Original Research Article

Comparative study of epidural labour analgesia and programmed labour analgesia in relation to effect on ambulation and interventions required at a tertiary hospital

Ambika[1], Lalit Mohan Negi[2], Priyanshu Sharma[3*], Jassa Ram Thakur[4]

[1]Department of Health and Family Welfare HP Government, Operation Theatre Incharge Deen Dyal Upadhyay Zonal Hospital Shimla, District Shimla Himachal Pradesh, INDIA.
[2]Senior Resident Department of OBG, IGMC, Shimla, INDIA.
[3]Department of Health and Family Welfare Hp Government, Operation Theatre Incharge Civil Hospital Theog, District Shimla Himachal Pradesh, INDIA.
[4]senior Resident Department Of Anaesthesia Slbsmc Nerchok District Mandi HP, INDIA.
Email: ambikanegi88@gmail.com, negilalitmohan7@gmail.com priyanshusharma27@gmail.com

Abstract **Background:** Maternal pain relief benefits both the mother and her neonate. Hence option of labor analgesia should be given to all pregnant females. Numerous physical and psychological factors may influence the intensity and duration of labour pain and suffering. In present study we compared epidural labour analgesia and programmed labour analgesia in relation in relation to effect on ambulation and interventions required in labouring women at our tertiary hospital. **Material and Methods:** Present comparative, randomized study was planned to compare outcomes in epidural labour analgesia and programmed labour analgesia in parturients. The study group 1 received epidural analgesia with ropivacaine 0.2%+ fentanyl 2µg/ml. Whereas group 2 was given programmed labor analgesia which included Inj. Pentazocine 6mg I.V + Inj. **Results:** Mean age, parity distribution, period of gestation and mean cervical dilatation was comparable in both groups. Mean maternal heart rates, mean oxyhemoglobin saturation were comparable ($p>.05$) in both the groups during whole observation period. Parturient females were assessed on the basis of visual analogue scale (VAS), mean VAS was highly significant ($p<.0001$) between both the groups, the highly significant difference continued throughout labour. **Conclusion:** Epidural labour analgesia is a better option than programmed labour analgesia for pain relief in labour. In programmed labour satisfactory pain relief was not achieved and duration of analgesia was for shorter period. There was no effect on ambulation in either group as assessed by giving assisted trial walk.
Keywords: epidural labour analgesia, programmed labour analgesia, ambulation, parturients.

***Address for Correspondence:**
Dr Priyanshu Sharma, Department of Health And Family Welfare Hp Government, Operation Theatre Incharge civil Hospital Theog, District Shimla Himachal Pradesh, INDIA.
Email: priyanshusharma27@gmail.com
Received Date: 02/11/2020 Revised Date: 18/12/2020 Accepted Date: 10/01/2021
DOI: https://doi.org/10.26611/10151729

Access this article online

Quick Response Code:

Website: www.medpulse.in

Accessed Date: 26 February 2021

INTRODUCTION

Labor analgesia has evolved from 18th century with the use of ether to present day practice of regional techniques. Variety of regional techniques, non-pharmacological methods, systemic analgesia have remodeled pain management in parturient resulting in better satisfaction.[1] Maternal pain relief benefits both the mother and her neonate. Hence option of labor analgesia should be given to all pregnant females. Numerous physical and psychological factors may influence the intensity and duration of labour pain and suffering. [2] Physical factors

How to site this article: Ambika, Lalit Mohan Negi, Priyanshu Sharma, Jassa Ram Thakur. Comparative study of epidural labour analgesia and programmed labour analgesia in relation to effect on ambulation and interventions required at a tertiary hospital. *MedPulse International Journal of Anesthesiology.* February 2021; 17(2): 90-94. http://medpulse.in/Anesthsiology/index.php

include maternal age group, parity, and maternal condition, the condition of the cervix at the starting point of labour, and the relationship of the size and position of the foetus to the size of the birth channel.[3] Maternal and fetal effects of analgesia during labour remain central to discussions among patients, anaesthesiologist and an obstetrician6. The aim should be relief of pain without compromising maternal safety, progress of labour and fetal wellbeing. Epidural blockade comes close to being the ideal analgesic technique in labour. It provides continuous analgesia for an unpredictable period of time and to convert analgesia to anaesthesia if an operative intervention becomes necessary. Nowadays, less concentrations of local anaesthetics combined with opioids provides good analgesia with little motor blockade known as "walking epidural".[4] The pain relief starts sooner and lasts longer than either drug alone. It allows both the drugs to be used in lower concentration, thereby reducing the risk of local anaesthetic systemic toxicity as well as opioids side effects.[5] Programmed labor is simple, easy and effective method for painless delivery. In programmed labor a cocktail of drugs are given to provide labor analgesia.[6] Basic principles of Programmed labor are providing pain relief using analgesics and antispasmodics, ensure adequate uterine contractions and monitoring of labor events.[6,7,8] In present study we compared epidural labour analgesia and programmed labour analgesia in relation in relation to effect on ambulation and interventions required in labouring women at our tertiary hospital.

MATERIAL AND METHODS

Present comparative, randomized study was planned to compare outcomes in epidural labour analgesia and programmed labour analgesia in parturients. Study was conducted during August 2018 to July 2019 (1 year), in department of Anaesthesia at Kamla Nehru State Hospital for Mother and Child, Indira Gandhi medical College Shimla in collaboration with department of obstetrics. Institutional ethical committee approval was taken. Patients were enrolled in active stage of labour (cervical dilatation >4 cm). 80 parturient females fulfilling the inclusion criteria were randomized into two groups using computer-based block randomization.

Inclusion criteria

- Parturients 18-40 years, term singleton pregnancy with vertex presentation with spontaneous or induced labour. ASA1 and ASA2 with uncomplicated pregnancy, Reactive NST, requested labour analgesia for pain relief
- Not having any contraindication to epidural analgesia

Exclusion criteria

- Hypersensitivity to study drugs
- Bleeding disorders, decreased platelet counts
- Spinal column deformities, spine surgery
- Malpresentation, cephalopelvic disproportion, previous lower segment cesarean section and placenta previa, medical disorders complicating pregnancy, delivery within 2 hours of labour analgesia
- Not willing to participate

The study group 1 received epidural analgesia with ropivacaine 0.2%+ fentanyl 2µg/ml. Whereas group 2 was given programmed labor analgesia which included Inj. Pentazocine 6mg I.V + Inj. Diazepam 2mg I.V + Inj. Tramadol 1-1.5 mg/kg I.M thereafter a dose of injection Drotaverine 40 mg I.V.(max. Of 3 doses) were given. Partographic monitoring of fetal heart rate was done throughout the labour. Parturient females were assessed on the basis of visual analogue scale (VAS) on a scale of 0 to 10 , 0 being no pain and 10 was worst pain possible. Neonatal assessment was done by assessing APGAR score at 1 and 5 min by neonatologist.

Effect on ambulation(EOA) was categorized as having either:-

1. No effect-able to walk properly or ambulate.
2. Mild effect-feeling of numbness in the legs but not interfering with ability to walk or ambulate.
3. Severe effect-Inability to walk or ambulate.

A pre designed structured proforma was used to collect the information about patients from her hospital records. Various independent(age, study group, drugs, dosing, baseline vitals etc.) and dependent variables (Vitals, VAS, Ambulation, APGAR, Side effects, etc.) were recorded in same proforma for further analysis. Data collected from patient's records was transferred into MS Excel sheet for further processing and analysis. Qualitative variables were expressed in term of frequencies, proportion and 95% Results were evaluated using statistical tests (student t test and chi square test), p value <.05 was considered as significant and p value <.001 was considered as highly significant The data of the study were recorded in the record chart and results were evaluated using statistical tests (student t test and chi square test), p value <.05 was considered as significant and p value <.001 was considered as highly significant.

RESULTS

The mean age (years) was 26.72 ± 4.26 years in group 1 and 25.17±4.17 years in group 2. Out of total 80 parturient females recruited in the study, in group 1, 23 (57.5%) were primiparous and 17 (42.5%) were multiparous. Whereas in group 2, 21 (52.5%) were primiparous and 19 (47.5%) were multiparous. The mean period of gestation was 37.97±1.14 weeks in group 1 and 38.25±1.25 weeks in group 2. Mean cervical dilatation at time of entry in study

was in group 1 was 4.95 ± 1.01 cm in group 1 and 5 ± 0.78 cm in group 2. Mean age, parity distribution, period of gestation and mean cervical dilatation was comparable (p>.05) in both groups. Maternal hemodynamic parameters were monitored. At 15 min the mean SBP started to increase in group 2 as compared to group 1 and the difference between the mean SBP became highly significant (p<.001) till 150 min. Thereafter the mean SBP was comparable (p>.05) in both the groups till the end of observed period. Mean maternal heart rates, mean oxyhemoglobin saturation were comparable (p>.05) in both the groups during whole observation period. Parturient females were assessed on the basis of visual analogue scale (VAS), mean VAS was highly significant (p<.0001) between both the groups, the highly significant difference continued throughout labour. The mean APGAR scores, mean duration of labor were comparable(p>.05) in both the groups. In group 1 no one required rescue analgesia whereas in group 2, all of them required rescue analgesia. In study group 1, out of total 40 parturient females 38(95 %) delivered by normal vaginal delivery, 2(5%) delivered by Caesarean section for non-progress of labour and deep transverse arrest. Whereas in group2, 39 (97.5%) delivered by normal vaginal delivery and 1(2.5%) delivered by caesarean section for fetal distress. In both groups, no effect on ambulation was noted in 97.5% patients, only 1 (2.5%) patient had mild effect on ambulation. No parturient in group 1 required local anaesthetic for episiotomy whereas in group 2 all parturient were given local anaesthetic before giving episiotomy. Out of 40 parturient females in group 1, 2 (5%) had complaint of pruritis, 2 (5%) had hypotension. In group 2 , 7 (17.5%) had nausea / vomiting and 3 (7.5%) had drowsiness.

Table 1: Characteristics of study patients

Characteristics	G 1 (Mean ± SD)	G 2(Mean ± SD)	P value
Mean age (years)	26.72 ± 4.26	25.17 ± 4.17	.104
Parity			
Primiparous	23 (57.5%)	21 (52.5%)	.653
Multiparous	17 (42.5%)	19 (47.5%)	
Period of Gestation (weeks)	37.97 ± 1.14	38.25 ± 1.25	.30
Cervical dilatation (cm)	4.95 ± 1.01	5 ± 0.78	.805
Duration of labour (min)	289.02±28.3	295.02±24	.3
Mode of delivery			
Normal vaginal delivery	38 (95%)	39 (97.5%)	
Caesarean section	2 (5%)	1 (2.5%)	
APGAR score			
1	7.52±0.64	7.52±0.50	>.99
5	8.55±0.59	8.70±0.46	.21
Effect on ambulation			
No effect	39 (97.5%)	39 (97.5%)	
Mild effect	1 (2.5%)	1 (2.5%)	
Severe effect			
Side effects			
No side effects	36 (90%)	30 (75%)	
Pruritus	2 (5%)	0	
Hypotension	2 (5%)	0	
Nausea/ vomiting	0	7 (17.5%)	
Drowsiness	0	3 (7.5%)	

DISCUSSION

Out of various methods for labour analgesia, epidural anaesthesia satisfies the basic requirements of labour analgesia. It decreases the pains of labour without affecting the tone of pelvic floor muscles . It also retains the sensation of baby's head in vagina thus allowing labour to progress unaffected. In present study, there was no increase in caesarean section rate with epidural labour analgesia. Caesarean delivery rate was 5% in epidural group and 2.5% in programmed labour group. Our results in group 1 were consistent with the study done by Chetty *et al.*.[9] where spontaneous vaginal delivery occurred in 95% of parturients and 2.5% parturient each had forceps and caesarean delivery who were given 0.2% ropivacaine in epidural. Cochrane review involving studies reported no increase in Caesarean delivery rates between women who received epidural vs systemic analgesia for labour.[10] Patkar *et al.*,[11] and Agarwal *et al.*..,[12] observed that the incidence of instrumental delivery does not relate to epidural analgesia or its method of administration or its time of initiation respectively, when low dose local anaesthetic with or without opioids were used. In present study, none

of the parturients had motor blockade with 0.2% ropivacaine combined with 2µg/ml fentanyl as assessed by giving assisted trial walk. Addition of fentanyl have added benefits of both improving analgesia and also decreases the dose of local anaesthetics, thus decreasing local anaesthetic related side effects. Similar results were comparable to Chetty at al.[9], they did not find motor blockade in any patient. Lee BB *et al.*, found no effect on ambulation with 0.2% ropivacaine used in epidural in 58 parturients in a randomized double-blind study.[13] Chhetty *et al...*[9] studied efficacy of 0.125% and 0.2% ropivacaine both mixed with fentanyl 2 mcg/ml for epidural labor analgesia, effective labor analgesia with no motor blockade was observed in both groups with no failure rate. Onset of analgesia was significantly faster in group 2(0.2% ropivacaine) as compared to group 1(0.125% ropivacaine). Duration of analgesia after initial bolus dose was also significantly longer in group 2 than in group 1. Mean VAS scores were significantly less in group 2 than in group 1 at 5, 60, and 90 min. There were no significant changes in hemodynamics, nor adverse effects related to neonatal or maternal outcomes in both groups. Wang W *et al.*[5] studied efficacy and safety of local anesthetics bupivacaine, ropivacaine and levobupivacaine in combination with sufentanil in epidural labour anesthesia and noted that analgesia duration was significantly longer in ROPI-SUF and LBUPI-SUF than in BUPI-SUF administered women with a mean difference of 16.12 and 18.02 respectively under a random effects model (REM). Effective analgesia achievement was significantly earlier in the BUPI-SUF than in either the ROPI-SUF or the LBUPI-SUF groups under a fixed effects model (FEM) but not under a REM. Motor blockade incidence was higher in BUPI-SUF anesthetized patients, although the difference was not statistically significant. A higher incidence of instrumental deliveries was evident in the ROPI-SUF and LBUPI-SUF groups than in the BUPI-SUF group of patients. Savita Konin *et al.*[6] conducted a prospective randomized clinical study of outcome of labor following a programmed labor (6 mg Pentazocine + 2 mg Diazepam I.V. bolus and then Inj. Tramadol in a dose of 1-1.5 mg/kg I.M., along with a single dose of Inj. Drotaverine 40 mg I.V). A significant pain relief of the parturients and shortening of all stages of labor especially significant reduction in duration of active phase of labor was noted. Study concluded that the programmed labor is simple, easy and effective method for painless and safe delivery. Daftary SN *et al.* [7] in a comparative study conducted on 200 parturient in each group concluded that in study group (received programmed labor) had mean shorter duration of active labor as 3.5 hrs. as compared to controls (received other form of analgesia other than programmed labor) of 5.2 hrs. Programmed labor with indigenous protocol developed and practiced, results in progressive, shorter and comfortable labors with lesser blood loss. In present study, we noted that epidural labour analgesia resulted in better pain relief as compared to the programmed labour analgesia. Epidural analgesia has minimum effect on maternal haemodynamics, while parturients in programmed labour group did not show any adverse effect on maternal haemodynamics. Duration of labour in epidural group was slightly less than programmed labour group, but there was no significant difference between the two. Epidural as well as programmed labour do not prolong duration of labour. There was no effect on ambulation in either group as assessed by giving assisted trial walk, no adverse effect on neonatal APGAR score at 1min. and 5min. and no significant effect on mode of delivery in both the groups.

CONCLUSION

Epidural labour analgesia is a better option than programmed labour analgesia for pain relief in labour. In programmed labour satisfactory pain relief was not achieved and duration of analgesia was for shorter period. There was no effect on ambulation in either group as assessed by giving assisted trial walk. There was no significant effect on mode of delivery or duration of labour was noted in both the groups.

REFERENCES

1. Pandya ST. Labour analgesia: Recent advances. Indian J Anaesth 2010;54:40
2. Sheiner E, Sheiner EK, Shoham-Vardi I. The relationship between parity and labour pain. Int J Gynaecol Obstet 1998;63:287-8.
3. Abushaikha L ,Oweis A. Labour pain experience and intensity. Int J Nurs Pract. 2005 Feb;11(1):33-8.
4. Campbell D. C., Zwack R. M., Crone L.-A.L., Yip R. W. Ambulatory labor epidural analgesia : bupivacaine versus ropivacaine, ANESTH. ANALG., 90, 1384-1389, 2000.
5. Lv BS, Wang ZQ, Wang XW, Wang JH, Fang F, Mi WD. Efficacy and safety of local anaesthetics bupivacaine, ropivacaine and levobupivacaine in combination with sufentanil in epidural anaesthesia for labor and delivery: a meta-analysis. Curr Med R es.opin. 2014;30(11):2279-89.
6. Konin S, Mhabalshetti NA. Programmed Labor-Protocol. Journal of Evolution of Medical and Dental Sciences. 2014;3(69):14770-6.
7. Daftary SN, Desai VS, Thanawala U, Bhide A, Levi J, Pataki A. Programmed Labor-Indeginous Protocol to Optimize Labor Outcome. South Asian Frederation of Obstetrics and Gynecology. 2009;1(1):61-4
8. Gupta k , Dubey S, Bhardwaj S, Parmar M. A programmed labour protocol for optimizing labour and delivery. International journal of reproduction, contraception , obstetrics and gynecology.2015 ;4(2): 457-460.
9. Chhetty YK, Naithani U, Gupta S, Bedi V, Agarwal I, Swain L. Epidural labor analgesia: A comparison of

ropivacaine 0.125% versus 0.2% with fentanyl. J Obstet Anaesth Crit Care 2013;3:16-22.
10. Anim-Somuah M, Smyth RMD, Howell CJ. Epidural versus non epidural or no analgesia in labour. Cochrane Database of Systemic Reviews 2005 Oct 19;(4):CD000331.
11. Patkar CS, Vora K, Patel H, Shah V, Modi MP, Parikh G. A comparison of continuous infusion and intermittent bolus administration of 0.1% ropivacaine with 0.0002% fentanyl for epidural labor analgesia. J Anaesthesiol Clin Pharmacol 2015;31:234-8.
12. Agrawal D, Makhija B, Arora M, Haritwal A, Gurha P. The effect of epidural analgesia on labour, mode of delivery and neonatal outcome in nullipara of India, 2011-2014. J Clin Diagn Res 2014;8:OC03-6.
13. Lee BB, Ngan Kee WD, Lau WM, Wong AS. Epidural infusions for labour analgesia: A comparison of 0.2% ropivacaine, 0.1% ropivacaine , and 0.1% ropivacaine with fentanyl.Reg Anesth Pain Med 2002;27:31-6.

Source of Support: None Declared
Conflict of Interest: None Declared