

A study on influence of painless delivery on the maternal and neonatal outcomes: A hospital based study in Bihar

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Abstract:

Introduction: labour is a normal physiological process which causes unbearable pain to mothers. There are many methods developed for painless labor, out of which epidural analgesia is one of the commonly followed. The current study aims to evaluate the influence of painless delivery by epidural analgesia on the maternal and neonatal outcomes.

Material and Method: This was a hospital based prospective study conducted in Obstetrics and Gynecology department of Anugrah narayan magadh medical College and hospital , Gaya , Bihar. The study subjects were divided into 2 groups. The study group included pregnant patients who underwent for painless labor by epidural analgesia and the control group who were not given epidural analgesia. After applying inclusion and exclusion criteria, we could include 100 study and 100 control subjects. Informed consent was obtained from all the participants. Data was entered in SPSS software version 20, and analysis was done. A p-value<0.05 was considered to be statistically significant.

Results: The mean age of study group was 26.26±4.56 years while for control group it was 27.01±5.26 years. Mean duration of 2nd stage of labor was found to be significantly higher in study group (28.92±9.12 minutes) as compared to the control group (26.34±8.75 minutes). In the current study, the proportion of women developing post-partum haemorrhage and post-partum urinary retention was lower when compared to control group although neonatal outcome found to be same in both the groups. In study group, women are found to be highly satisfied regarding labor procedure in comparison of control group.

Conclusion: Epidural analgesia acts as an important way for painless labor having positive effects on maternal outcome with negligible side effects on foetus. Moreover the satisfaction rate in women who underwent for epidural analgesia is very high. So, the policymaker should focus on developing healthcare to make this option available everywhere.

Keywords: Painless delivery, Epidural analgesia, Maternal, Fetal, Labor, Outcome etc.

Introduction:

‘Labor is a series of events by which uterine contractions and abdominal pressure expel a fetus, placenta, and fetal membranes from the uterus between 38 to 42 weeks of gestation.[1,2]

Labor pain is a normal physiological process associated with a co-ordinated, regular uterine contractions, with progressive cervical dilatation and effacements. It is a good sign of progress of labor.[3,4,5] The causes of labor pain is different in different stage of labor. In the 1st stage, it results from distension of cervix and lower uterine segment in combination with uterine contraction. Pain in the 2nd stage of labor is caused by tissue damage in pelvis and perineum as foetus descends. [6,7,8] Labor pain is regarded as one of the severe pains which human being face in their lives. This pain is so unbearable that it has psychological effects on mothers after delivery. [9] Even during labor, due to excessive pain and anxiety, the progress of labor may stop leading to failure of child birth, which can put lives of mother as well as baby at stake.[10,11]

Since very long, clinicians are trying to curtail labor pain. The methods developed for painless labor are non-pharmacological or pharmacological. Non-pharmacological methods includes acupressure, acupuncture, reflexology, hydrotherapy, heat & cold, TENS (transcutaneous electrical nerve stimulation), sterile water injection, aroma therapy, music therapy, breathing exercises and different herbal preparations.[12] Pharmacological methods include inhalational analgesia, epidural analgesia and narcotics. [13,12]

Out of these epidural analgesia has been regarded as an effective way to alleviate labor pain but its effects on maternal and foetal outcome is a matter of concern. The current study aims to evaluate the influence of painless delivery by epidural analgesia on the maternal and neonatal outcomes.

Material and Methods: This was a hospital based prospective study conducted in Obstetrics and Gynecology department of Anugrah narayan magadh medical College and hospital , Gaya , Bihar. All healthy pregnant women with cephalic presentation, 37-42 weeks gestation, singleton pregnancy and who underwent painless delivery between Jan 2023 to Jan 2024 were included in the study. Women with diabetes, PIH (pregnancy induced hypertension), preterm labor, bleeding disorder, scoliosis and blood in epidural catheter are excluded from the study. Study subjects were divided into 2 groups. The study group included pregnant patients who underwent for painless labor by epidural analgesia and the control group who were not given epidural analgesia. In total we could enrol 100 participants in the study group. Hundred participants for comparison (control group) were taken from the same hospital. Informed consent was obtained from all the participants. After securing intravenous line and loading 500ml of ringer lactate, we waited for cervical dilatation. When the patient reaches active labor (cervical dilatation 3-4 cms), an epidural catheter 18 guaze was inserted in the study group. The analgesic administered was bupivacaine 0.125%. Top up doses were reserved for demand of patients. All patients were followed till delivery and

maternal and neonatal data were noted. Data was entered in SPSS software version 20, and analysis was done. A p -value <0.05 was considered to be statistically significant.

Results:

In the current study, 100 participants were in study group and 100 were in control group. As can be seen in the table 1, the mean age of study group was 26.26 ± 4.56 years while for control group it was 27.01 ± 5.26 years stating that study and control groups are comparable. The most common age group in both study and control group came out to be 18-25 years of age, followed by 26-30 years. As far as education is concerned, the proportion of illiterate, primary, secondary and college & above category was 14%, 32%, 42% and 12% in study group while in control group it was 8%, 40%, 36% and 16% respectively. Eighty percent women in both the groups were gravid one. In study group 82% were from rural background and 18% resided in urban area while in control group the proportion of rural and urban population was 74% and 26% respectively. When we observed socio-economic status of participants, it was found that maximum of them belonged to lower and middle socio-economic status. The association of study and control group with education, residence, gravida status and socio-economic status was found to be statistically non-significant.

Table 1: Socio-demographic characteristics of study participants

Sociodemographic parameter		Study group (n=100)	Control group (n=100)	t/ χ^2	p-value
Mean gest. age		26.26 \pm 4.56	27.01 \pm 5.26	1.077	0.282
Age	18-25	54	50	1.257	0.739
	26-30	42	45		
	31-35	4	4		
	>35	0	1		
Education	Illiterate	14	8	3.558	0.313
	Primary	32	40		
	Secondary	42	36		
	College and above	12	16		
Gravida	G1	80	80	0.533	0.766
	G2	16	14		
	G3	4	6		
Residence	Rural	82	74	1.865	0.172
	Urban	18	26		
Socioeconomic status	I	12	16	3.259	0.515
	II	18	26		
	III	42	34		
	IV	20	18		
	V	8	6		

When we compared duration of labor between two groups, it was found that the mean duration of 1st stage of labor in study group was 5.82±1.25 hours while in control group it was 6.12±1.05 hours. The difference in mean duration of 1st stage of labor between study and control group was not significant. Although, the mean duration of 2nd stage of labor was found to be significantly higher in study group (28.92±9.12 minutes) as compared to the control group (26.34±8.75 minutes).

Table 2: Comparison of duration of labor between two groups

Stage of labor	Study group	Control group	t	P
Mean duration in 1 st stage (hours)	5.82±1.25	6.12±1.05	1.838	0.067
Mean duration in 2 nd stage (minutes)	28.92±9.12	26.34±8.75	2.041	0.042

Table 3 depicts the medical intervention needed in study and the control group. It was seen that patients who underwent for painless delivery needed less medical intervention as compared to control group. In study group, 4% patients required ARM (artificial rupture of membrane) and 10% required iv oxytocin while in control group patients requiring ARM and iv oxytocin was 10% and 24% respectively. The difference in iv oxytocin requirement was found to be significant.

Table 3: Medical intervention during labor

Intervention	Study group	Control group	χ^2	P
ARM (artificial rupture of membrane)	4	10	2.765	0.096
iv oxytocin	10	24	6.945	0.008

We also compared maternal and neonatal outcome in study and control group. In study group, the proportion of women developing post-partum haemorrhage and post-partum urinary retention was 3% and 6% respectively, while in control group it was 4% and 8%. The difference in occurrence of PPH and urinary retention was not significant. The neonatal outcome was same in study and control group. In both the groups the proportion of neonatal asphyxia and foetal distress was 2% and 3% respectively.

Table 4: Comparison of maternal and neonatal outcome

Outcome	Study group	Control group	χ^2	P
PPH	3	4	0.148	0.700
Post-partum urinary retention	6	8	0.307	0.579
Neonatal asphyxia	2	2	0	1
Foetal distress	3	3	0	1

Apgar score of the neonates was seen at 1 minute and at 5 minutes. At 1 minute 12% of the study group neonates and 18% of the control group neonates were having Apgar score <7. At 5 minutes, the proportion of neonate having Apgar score <7 was 2% and 4% respectively. The association of Apgar score with study and control group was found to be non-significant.

Table 5: Apgar score of neonates

APGAR score		Study group	Control group	χ^2	P
1 minute	<7	12	18	1.412	0.234
	≥ 7	88	82		
5 minute	<7	2	4	0.687	0.407
	≥ 7	98	96		

We also asked regarding satisfaction of delivery process to both the groups. The overall satisfaction in patients with painless labor was 88% while in control group it was 64%. In study group, 56% of the patients were very satisfied and 32% were satisfied while only 12% were unsatisfied. In control group, 30% of women were very satisfied and 34% were satisfied. The % of unsatisfied women in control group was much higher i.e. 36%. The difference in satisfaction rate between study and control group was found to be statistically significant. (Table 6)

Table 6: Comparison of satisfaction rate

Satisfaction level	Study group	Control group	χ^2	P
Very satisfied	56	30	19.921	0.000
Satisfied	32	34		
Unsatisfied	12	36		
Total	100	100		

Discussion:

Apart from improving quality of labor, painless delivery also improves neonatal and maternal outcome. [14,15] In our study, mean age of study and control group was 26.26 ± 4.56 years and 27.01 ± 5.26 years respectively, which is higher than that found by Gupta N et al. (23.72 years). [16]

In our study we found that administration of epidural analgesia has minimum effect on duration of 1st stage of labor as difference in duration between study and control group was found to be comparable and non-significant. Although 2nd stage of labor was found to be significantly higher in study group than the control group. Agarwal D also found parallel results in her study stating 1st stage to be shorter and 2nd stage to be prolonged in epidural group when compared to control group. [17] Another study by Chaurasia A et al. found similar result as the also found mean duration of 2nd stage of labor to be significantly higher in group with epidural analgesia. [4] Somuah M et al. found same result of prolonged 2nd stage of labor in his cochrane review including 38 studies. [18] Study done by Mousa WF et

al. in 2010 found no effect of epidural analgesia on duration of 1st as well as 2nd stage of labor. [19]

In the current study we observed lesser requirement of ARM and iv oxytocin in study group as compared to control group. 4% and 10% of patients in study group required ARM and iv oxytocin. This is comparable to study by Chaurasia A et al.[4]

As far as maternal and neonatal outcome is concerned, it was found that incidence of PPH and Post-partum urinary retention is lower in study group than the control group. Although, the difference was not significant. This finding was supported by Lee K et al. in his study on Korean worker.[20]

The rate of neonatal asphyxia and fetal distress was similar in both the groups. So, our study could not find any effect of epidural analgesia on fetus. Giorgio Capogna concluded in her study that epidural analgesia in the absence of maternal hypotension or uterine hypertonus causes minimal changes in FHR.[21]

Apgar score was not found to be significantly different in study and control group. This is in accordance with the Cochrane Database 2018.[18] Study done by Antonakou A found that Apgar score was significantly lower at 1 minute in epidural group, but 5 minutes, the 2 group did not show significantly different apgar score. [22]

In our study, the satisfaction rate of delivery process in study group was 88% as compared to control group where it was 64%. Leighton BL et al. also found satisfaction rate to be higher due to pain relief by epidural analgesia.[23]

In our study there was no difference in the rate of normal vaginal deliveries, instrumental deliveries and caesarean section .Study done by Wesam Farid Mousa, et al (2012) found similar results.[24]

Conclusion:

Epidural analgesia evolved as an effective method for painless labor. Unbearable pain during labor encourages more women to opt for painless labor. Although, Epidural analgesia prolongs the 2nd stage of labor, this method has positive effects on maternal outcome with negligible side effects on foetus. Moreover the satisfaction rate in women who underwent for epidural analgesia is very high. So, the policymaker should focus on developing healthcare to make this option available everywhere.

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