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Original Article

A Comparison between Epidural and IV Tramadol for Painless Labor and Effect on Perinatal Outcome

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Abstract

Objectives: To compare the efficacy of epidural and I/V Tramadol for painless labor and effect on perinatal outcome. *Material and methods:* A total of 90 parturients admitted in S.N. Medical College, Agra were selected for study. Thirty parturients received intravenous tramadol, thirty received epidural tramadol and thirty were kept as controls by the method of randomization. In the intravenous group, tramadol in doses of 1mg/Kg body weight IV bolus and 100mg in 500ml Ringer lactate at the rate of 8-24 drops/min was given. In the epidural group tramadol 1mg/kg body weight with 8-10 ml of 0.25% bupivacaine was given. *Results:* In the epidural group, pain relief was excellent in 36.67%, good in 50% and average in 13.33%. In intravenous group, pain relief was excellent in 10%, good in 26.67% and average in 63.33%. In both the groups there was no significant effect on duration of 1st & 3rd stage of labor. Second stage of labor was prolonged in the control group. There were no significant changes in APGAR scoring. *Conclusion:* Epidural tramadol is a safe and effective method for labor pain relief better than I/V tramadol.

Keywords: epidural, tramadol, painless labor

Introduction

It is never the fear of bringing a new life into the world that frightens a woman; it is the fear of the pain she has to endure to do it. Thus in today's age, we can help most women who have access to health care to make labor less painful and have a wonderful memory of the birth of her child.

It is now well recognized that the only consistently effective method of pain relief during labor is lumbar epidural analgesia. Epidural labor analgesia possesses a long record of safety and has few associated complications. Recent surveys indicate that nearly 60% of the parturients in the United States[1] use epidural analgesia during labor. Tramadol, a centrally acting opioid analgesic with activity similar to pethidine but with less fetal respiratory depression is currently being evaluated in women undergoing labor.

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Material and methods

The present study was conducted in the department of Obstetrics & Gynaecology, S.N. Medical College, Agra. Ninety parturients with 37-41 weeks of pregnancy were selected. Both primipara and multipara women in established active stage of labor (uterine contraction 2 per 10 minutes, lasting for 30 to 40 seconds and cervical dilation more than 3 cm.) with vertex presentation and willing for analgesia were included in the study. Women with malpresentations, cephalopelvic disproportion,

previous cesarean section, antepartum hemorrhage, any medical complications (diabetes, asthma, primary pulmonary hypertension, hypertensive disorders of pregnancy etc.) were excluded from the study.

All the selected women were randomly divided into study and control groups. Study group was subdivided into two groups. In first group tramadol in doses of 1 mg/Kg body weight I/V bolus and 100 mg in 500 ml Ringer's lactate drip at the rate of 8-24 drops/min was given and in second group tramadol in doses of 1 mg /kg body weight along with (8-10) ml of 0.25% bupivacaine was given by epidural route. 500ml of Ringer's lactate solution was given to every parturient before they were subjected to epidural analgesia to reduce the incidence of maternal hypotension of fetal heart rate disturbances. An 18 gauge epidural needle was placed in L2/3 or L3/4 interspace by midline approach. Epidural space was identified by the standard technique of loss of resistance and negative pressure method. Injections into the epidural space during contractions were avoided and were given in between contractions so as to avoid the risk of increased spread. The top-up dose was given when verbal rating scale was grade-II (moderate pain). In verbal rating scale, individuals were asked to rate their pain on a scale similar to one of those illustrated as Grade 0-No pain, Grade 1-mild pain, Grade 2-moderate pain, Grade 3-severe pain, and Grade 4–intolerable pain. After the administration of the drug, progress of labor was assessed by a partogram in every woman. Fetal condition was observed carefully by Doppler every half hour. In women having fetal bradycardia/tachycardia, top up doses were not given and were managed accordingly.

Statistical analysis was carried out by using the Student t test for significance of difference between two means and Chi-square test for significance of difference between two proportions. Difference among groups were considered to be significant at $p<0.005$.

Results

Most of the women were in the age group of (20-30) years (Table1). In all groups primiparas were 46.66% and multiparas were 53.34%. Amongst multiparas majority were gravida two and three.

Mean time required for onset of analgesia in I/V tramadol group was 13.67min and in epidural tramadol group was 10.83 min. The difference was statistically significant ($p<0.005$) (Table 2). Mean duration of analgesia in I/V tramadol group was 3.07 hrs and in epidural tramadol group it was 3.77 hrs. The difference was statistically significant ($p<0.01$). Pain relief of grade-0 level was in 36.6% women of epidural group and 10% women of I/V group ($p<0.05$) (Table 3). On analyzing the effect of analgesia on the duration of various stages of labor in both the groups, we found that there was no significant change in the 1st and 3rd stage of labor, whereas in epidural group, 2nd stage was

Table 1.

Parturient's profile

Parturient's profile	Intravenous group	Epidural group	Control group	P value
Mean age (yrs)	24.67	25	24.76	>0.05
Mean gestational	38.83	38.63	38.63	>0.05
Age (weeks)				
Mean cervical dilatation (cm)	4.73	4.53	5	>0.05
Mean fetal heart rate (per min)	137.33	138.67	142.67	>0.05

Table 2.

Time for onset of analgesia after first dose of tramadol

Time (min)	Intravenous group		Epidural group	
	No.	%	No.	%
No Relief	2	6.67	-	-
0-5	-	-	-	-
6-10	4	13.34	16	53.33
11-15	11	36.6	10	33.33
16-20	11	36.67	2	6.67
21-25	1	3.33	2	6.67
26-30	1	3.33	0	-
Total	30	100	30	100
Mean	13.67		10.83	
SD	5.691		4.346	
	p<0.05			

Table 3.

Degree of pain relief in both groups

Degree of pain relief	Intravenous group		Epidural group		Control group	
	No	%	No	%	No.	%
No pain (Grade 0)	3	10	11	36.67	-	-
Mild pain (Grade 1)	8	26.67	15	50	-	-
Moderate pain (Grade 2)	19	63.33	4	13.33	11	36.67
Severe pain (Grade 3)	-	-	-	-	14	46.67
Intolerable pain (Grade 4)	-	-	-	-	5	16.66
	p<0.05					

significantly prolonged (p<0.05). There was no significant change in vaginal delivery rates in both groups (p>0.05) (Table 4).

In intravenous group no side effects were seen in (10%) cases, nausea and vomiting was present in (20%) cases, dry mouth in (10%) and drowsiness and hypotension in (23.34%) cases whereas in epidural group no side

Table 4.

Maternal and neonatal parameters after labor analgesia

Parameters	Intravenous group		Epidural group		Control group		P value
Mean duration of stages of labor	Prima	Multi	Prima	Multi	Prima	Multi	
1st (min)	369.2	180.6	358.9	190.3	356.0	188.1	>0.05
2nd (min)	46.7	22.8	70.3	33.7	40.3	24.0	<0.05
3rd (min)	11.6	7.6	11.7	7.6	11.7	7.5	>0.05
% of vaginal delivery	93.3		86.6		90.0		>0.05
Mean Apgar score at birth	8.0		8.2		8.3		>0.05

Table 5.

Parturient satisfaction in intravenous and epidural groups

Grades	Intravenous group		Epidural group	
	No	%	No	%
Poor	-	-	-	-
Average	19	63.33	4	13.33
Good	8	26.67	15	50.00
Excellent	3	10.00	11	36.67
		p<0.05		

effects were seen in (33.33%) cases, nausea vomiting seen in (6.67%) cases, drowsiness in (33.33%) cases and hypotension seen in (13.33%) cases. P value less than 0.05 denoted that side effects were less in epidural group. Excellent parturient satisfaction was in 36.67% women of epidural group and in 10% women if I/V group (p<0.05) (Table 5).

Discussion

Epidurally administered opioids provide promise as ideal analgesics for labor because of their selective effect on perception of pain and sparing of motor, autonomic and other sensory modalities. Drugs which have shorter onset of action were more acceptable to parturients. Quick relief from pain is as important as

Table 6.

Mean Apgar score of neonates

Time	Intravenous group		Epidural group		Control group	
	Mean	SD	Mean	SD	Mean	SD
At 1 min	8.03	0.912	8.17	0.687	8.33	0.471
At 5 min	8.77	0.559	8.87	0.427	8.97	0.482
At 10 min	9.67	0.471	9.67	0.471	9.73	0.442

higher degree of relief of pain. In our study the mean time in minutes required for onset of analgesic action after I/V tramadol was 13.67 min. Observation of tramadol group in the present study is comparable to the study of Husslein[2]. Time taken for onset on analgesia in study conducted by Li[3] was greater than in the present study (26.10±5.4 vs 13.67±5.691).

In our study mean time required for the onset of analgesia in epidural tramadol group was (10.83±4.346) min, the duration of analgesia after the first dose of I/V tramadol was (3.07±0.883) hours and after epidural tramadol it was (3.77±0.573) hours. 50% of the women in epidural group required two top-up doses whereas 46.6% required one top-up dose and 3.33% of the women did not require top-up dose. In IV group maximum (63.35%) numbers of women were having pain relief of grade-2 type (moderate pain), whereas in epidural group 36.67% had grade 0 (no pain) relief and 13.33% had grade-2 (moderate) relief. Thus the difference in degree of analgesia in the two groups was statistically significant.

In both primigravidas & multigravidas there is significant prolongation of the 2nd stage of labor in the epidural group with no significant changes in the duration of 1st & 3rd stage of labor in different groups. Similar results were obtained by Long[4]. In their study 2nd stage was longer, (67±51) min. Outcome of labor was not significantly affected and incidence of cesarean section was not increased by the use of tramadol (intravenously or epidurally). Normal delivery occurred in 93.33% of the women in intravenous group, in 86.67% of the women in epidural group and in 90% of the women in control group. Forceps was applied in 3.33% of the women in intravenous group and in 6.67% of the women in epidural group. Cesarean section rate was 3.33% in intravenous group, 6.66% in epidural group, whereas Desai et al[5] reported 9.41% cesarean section rate in women of epidural group.

Apgar score of neonates was not significantly altered with epidural analgesia. Mean Apgar score at 1min in intravenous group was (8.03±0.912) and in epidural group it was (8.17±0.687). Similar results were obtained by Long4. They reported mean Apgar score at 1min in intravenous group as (8.87±1.55) and in epidural group as (9.50±0.62)

Maternal side effects in the form of nausea, vomiting, drowsiness and hypotension were less in epidural group as compared to intravenous group. The present study is comparable to study of Viegas[6] and Long[4]. All these side effects were minimal and did not warrant stoppage of the drug. Overall patients' satisfaction was excellent in 36.67% of the women of epidural group and in 10% of the women of intravenous group. In their study Desai et al[5] and Jain et al[7] reported "over 90%, of the women find epidural to be of great benefit in terms of pain relief. A smaller proportion (under 10%) find epidural to be of little or of no use. Women's satisfaction with epidural is correspondingly high in various studies including ours. 90.4% of our women would request and epidural in a subsequent pregnancy."

Conclusion:

Epidural tramadol is a simple and effective method for painless and safe delivery. Analgesia produced is significantly more effective than intravenous tramadol. Maternal side effects are minor without any fetal or neonatal respiratory depression.

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