between study and control groups

Mode of delivery	Study group		Control group	
	Frequency	Percentage	Frequency	Percentage
Full term vaginal delivery	32	45.7%	22	31.4%
Cesarean delivery	2	2.9%	8	11.4%
Vaccum assisted vaginal delivery	1	1.4%	5	7.1%

Table 8: Comparison of APGAR score in the study and control group at 1 minute

APGAR Score (1 minutes)	Control	Study	p-value
7	2	3	0.893
8	13	13	
9	20	19	

Table 9: Comparison of APGAR score in the study and control group at 5 minute

APGAR Score (5minutes)	Control	Study	p-value
8	0	0	0.303
9	22	26	
10	30	9	

Parameters	Karim et al.	DrJaspal Kaur et al.	LallarMeenakshiet al.	Neha Garg, Vanitha VG	JeetinderKaur Makkaret al.	Present study
Study subjects	120	100	200 273	60	70	
Age group (Years)	18-35	18-40	20-35 18-35	18-35	18-35	
Gestational age (Weeks)	37-42		Full term Term (>37w)	Term	Term (37-42w)	
Obstetric score	Primigravida	Bothprimi-gravida and multi-gravida (p=0.548)	Primi-gravida	Primi-gravida and multi-gravida	Primi-gravida	Both primi-gravida
Parameters	**Karim et al.**	**DrJaspal Kaur et al.**	**LallarMeenakshiet al.**	**Neha Garg, Vanitha VG**	**Jeetinder Kaur Makkaret al.**	**Present study**
VAS score	Lower VAS score after 15 min and 30min after paracetamol administration	Significant drop in VAS score after 30min (p<0.001) &60min (p<0.001) after PCT infusion	Mc Gills pain intensity scale used. After 1hr and 3hr of PCT drug administration difference in pain perception in 2 groups were statistically significant. (0.000)	VAS score significantly decreased in 1hr and 3hr after paracetamol administration (<0.001)	No statistically significant in both groups.	VAS score significantly decreased after 1hr after paracetamol administration (<0.0001)
Mode of delivery	Not affected (0.564)		No significance (p=0.001)	Not statistically significant		Less number of cesarean deliveries in study group compared to control group
Parameters	**Karim et al.**	**DrJaspal Kaur et al.**	**LallarMeenakshiet al.**	**Neha Garg, Vanitha VG**	**Jeetinder Kaur Makkar et al.**	**Present study**
Drug delivery interval	Not affected in both groups (p=0.558)		Decreased in paracetamol group compared to tramadol group (p=0.001)	Decreased in paracetamol group compared to tramadol group (<0.0001)		Decreased in paracetamol group(0.041) compared to control group.
Duration of labour		Reduction in duration of 1st& 2ndstage of labour after paracetamol administration (<0.001)	Reduction in duration of 1st, 2nd& 3rdstage of labour in paracetamol group than tramadol group(p=0.000)	Reduction in duration of 1st(<0.0001), 2nd(0.0041) stage of labour was statistically significant.	Duration of 1ststage of labour was shorter in PCT group compared to tramadol group.	
APGAR score 5min	Not affected	No fetal side effects	Not affected	Not affected (p=0.636, 0.204)	No significance(p=1)	No significance (at 1min &
Maternal	No significance	No significance	No significance	No significance	Nil side effects in PCT groups complications	No side effects

There was no statistically significant difference of age distribution in the birth group (P = 0.349).

55.8% of pregnant women (24 female) of study group(Group A) and 44.2% of control Group (Group B) were primigravida, while 40.7% (11 female) of pregnant women of study group and 59.3% (16 female)of control group were multigravida.

There was statistically insignificant difference between the 2 groups with respect to gravidity (P=0.220).

The mean gestational age in the paracetamol Group (Group A) was 38.8+/-1.014 and in control group was 38.8+/-1.01.

The difference was statistically insignificant between both groups(P =0.889)

Mean VAS Score in the study group was 8.06 and in the control group was 8.26.The difference was not statistically significant between both groups (P = 0.167)

In the study group the mean VAS score was decreased statistically from 8.06 before paracetamol infusion to 5.83 after one hour of paracetamol infusion.

The difference was statistically significant (P = 0.0001).

The mean drug delivery interval in the study group (Group A)was 6.86 +/-5.31 hours and control group (Group B)was 9.65+/-7.16 hours.

The difference between both groups was statistically significant (P = 0.041).

In the study group (Group A)32 women had spontaneous vaginal delivery, 2 underwent caesarean section 1.4% (1 women) had instrumental delivery.

In control Group 22 women (31.4%) had normal delivery, 8 women underwent caesarean delivery and 5 had instrumental delivery.

In the study group no statistically significant observation obtained regarding APGAR score at 1 minute (p=0.893) and 5 minute(p=0.303). No maternal complications observed.

Paracetamol commonly used over the counter available medication for analgesia in all age groups. It is centrally acting inhibitor of COX and Serotonergic system, that inhibit prostaglandins synthesis.

In our study, Paracetamol infusion used as labor analgesia. There was decrease in visual analog scale (VAS) score after one hour of paracetamol infusion and no maternal and fetal complication found. There was significant reduction in mean duration of labor (Drug-delivery interval).

Our results was similar to various other studies with regard to IV Paracetamol and other analgesics or placebo.

In study conducted by Lallar Meenakshi *et al.* demonstrated that pain perception has been significantly reduced after1 and 3 hour after Paracetamol infusion according to McGill pain score (p=0.000). Significant reduction in duration of labor(p=0.00) and drug delivery interval(p=0.001) also observed in paracetamol administrated group when compared to tramadol infused group[8].

In 2017 Karim *et al*. concluded that there was significant reduction in VAS score after 15min and 30 minutes of paracetamol infusion[9].

In Neha gurg and Vanitha V G study it is showed that VAS has been significantly decreased in paracetamol group when compared to tramadol group after 1 hour and 3 hours of paracetamol administration. There was decrease in both drug-delivery interval(p=0.0001) and duration of labour(p=0.0001) observed in paracetamol group[10]. In study conducted by JeetinderKaur Makkar *et al.* VAS score were comparable in both group but there was a significant reduction in duration of 1st stage of labour in paracetamol administered group compared to tramadol group[11].

Dr Jaspalkaur *et al*. concluded that there was significant drop in VAS score after paracetamol infusion after 30minutes and 60 minutes when compared placebo group. Also observed that there is a reduction in 1stand 2ndstage of labour in paracetamol administered group[12].

All the above studies and in our study also no fetomaternal adverse effects have been observed.

CONCLUSION

In the present study shows that for both primigravida and multigravida intravenous paracetamol works as an effective intrapartum analgesia.

It is also found that shortens the duration of labour without any fetomaternal adverse effects. In Developing countries like India, paracetamol infusion can beused as better labour analgesic due to easy availability, afford ability, minimal monitoring and no significant side effects.

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