



INTRAVENOUS PARACETAMOL AS AN INTRAPARTUM ANALGESIC

Obstetrics & Gynecology

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ABSTRACT

Purpose: This study was done to note the efficacy of intravenous paracetamol as a labour analgesic.

Method: This prospective-randomized study was conducted in 100 primigravidae at term pregnancy in active labour. They were given single dose of intravenous 1000mg Paracetamol. Pain intensity was recorded by Visual Analogue Scale before, one and three hours after drug administration. Labour events were recorded in a partograph. Perinatal outcome and maternal complications were observed.

Results: Before drug administration, 0% had mild or no pain, 24.5% moderate pain and 75.5% severe pain. After 1 hour of paracetamol administration, only 32.7% of women had severe pain, 57.1% moderate pain, 10.2% mild pain and 0% no pain. After 3 hours, 37.8% of women had severe pain, 46.9% moderate pain and 15.3% mild pain. There were no NICU admissions. 5% women had nausea, 2% vomiting and 5% PPH (mainly traumatic) as their complications.

Conclusion: Intravenous paracetamol appears to be an effective labour analgesic with minimal side effects.

KEYWORDS

Intravenous paracetamol, Labour analgesic.

Introduction:

"The delivery of the infant into the arms of a conscious and pain free mother is one of the most exciting and rewarding moments in medicine" – Moir

Labour signifies one of the most happy as well as one of the most painful moments in a woman's life. If not dealt properly, labour can lead to unpleasant experiences, mental agony and stress. The experience of labour pain is a highly individual reflection of variable stimuli. Pain during 1st stage of labour originates due to cervical dilatation and uterine muscle wall ischemia. During the late 1st and 2nd stages of labour, vagina and perineum form additional sources of pain. The associated increase in sympathetic activity leads to increased oxygen consumption, respiratory alkalosis, metabolic acidosis which would lead to decreased oxygen being transferred to foetus. Psychological aspect also determines the intensity of pain an individual perceives. Pain relief during labour is expected to reduce maternal stress and improve maternal and perinatal outcome. The decision to receive any form of pain relief should be the patient's informed decision.

Advances in the field of labour analgesia have tread a long journey from the days of ether and chloroform⁽¹⁾ to the present day practice of comprehensive program of labour pain management using evidence based medicine. Regional analgesia is the gold standard nowadays in developed countries⁽²⁾. But most modern obstetric analgesic practices require the participation of expert anaesthesiologist, costly equipment and continuous monitoring facilities which unfortunately cannot be availed in routine obstetric practice in the developing countries like India, where a majority of obstetric services are in the hands of trained nurses and non specialist doctors. In such situation, a method with minimum technicality is desired. Here comes into picture, the drugs like paracetamol in the field of labour analgesia, especially in the developing countries like ours.

PARACETAMOL, the mode of analgesic action of which has still not been fully elucidated but probably is a centrally acting drug, mainly inhibits prostaglandin synthesis and/or interaction with the serotonergic system. Various studies have proved intravenous paracetamol as an effective analgesic agent which is safe, inexpensive and requires no special monitoring⁽³⁾⁽⁴⁾⁽⁵⁾. But there are very few trials regarding paracetamol analgesic effect on labour pain in women⁽⁶⁾⁽⁷⁾⁽⁸⁾⁽⁹⁾⁽¹⁰⁾. If proved to be an effective analgesic agent in labour, paracetamol being inexpensive and simple to administer could be a good agent for obstetric analgesia in developing countries.

We undertook this hospital based prospective randomised study with the aim to note the efficacy and safety of single dose 1000mg

intravenous paracetamol as labour analgesic in primigravidae women during active phase of labour.

Materials and Methods:

The present study was a single-blinded prospective-randomized study conducted in 100 primigravidae women in Gauhati Medical College and Hospital, Guwahati, during the year 2015-2016. Inclusion criteria were primigravidae with full-term pregnancy with spontaneous onset of labour with single foetus in vertex presentation in active phase of labour and those willing to participate after counselling and obtaining written and informed consent. Active phase of labour was described as cervical dilatation more than or equal to 4 cm, cervical effacement more than or equal to 50%, and good uterine contractions. Women with clinical evidence of cephalo-pelvic disproportion, malpresentation, multiple pregnancies, previously scared uterus (post myomectomy), preterm labour, induced labour, antepartum haemorrhage, pregnancy induced hypertension, history of drug allergy, medical disorders, foetal distress and intrauterine foetal death were excluded from the study. After taking informed consent, proper history and examination, the women received a 100ml intravenous infusion containing 1000 mg of paracetamol single dose over 15min. Pain intensity before administering drug was recorded by Visual Analogue scale. The VAS score was further divided as: 0cm: no pain, 0.1-3.9cm: mild pain, 4-6.9cm: moderate pain and 7-10cm: severe pain. Labour was monitored using a WHO modified partogram. Measurement of pain relief was done by VAS score after 1 and 3h of drug administration. Mode of delivery, neonatal outcome, duration of labour, drug delivery interval, and side effects of the drug were noted.

Results:

In this study, 100 patients of different age group were studied to evaluate efficacy and safety of paracetamol in providing pain relief during labour and its side effects on mother and the newborn.

Table 1: Summary of statistical analysis of study

	Mean	SD
Age in years	21.72	± 2.92
Gestational age in weeks	38.44	±1
Dilatation of cervix in cms	4.52	±0.85
Effacement of cervix in %	80.8	±16.31

We used the Visual Analogue Scale to measure the pain intensity and found that before drug administration, maximum patient i.e. 75.5% of women had severe pain whereas 24.5% had moderate pain, and none had mild or no pain. After 1 hour of drug administration, only 32.7% of women had severe pain, 57.1% moderate pain and 10.2% mild pain. After 3 hours 37.8% of women had severe pain, 46.9% moderate pain and 15.3% mild pain. (table2)

Table 2: Showing degree of pain relief

PAIN INTENSITY	Before drug administration		After 1 hour of drug administration		After 3 hours of drug administration	
	N=98*	%	N=98*	%	N=98*	%
0cm (no pain)	0	0%	0	0%	0	0%
0.1-3.9cm (mild pain)	0	0%	10	10.2%	15	15.3%
4-6.9cm (moderate pain)	24	24.5%	56	57.1%	46	46.9%
7-10cm (severe pain)	74	75.5%	32	32.7%	37	37.8%

*Two patients were excluded from the calculation as they underwent LSCS

The mean VAS score decreased significantly from 8.2 (before drug administration) to 6.0 (after 1 hour of drug administration) and 5.6 (after 3 hours) (table 3)

Table3 : showing mean VAS score at different intervals

Mean VAS	mean	SD
Before drug administration	8.2	±1.06
After 1 hour of drug administration	6.0	±1.43
After 3 hours of drug administration	5.6	±1.43

The mean duration of the active phase of first stage of labour was 230mins (3hrs50mins) ±50mins. The mean duration of the second stage of labour was 40±10mins. The mean duration of third stage of labour was 7±1.20mins Total duration of labour from enrolment in study to delivery was 278mins (4hrs38mins) ±51. Drug delivery interval was 271mins (4hrs31mins) ±51.20mins

In the study, it was found that, Apgar score readings at 1 min was 7, 8 & 9 scores in majority i.e. 91% of babies, which defined good outcome. At 5mins Apgar score readings were 7, 8 & 9 in 95% babies. There were no NICU admissions. The mean Apgar score of neonates at 1 min was 7.51±0.77 and at 5 min was 8.75±0.58.

5% of the cases had nausea, 2% had vomiting and 5% of cases had PPH as their complication. No women had respiratory depression.

Discussion

In India, systemic drugs like pethidine, pentazocine, tramadol, paracetamol etc. are useful in places where expert anaesthesiologist and costly equipments are missing. Very few have studied paracetamol as a labour analgesic.

In the present study we found that, paracetamol had a significant decrease in pain intensity, after 1 and 3 hours of intravenous administration, about 72.5%. VAS reached the lowest value after 1 hour of drug administration. There was further decrease in mean VAS after 3 hours (6.0 to 5.6). Studies were conducted by *Meenakshi Lallar et al*⁽¹⁰⁾ and *Hema Mohan et al*⁽⁹⁾ to compare intravenous paracetamol and intramuscular tramadol. They found that paracetamol group had a significant decrease in pain intensity at 1 and 3 hours after intravenous paracetamol administration as compared to intramuscular tramadol group. About 75 % women in the paracetamol group had substantial relief of pain which lasted for 3 hours. *Elbohuty et. al*⁽⁵⁾ in his study randomized primiparous women to receive pethidine or paracetamol and observed analgesic effect of paracetamol lasted for at least 2 hours and was better than pethidine.. *Karim H. I. Abd-El-Maeboud et al, 2014*⁽⁷⁾, compared the efficacy of an i.v. paracetamol during the active phase of labour with sterile water (placebo) and found that, compared to controls, i.v. infusion of paracetamol was associated with significantly lower VAS score 15 and 30min after the start of medication; also, there was a significantly lower incidence of need for rescue medication at 60min after the start of medication.. These studies gives us an interpretation that paracetamol might be a better analgesic than tramadol or pethidine.

Meenakshi Lallar et al⁽¹⁰⁾ and *Hema Mohan et al*⁽⁹⁾ observed significant reduction in the duration of 1st, 2nd and 3rd stages of labour after administration of intravenous paracetamol, hence total duration of labour was reduced in patients who received paracetamol as compared to tramadol. More studies are required to elucidate the effect of intravenous paracetamol on labour duration, because a decrease in

labour duration has multiple potential benefits and better maternal and perinatal outcome, such as decrease in the incidence of complications associated with prolonged labour and in turn decrease in incidence in operative deliveries.

Neonatal and maternal outcomes were favourable with paracetamol in our study. *Karim H. I. Abd-El-Maeboud et al, 2014*⁽⁷⁾, and *Ahmed E.H. Elbohuty et al, 2012*⁽⁵⁾ also found that paracetamol have fewer maternal or neonatal adverse effects as compared to opioids and hence may be a safer intrapartum analgesic.

Conclusion:

Obstetric analgesia strives at making childbirth a pleasurable and painless event. Findings from the present study demonstrate that intravenous paracetamol is an effective labour analgesic and has fewer maternal adverse effects with a favourable neonatal outcome. Thus intravenous paracetamol is simple, safe, cost effective feasible option as labour analgesic in developing countries with low health care resource settings. Larger studies in this regard could further help establish the efficacy.

References:

1. ASA newsletter – September 1997, Volume 69, Number 9.
2. Pandya ST. Labour analgesia: recent advances. Indian J Anaesth. 2010;54(5):400–8.
3. Sinatra RS, Jahr JS, Reynolds LW, et al. Efficacy and safety of single and repeated administration of 1 gram intravenous acetaminophen injection (paracetamol) for pain management after major orthopedic surgery. Anesthesiology. 2005;102:822–31.
4. Arslan M, Celep B, C, ic, ck R, et al. Comparing the efficacy of preemptive intravenous paracetamol on the reducing effect of opioid usage in cholecystectomy. J Res Med Sci. 2013;18:172–7.
5. Ahmed E.H. Elbohuty et al, Intravenous infusion of paracetamol versus intravenous pethidine as an intrapartum; International Journal of Gynecology and Obstetrics 118 (2012) 7–10.
6. Mohammad-Hasan Abdollahi et al; Intravenous paracetamol versus intramuscular pethidine in relief of labour pain in primigravid women; Nigerian Medical Journal | Vol. 55 | Issue 1 | January-February | 2014 Page 54-57.
7. Karim H.I. Abd-El-Maeboud et al; Intravenous infusion of paracetamol for intrapartum analgesia; J. Obstet. Gynaecol. Res. Vol. 40, No. 11: 2152–2157, November 2014.
8. Jeetinder Kaur Makkar et al; Comparison of analgesic efficacy of paracetamol and tramadol for pain relief; Journal of Clinical Anesthesia (2014).
9. Hema Mohan et al, Intravenous paracetamol infusion versus intramuscular tramadol as an intrapartum labour analgesic ; Int J Reprod Contracept Obstet Gynecol. 2015 Dec;4(6):1726-1729.
10. M Lallar, et al. Intravenous Paracetamol Infusion Versus Intramuscular Tramadol as an Intrapartum Labour Analgesic The Journal of Obstetrics and Gynecology of India (January–February 2015) 65(1):17–22.