

INTERMITTENT EPIDURAL BOLUSES OF ROPIVACAINE AND SUFENTANIL PROVIDE BETTER LABOR PAIN CONTROL AND IMPROVES LABOR OUTCOME: COMPARATIVE STUDY VERSUS CONTINUOUS EPIDURAL INFUSION

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ABSTRACT

Objectives: Evaluation of the analgesic efficacy and pregnancy outcome of parturient receiving intermittent epidural boluses (IEB) or continuous epidural infusion (CEI) of ropivacaine 0.15% and sufentanil 0.2 g/ml combination.

Patients & Methods: 158 primipara were divided into two groups; CEI (Group I) received continuous infusion and IEB (Group II) received intermittent epidural boluses of ropivacaine 0.15% and sufentanil 0.2 g/ml combination. Efficacy of the procedure was evaluated using the Numeric rating scale (NRS) of pain and the Bromage score for motor block. The frequency of the need for labor augmentation, length of the 2nd stage of labor, mode of delivery and fetal outcome as judged by APGAR score, drug-related side effects and patients' satisfaction were recorded.

Results Mean NRS pain scores showed non-significant difference between patients of both groups. Mean duration of the 2nd stage of labor was significantly ($p=0.021$) shorter in group

II, the frequency of women required labor augmentation and cesarean section was significantly lower among those of group II. The frequency of neonates had APGAR score of 10 and excellent outcome was significantly in neonates of group II, but the frequency of parturient had nausea was significantly lower among parturient of group II. 83 parturient (52.5%) were most satisfied by the applied analgesic procedure, 51 parturient (32.3%) were satisfied and 18 parturient (11.4%) found the procedure is good modality of labor analgesia, while only 6 parturient (3.8%) found the procedure unsatisfactory. The frequency of women most satisfied and satisfied was significantly higher among those of group II in comparison to group I.

Conclusion: Epidural labor analgesia is effective, safe and appropriate modality for women in active labor especially primipara. Both epidural pain control techniques provided analgesia of non-significant difference. However, IEP was superior to CEI for provision of less motor block, higher spontaneous and assisted VD, shorter 2nd stage and lower CS rate.

INTRODUCTION

Childbirth is an important event in maternal life for their desire to be a mother, but it also raises maternal worries due to labor pain and possible risks (Sharma et al., 2018). Labor pain is probably the most severe pain a woman can experience during her lifetime, and is usually more severe and lasting longer in primigravida secondary to prolonged second stage of labor (Koridze et al., 2015). Variety of factors including maternal body mass index, gestational age, baby weight and occupation can influence the perception of labor pain (Akadri & Odelola, 2018).

Goals of painless delivery include mental relaxation during delivery with increased tendency to normal vaginal delivery (VD) and reduction of the rate of cesarean section (CS) and its related morbidities (Zakerihamidi et al., 2015). In modern obstetrics, different pharmacological and non-pharmacological options allow to obtain pain relief during labor targeting to women satisfaction about medical care (Gizzo et al., 2014). Pethidine (meperidine) is the commonest opioid analgesia currently used to provide pain relief in labor, but its routine use is questionable for its effectiveness, duration of action, its side effects including maternal sedation, nausea and potential transfer across the placenta to the fetus (Wilson et al., 2016).

Modern neuraxial labor analgesia represents a shift in obstetrical anesthesia and could be considered as the gold standard in labor analgesia (Sng & Sia, 2017). About 60% of women in the USA receive some form of neuraxial analgesia during labor (Grant et al., 2015), but concerns have been raised regarding whether

it negatively impacts the labor and delivery process (Sng et al., 2014).

Neuraxial labor analgesia can be provided via continuous spinal, combined spinal-epidural or stand-alone epidural (Heesen & Klimek, 2017). Stand-alone epidural was proved to provide efficient labor analgesia, but controversies about multiple technical points are still present regarding which is the best for maternal and fetal safety (Kranke et al., 2017); early or late initiation of epidural analgesia (Sng et al., 2014), continuous epidural infusion or programmed intermittent epidural boluses (Gizzo et al., 2014), the use of various adjuvants such as opioids, clonidine, and neostigmine in conjunction with local anesthetics solution (Kelly & Tran, 2017). This prospective comparative study aimed to evaluate the analgesic efficacy and pregnancy outcome of parturient receiving either intermittent epidural boluses (IEB) or continuous epidural infusion (CEI) of a combination of ropivacaine and sufentanil.

PATIENTS AND METHODS

This prospective interventional comparative study was conducted since June 2017 till June 2018 at Anesthesia, Pain & ICU Department, Benha University Hospital (BUH). All primigravida attending the emergency department at BUH in labor pain and were admitted under observation till get delivery were eligible for evaluation. At admission, full medical and obstetric history was obtained, weight and height were measured, and baseline blood pressure measures were determined and routine lab investigations were performed.

Exclusion criteria:

Exclusion criteria included ASA grade III or IV, presence of premature rupture of membrane, fever or high total leucocytic count, history of gestational hypertensive disorders, gestational or current diabetes mellitus, and renal, cardiac or liver diseases. Women who refused to receive epidural analgesia or to sign the informed written consent to participate the study were also excluded.

Inclusion criteria

Primipara with singleton fetus, normal fetal lie, cephalic presentation and intact membrane with cervical dilation of 3-4 cm, and were free of exclusion criteria were included in the study.

Sample size calculation

Previous similar studies detected significant difference between two groups including 30 parturient received epidural analgesia per group (Akkamahadevi et al., 2012; Patkar et al., 2015). Thus, the current study tried to achieve a study power of 85% with α value of 0.05 and β value of 0.2, so sample size was calculated to include at least 60 patients had successful epidural analgesia per group with significant difference regarding frequency of parturient reached score 4 on satisfaction evaluation.

Randomization and blindness

Enrolled parturient were randomly divided into two equal groups using cards carrying a label for each group that were enclosed in dark envelopes. Cards were prepared by an assistant who was blinded about the significance of the label. Cards were chosen by the patient herself and given to the author in charge

for carrying on the epidural injection. The used epidural infusions were freshly prepared by an assistant not included in the study and each bottle carries a label identical to that of the card. The second author, who did not participate in administration of epidural analgesia and was blinded about the group title, was responsible for evaluation of pain scoring, and motor block and development of drug or procedure-related complications, if any. The obstetrician was blinded about the drugs used for epidural analgesia.

Grouping

Parturient were divided into two groups according to the drugs used for epidural analgesia:

- Group I: included parturient assigned to receive continuous epidural infusion of ropivacaine 0.15% and sufentanil 0.2 g/ml. the pump for CEI was adjusted to deliver a bolus of the prepared solution of 5 ml every 20 minutes.
- Group II: included parturient assigned to receive intermittent epidural boluses (IEB) of a similar infusion, but at rate of 10 ml every 60 minutes.

Procedure of epidural analgesia**- Procedure**

All parturient had received preload with 500 ml of lactated Ringer' solution before initiation of analgesia. Non-invasive monitoring of maternal heart rate, blood pressure and monitoring of fetal heart rate was performed. Parturient were positioned in either lateral decubitus or setting positions according to the preference of the anesthetist in charge. The epidural space at level of L₃₋₄ or L₄₋₅

interspace was identified using the loss of resistance technique. Then, a 20 gauge epidural closed-end multi-orifice catheter (Perifix 401, B. Braun, Melsungen AG) was inserted through an 18-gauge Tuohy needle that was placed at chosen interspace and advanced 3 to 5 cm into the epidural space.

– Evaluation of success of the procedure

Baseline pain score was determined prior to conduction of the procedure of epidural analgesia. After completion of the epidural procedure, an initial loading dose of 10 ml of 0.15% Ropivacaine and 10 µg sufentanil was injected in the catheter. At 30-minutes after injection of the loading dose, success of the epidural procedure was assured if pain score was ≤ 3 indicated (T0 score) and parturient did not request additional epidural bolus.

Post-procedure evaluation

1. Intensity of labor pain sensation

Pain severity was assessed using an 11-point numeric rating scale (NRS) with 0 indicates no pain and 10 indicates worst pain imaginable. NRS was chosen for being more practical than the graphic visual analogue scale, easier to understand for most people, and does not need clear vision, paper, and pen (Fairbank et al., 1980; Fairbank & Pynsent, 2000). Labor pain intensity was assessed before conduction of the epidural procedure, 30-min after injection of the loading dose and every 30-min throughout the duration of the 2nd stage of labor.

2. Extent of motor power block

Extent of muscle power block was evaluated using the Bromage score for

epidural analgesia for ambulatory patients (Breen et al., 1993) which entails complete block (100%) as indicated by inability to move legs or feet (Grade IV); almost complete (66%) as indicated by inability to flex knees with free movement of feet (Grade III); partial block (33%) which indicates just ability to flex the knees with free movement of feet (Grade II) and no block (0%) which indicates free movement of knees and feet (Grade I). Parturient with motor block of Grade III or IV were excluded from statistical analysis and were considered as failure of the procedure.

3. Obstetric variables

- Frequency of the need for augmentation to improve progress of labor.
- Duration of the 2nd stage of labor: according to recommendations of the American Congress of Obstetricians and Gynecologists to allow infant safety, in women with epidural analgesia, the accepted upper limit of the 2nd stage of labor was ≥ 4 hours in nulliparous women and ≥ 3 hours in parous women (Leveno et al., 2016).
- Mode of delivery: normal spontaneous vaginal delivery, normal aided vaginal delivery, instrumental vaginal delivery, cesarean section
- Fetal outcome was evaluated using APGAR scoring system which entails evaluation of neonatal muscle tone, heart rate, grimace, skin color, respiratory rate. Each item was scored on 3-point scale (0, 1, 2) for a total score of 0-10 with score of 0-3 indicates severely depressed neonate, 4-6 indicates moderately depressed neonate and 7-9 indicates excellent neonatal condition and a baby that is born pink,

with a heart rate of >100 beats/minute, that withdraws from the stimulus, actively moves, and has a strong cry will receive a perfect APGAR score of 10. APGAR scoring was evaluated at 1-min & 5-min after delivery (Boyle, 1993).

4. Drug-related side effects

- Frequency and severity of nausea and vomiting as judged by a four-point scale consisted of 0: no nausea/vomiting, 1: mild nausea/vomiting (patient not requesting an antiemetic), 2: nausea/vomiting patient requesting an antiemetic and 3: nausea/ vomiting, resistant to antiemetic (Watcha & White, 1992).
- The level of sedation was assessed using Ramsay sedation scale with 1 indicates that patient is anxious and agitated, 2 indicates that patient is cooperative, oriented and tranquil; 3 indicates that patient is drowsy but responding to commands, 4 indicates patient shows brisk response to loud command or light glabellar tap; 5 indicates that patient shows sluggish response to loud command or light glabellar tap and 6 indicates patient is in deep sleep and gives no response to stimuli (Ramsay et al., 1974; Sessler et al., 2008).
- Pruritus, urinary retention, need for catheterization

Patients' satisfaction

- Patient's satisfaction with the applied analgesic procedure was assessed before home-discharge using four-point scale with 1 indicates patient is unsatisfied, 2 indicates good outcome, 3 indicates patient is satisfied and 4 indicated most satisfied.

Statistical analysis

Data are presented as mean, standard deviation (SD), numbers, percentages, median and interquartile range (IQR). Parametric results were analyzed one-way Anova test and non-parametric results were analyzed using Chi-square test and Mann-Whitney test. Statistical analysis was conducted using IBM® SPSS® Statistics (Version 22, 2015; Armonk, USA) for Windows statistical package. P value <0.05 was considered statistically significant.

RESULTS

The study included 218 parturient who were vulnerable for evaluation, 38 parturient were excluded for not fulfilling the inclusion criteria and 180 women were randomly divided into two groups. Patients' at admission data showed non-significant difference between parturient of both groups as shown in table 1.

Unfortunately, 22 parturient were excluded after application of the epidural analgesia; 5 parturient requested more than the loading dose of epidural analgesia to achieve NRS score of <3 at 30-min after catheter insertion; 7 parturient had motor block of >1 on Modified Bromage score and 10 parturient required rescue analgesia during the duration of the 2nd stage of labor despite of receiving the scheduled dose of epidural infusion. These 22 cases were considered as failed for a failure rate of 12.2% and were excluded from statistical analysis (Fig. 1). There was non-significant ($p=0.839$) difference between success rates; 85.6% and 90%, for epidural analgesia provided for patients of both groups, respectively.

Sixty-seven parturient (42.4%) required augmentation to allow progress

of labor; 39 parturient (50.6%) in group I and 28 parturient (34.6%) in group II with significantly ($p=0.04$) lower frequency of parturient required induction of labor among those of group II in comparison to parturient of group I. Mean duration of the 2nd stage of labor was significantly ($p=0.021$) shorter in group II; 163.8 ± 39.3 ; range: 109-258 min than in group I; 179.4 ± 44.9 ; range: 133-275 min (Fig. 2). Mean NRS pain score recorded 30-min after injection of the epidural test dose till end of the 2nd stage of labor showed non-significant difference between patients of both groups (Table 2, Fig. 3).

Regarding mode of delivery, 31 parturient (19.6%) were shifted to cesarean section; 20 (26%) and 11 parturient (13.6%) in groups I and II, respectively with significantly ($p=0.048$) lower incidence of CS among parturient of group II. Forty-three parturient (27.2%) had normal spontaneous vaginal delivery; 17 parturient (22.1%) in group I and 26 parturient (32.1%) in group II with non-significantly ($p=0.157$) higher frequency of women had spontaneous vaginal delivery among women of group II. Forty-six parturient (29.1%) had assisted vaginal delivery; 22 parturient (23.4%) in group I and 24 parturient (24.7%) in group II with non-significantly ($p=0.883$) higher frequency of women had assisted vaginal delivery among women of group II. Thirty-eight parturient (27.2%) had instrumental vaginal delivery; 18 parturient (23.4%) in group I and 20 parturient (24.7%) in group II with non-significantly ($p=0.847$) higher frequency of women had instrumental vaginal delivery among women of group II (Fig. 4).

As regards neonatal outcome, 59 neonates (37.3%) had APGAR score of 10; 88 neonates (55.7%) neonates had excellent outcome and only 11 neonates (8%) were moderately depressed at 1-min after 1-min, but at 5-min all of these 11 neonates had improved and no neonate requires admission to neonatal ICU. The frequency of neonates had APGAR score of 10 and excellent outcome was significantly ($p=0.041$) higher with significantly ($p=0.023$) higher median value of 1-min APGAR score in neonates of group II in comparison to those of group I (Table 3).

The frequency of parturient had nausea was significantly ($p=0.038$) lower among parturient of group II in comparison to those of group I, while the frequency of vomiting was non-significantly ($p=0.202$) higher in women of group I in comparison to women of group II. Similarly, distribution of studied parturient among sedation scores was non-significantly higher among women of group I in comparison to women of group II. Only three women complained of difficulty of urination but no women required urinary catheterization (Table 3).

Eighty-three parturient (52.5%) were most satisfied by the applied analgesic procedure, 51 parturient (32.3%) were satisfied and 18 parturient (11.4%) found the procedure is good modality of labor analgesia, while only 6 parturient (3.8%) found the procedure unsatisfactory. The frequency of women most satisfied and satisfied was significantly higher among those of group II in comparison to group I (Table 3).

Table (1): Enrolment data of patients of both groups

Data	Group I	Group II	p-value
Age (years)	26.4±2.8	26.9±2.6	0.217
Weight (kg)	87.3±4.3	86.4±4.6	0.221
Height (cm)	169.2±1.8	168.6±1.4	0.083
BMI (kg/m ²)	30.5±1.7	30.4±1.8	0.634
Gestational age (weeks)	38.6±0.8	38.8±0.6	0.861

Data are presented as mean, standard deviation; BMI: Body mass index; p-value indicates the significance of the intergroup differences; p<0.05 indicates significant difference; p>0.05 indicates non-significant difference

Table (2): NRS pain scores recorded during the 2nd stage of labor of patients of both groups

Time	Group I	Group II	p-value
T0	0.74±0.6	0.37±0.49	0.085
30-min	0.83±0.67	0.57±0.59	0.137
60-min	0.96±0.7	0.99±0.54	0.702
90-min	1.36±0.58	1.27±0.5	0.311
120-min	1.45±0.53	1.44±0.5	0.958
150-min	1.6±0.68	1.66±0.83	0.129
180-min	1.84±0.37	1.76±0.85	0.679
210-min	2	1.94±0.67	0.341
240-min	2	2	0.334
270-min	2	2	0.334

Data are presented as mean, standard deviation; T0: 30-min after injection of test dose; p-value indicates the significance of the intergroup differences; p<0.05 indicates significant difference; p>0.05 indicates non-significant difference

Table (3): Post-procedure outcome of patients of both groups

Time		Group I	Group II	p-value	
APGAR score	Score	0-3	0	0	0.041
		4-6	8 (10.4%)	3 (3.7%)	
		7-9	47 (61%)	41 (50.6%)	
		10	22 (28.6%)	37 (45.7%)	
	Median (IQR)	8 [7-10]	9 [8-10]	0.023	
Drug-related side effects	Nausea	0	27 (35.1%)	46 (56.7%)	0.038
		1	37 (48.1%)	29 (35.8%)	
		2	8 (10.4%)	4 (4.9%)	
		3	5 (6.4%)	2 (2.6%)	
	Vomiting	0	67 (87%)	77 (95.1%)	0.202
		1	7 (9.1%)	3 (3.7%)	
		2	3 (3.9%)	1 (1.2%)	
	Sedation	1	11 (14.3%)	9 (11.1%)	0.233
		2	46 (59.7%)	60 (74.1%)	
		3	13 (16.9%)	9 (11.1%)	
		4	7 (9.1%)	3 (3.7%)	
	Pruritis	Yes	5 (6.4%)	3 (3.7%)	0.424
		No	72 (93.6%)	78 (96.3%)	
	Urinary retention	Yes	2 (2.6%)	1 (1.2%)	0.424
		No	75 (97.4%)	80 (98.8%)	
	Patients' satisfaction	Score	1	5 (6.4%)	1 (1.2%)
2			12 (15.6%)	6 (7.4%)	
3			28 (36.4%)	23 (28.4%)	
4			32 (41.6%)	51 (64%)	

Data are presented as mean, standard deviation; IQR: Interquartile range; p-value indicates the significance of the intergroup differences; $p < 0.05$ indicates significant difference; $p > 0.05$ indicates non-significant difference

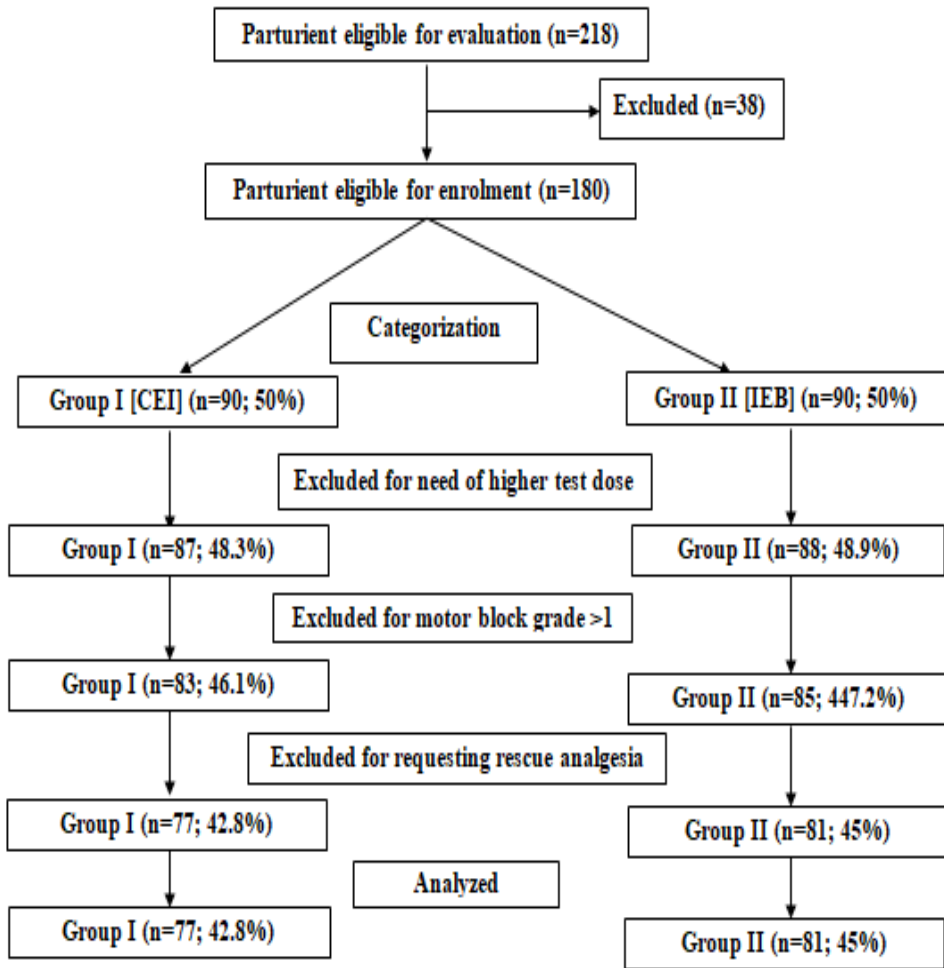


Fig. (1): Study Flow Chart

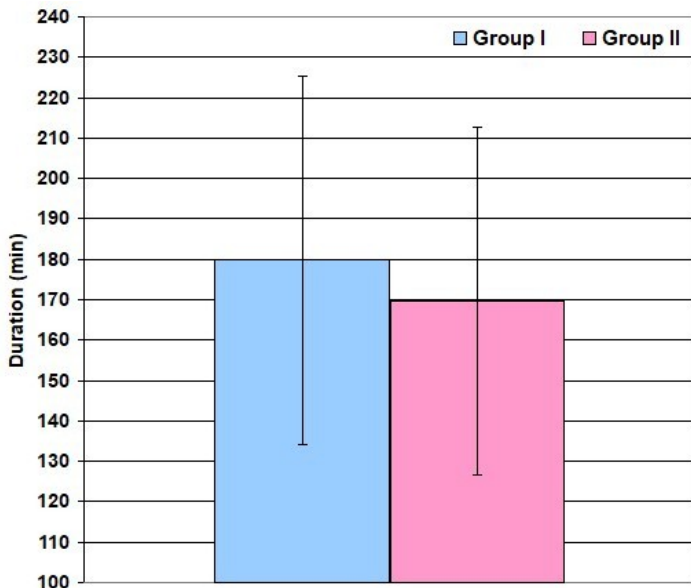


Fig. (2): Mean (\pm SD) of duration of the second stage of labor

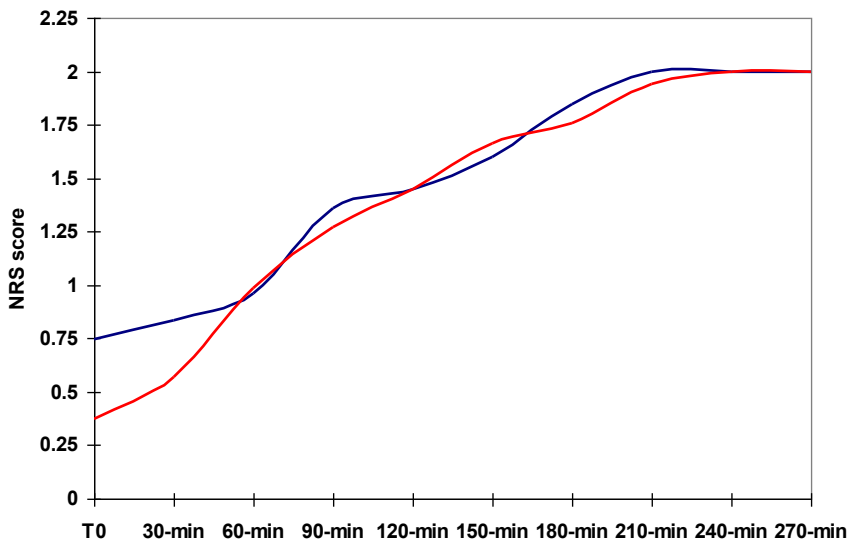


Fig. (3): Mean of NRS scores determined during the duration from 30-min after epidural injection of the test dose till end of the second stage of labor

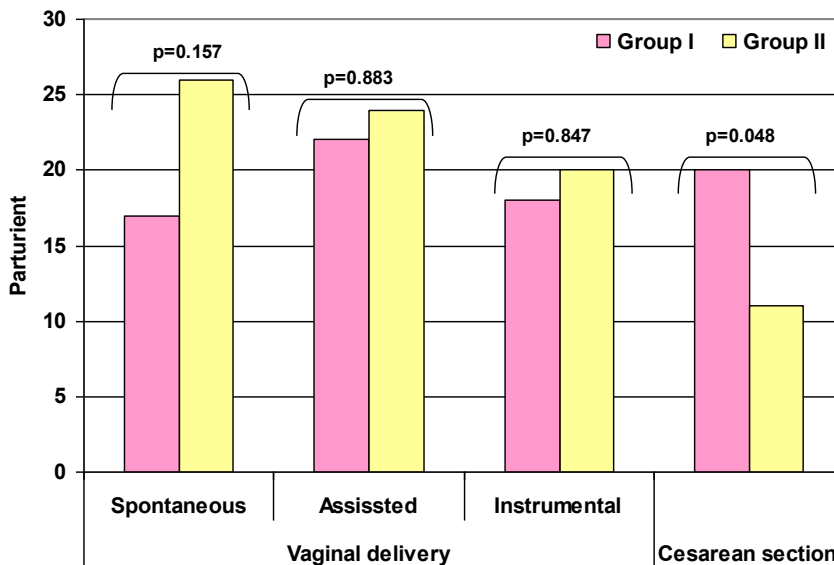


Fig. (4): Distribution of studied parturient according to mode of delivery

DISCUSSION

The obtained results showed non-significant differences between both epidural techniques as regards labor pain scorings throughout the 2nd stage of labor, and the duration of analgesia. These results indicated the efficacy of both techniques of epidural labor analgesia and their appropriateness to provide an efficient painless labor especially for primigravidas who had long 2nd stage and almost exaggerated pain secondary to apprehension. In line with these results, Gizzo et al., (2014) reported no significant differences among all schemes for administration of neuraxial analgesia that could be considered as the gold standard to achieve labor pain relief. Also, Tien et al., (2016) documented that either of continuous infusion or intermittent bolus epidural regimen

showed non-significant difference regarding local anesthetic consumption, sensory and motor blockade. Thereafter, Sng et al., (2018) provided evidence that automated mandatory bolus epidural labor analgesia is similar to continuous basal infusion for most measured outcomes, but it is beneficial for decreasing the risk of breakthrough pain and amount of local anesthetic needed.

In support of the efficacy of epidural labor analgesia, irrespective of technique of administration, Ghaly et al., (2018) documented the efficacy of epidural labor analgesia using continuous lumbar epidural catheter infusion in a parturient that underwent resection of an L1-L3 intramedullary ependymoma 8 years ago. Also, Satomi et al., (2018) reported that programmed intermittent epidural bolus was better than continu-

ous epidural infusion for postoperative analgesia after open gynecological surgery.

The current study intended to include women in labor with intact membrane and cervical dilation of 3-4 cm. The inclusion of women in active labor allowed to spare induction of labor which is recently documented by Kjerulff et al., (2017) to be associated with high CS rate (35.9% vs. 18.9%) than spontaneous labor. Also, Rota et al., (2018) documented that admission of parturient in the latent phase of labor increases the need for intrapartum interventions, which increase the probability of CS.

During the course of the 2nd stage of labor, 42.4% of studied women required oxytocin augmentation to increase the strength of uterine contraction to allow progress of labor and this allowed 29.1% of parturient to have assisted VD and was considered as another factor aided to spare CS which was required for 19.6% of parturient. Such rate of shift to CS was in line with that reported by Kjerulff et al., (2017) and Seijmonsbergen-Schermers et al., (2018) who reported CS rate of 18.9% and 13-15%, respectively in women received epidural analgesia for labor pain. Moreover, Rossen et al., (2018) reported that oxytocin augmentation reduced the risk of CS in nulliparous women with epidural analgesia and spontaneous onset of labor.

Parturient who received IEB showed significantly lower frequency of the need for augmentation, had significantly shorter duration of the 2nd stage of labor and significantly lower incidence of operative delivery in comparison to

parturient who received CEI and this could be attributed to the lesser degree of motor blockade that allowed better uterine contraction that allowed higher frequency of spontaneous and assisted vaginal delivery. In line with these findings, Bullingham et al., (2018) in a large-scale study documented that IEB for labor pain resulted in significantly fewer patients with motor block and shorter 2nd stage of labor for primiparous women. The frequency of instrumental VD was 27.2% and these parturient were mainly in group I despite of the non-significant difference. The reported figures for mode of delivery with epidural labor analgesia go in hand with Kesavan et al., (2018) who reported normal VD in 58.3%, instrumental VD in 23.3% and CR rate of 18.4% of women had lumbar epidural labor analgesia and concluded that epidural analgesia provides optimal neonatal outcome, labor analgesia, and labor outcome. However, the reported figure for instrumental VD was superior to that (35%) reported by Anwar et al., (2015).

About 85% of studied were most satisfied-to-satisfied by the applied analgesic procedure with significantly higher frequency of satisfied among those of group II in comparison to group I. Similarly, Anim-Somuah et al., (2018) assessed the effectiveness and safety of all types of epidural analgesia on the mother and the baby in comparison to non-epidural labor pain relief and concluded that epidural analgesia reduced labor pain more effective with increased maternal satisfaction than non-epidural methods. Also, Sng et al., (2018) assured that automated mandatory bolus epidural labor analgesia improved maternal satisfaction by labor analgesia than automat-

ed mandatory bolus. Moreover, Tan et al., (2018) in a large-scale multicenter study in Singapore, found 32.2% were very satisfied, 35.9% were satisfied, but 31.8% were not satisfied by neuroaxial labor analgesia.

CONCLUSION

Epidural labor analgesia is effective, safe and appropriate modality for women in active labor especially primipara. Both intermittent epidural boluses (IEP) and continuous epidural infusion for (CEI) provided analgesia of non-significant difference. However, IEP was superior to CEI for provision of less motor block, higher spontaneous and assisted VD, shorter 2nd stage and lower CS rate.

Limitation

The study was limited for lack of a group receiving intravenous labor analgesia relief to establish the advantages of epidural labor analgesia.

REFERENCES

1. **Akadri, A.A.; Odelola, O.I. (2018):** Labour pain perception: experiences of Nigerian mothers. *Pan Afr Med J.* 23; 30:288.
2. **Anim-Somuah, M.; Smyth, R.; Cyna, A.; Cuthbert, A. (2018):** Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database Syst Rev.* 21; 5 (5):CD000331.
3. **Anwar, S.; Anwar, M.; Ahmad, S. (2015):** Effect of epidural analgesia on labor and its outcomes. *J Ayub Med Coll Abbottabad.* 27(1):146-50.
4. **Boyle, R. (1993):** Caesarean section anaesthesia and the Apgar score. *Aust N Z J Obstet Gynaecol.* 1993 Aug; 33 (3):282-4.
5. **Breen, T.; Shapiro, T.; Glass, B.; Foster-Payne, D.; Oriol, N. (1993):** Epidural anesthesia for labor in an ambulatory patient. *Anesth Analg.* 77 (5):919-24.
6. **Bullingham, A.; Liang, S.; Edmonds, E.; Mathur, S.; Sharma, S. (2018):** Continuous epidural infusion vs programmed intermittent epidural bolus for labour analgesia: a prospective, controlled, before-and-after cohort study of labour outcomes. *Br J Anaesth.* 121 (2):432-437.
7. **Fairbank, J.C.; Couper, J.; Davies, J.B.; O'Brien, J.P. (1980):** The Oswestry low back pain disability questionnaire. *Physiotherapy,* 66(8):271-273.
8. **Fairbank, J.C.; Pynsent, P.B. (2000):** The Oswestry disability index. *Spine,* 25(22):2940-53.
9. **Ferrer, L.; Romero, D.; Vásquez, O.; Matute, E.; Velde, M. (2017):** Effect of programmed intermittent epidural boluses and continuous epidural infusion on labor analgesia and obstetric outcomes: a randomized controlled trial. *Arch Gynecol Obstet.* 296(5):915-922.
10. **Ghaly, R.; Tverdohleb, T.; Candido, K.; Knezevic, N. (2018):** Lumbar epidural analgesia for labor in a parturient with a history of surgery for lumbar intradural ependymoma: Literature review and case presentation. *Surg Neurol Int.* 23; 9: 211.
11. **Gizzo, S.; Noventa, M.; Fagherazzi, S.; Lamparelli, L.; Ancona, E.; Di Gangi, S.; Saccardi, C.; D'Antona, D.; Nardelli, G. (2014):** Update on best available options in ob-

stetrics anaesthesia: perinatal outcomes, side effects and maternal satisfaction. Fifteen years systematic literature review. *Arch Gynecol Obstet.* 2014 Jul; 290(1):21-34.

12. Grant, E.; Tao, W.; Craig, M.; McIntire, D.; Leveno, K. (2015): Neuraxial analgesia effects on labour progression: facts, fallacies, uncertainties and the future. *BJOG.* 122(3):288-93.

13. Heesen, M.; Klimek, M. (2017): Obstetric analgesia - update 2016: *J Perinat Med.* 1; 45(3):281-289.

14. Kesavan, R.; Rajan, S.; Kumar, L. (2018): Effect and Safety of Labor Epidural Analgesia with Intermittent Boluses of 0.1% Bupivacaine with Fentanyl on Fetal and Maternal Outcomes and Well-being. *Anesth Essays Res.* 12(4):769-773.

15. Koridze, S.H.; Kintraia, N.; Machavariani, P. (2015): Cesarean section - higher rate and higher challenges. *Georgian Med News.*; (246):13-7.

16. Kranke, P.; Annecke, T.; Bremerich, D.; Chappell, D.; Girard, T.; Gogarten, W.; Hanß, R.; Kaufner, L.; Neuhaus, S.; Ninke, T.; Standl, T.; Weber, S.; Jeltling, Y.; Volk, T. (2017): [Update in Obstetric Anesthesia - Tried and Trusted Methods, Controversies and New Perspectives]. *Anesthesiol Intensivmed Notfallmed Schmerzther.* 52(11-12):815-826.

17. Rossen, J.; Klungsoyr, K.; Albrechtsen, S.; Løkkegård, E.; Rasmussen, S.; Bergholt, T.; Skjeldestad, F. (2018): Can oxytocin augmentation modify the risk of epidural analgesia by maternal age in cesarean sections? *Acta*

Obstet Gynecol Scand. 97(7):872-879.

18. Rota, A.; Antolini, L.; Colciago, E.; Nespoli, A.; Borrelli, S.; Fumagalli, S. (2018): Timing of hospital admission in labour: latent versus active phase, mode of birth and intrapartum interventions. A correlational study. *Women Birth.* 31(4):313-318.

19. Satomi, S.; Kakuta, N.; Murakami, C.; Sakai, Y.; Tanaka, K.; Tsutsumi, Y. (2018): The Efficacy of Programmed Intermittent Epidural Bolus for Postoperative Analgesia after Open Gynecological Surgery: A Randomized Double-Blinded Study. *Biomed Res Int.* 15; 2018:6297247.

20. Seijmonsbergen-Schermer, A.; Zondag, D.; Nieuwenhuijze, M.; Van den Akker, T.; Verhoeven, C.; Geerts, C.; Schellevis, F.; De Jonge, A. (2018): Regional variations in childbirth interventions in the Netherlands: a nationwide explorative study. *BMC Pregnancy Childbirth.* 1; 18 (1):192.

21. Sharma, M.; Dhungel, S.; Niroula, S.; Karki, M. (2018): Knowledge and Acceptance of Labour Analgesia in Pregnant Women. *J Nepal Health Res Counc.* 30; 16(3):302-306.

22. Sng, B.; Leong, W.; Zeng, Y.; Siddiqui, F.; Assam, P.; Lim, Y.; Chan, E.; Sia, A. (2014): Early versus late initiation of epidural analgesia for labour. *Cochrane Database Syst Rev.* 9; (10):CD007238.

23. Sng, B.; Sia, A. (2017): Maintenance of epidural labour analgesia: The old, the new and the future. *Best Pract Res Clin Anaesthesiol.*; 31(1):15-22.

- 24. Sng, B.; Zeng, Y.; Souza, N.; Leong, W.; Oh, T.; Siddiqui, F.; Assam, P.; Han, N.; Chan, E.; Sia, A. (2018):** Automated mandatory bolus versus basal infusion for maintenance of epidural analgesia in labour. *Cochrane Database Syst Rev.* 17; 5(5):CD011344.
- 25. Tan, D.; Sultana, R.; Han, N.; Sia, A.; Sng, B. (2018):** Investigating determinants for patient satisfaction in women receiving epidural analgesia for labour pain: a retrospective cohort study. *BMC Anesthesiol.* 9; 18(1):50.
- 26. Tien, M.; Allen, T.; Mauritz, A.; Habib, A.S. (2016):** A retrospective comparison of programmed intermittent epidural bolus with continuous epidural infusion for maintenance of labor analgesia. *Curr Med Res Opin.* 32(8):1435-40.
- 27. Watcha, M.F.; White, P.F. (1992):** Postoperative nausea and vomiting. Its etiology, treatment, and prevention. *Anesthesiology*, 77: 162-84.
- 28. Wilson, M.; MacArthur, C.; Smith, F.; Homer, L.; Handley, K.; Daniels, J.; RESPITE Collaborative Group (2016):** The RESPITE trial: remifentanyl intravenously administered patient-controlled analgesia (PCA) versus pethidine intramuscular injection for pain relief in labour: study protocol for a randomised controlled trial. *Trials.* 12; 17(1):591.
- 29. Zakerihamidi, M.; Roudsari, R.; Khoei, E. (2015):** Vaginal Delivery vs. Cesarean Section: A Focused Ethnographic Study of Women's Perceptions in The North of Iran. *Int J Community Based Nurs Midwifery.* 3(1):39-50.

حقن جرعات متقطعة من الروبيفاكين والسوفنتانيل فوق الجافية توفر تحكماً أفضل في آلام المخاض وتحسن من نتائجه مقارنة بالتسريب المستمر للمزيج فوق الجافية

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الأهداف:

تقييم فعالية التسكين بالحقن فوق الأم الجافية وآثاره علي نتائج الحمل عند النساء البكاري.

المرضى والوسائل:

قسمت مائة وثمانين وخمسين امرأة بكر في حالة المخاض إلى مجموعتين: مجموعة (١) أعطين تسريب مستمر فوق الأم الجافية، ومجموعة (٢) أعطين جرعات متقطعة من مزيج من الروبيفاكين (٠.١٥%) والسوفنتانيل بجرعة ٠.٢ جرام لكل مل. قُيِّمت فعالية الحقن بواسطة مقياس التدرج الرقمي للألم ومقياس بروماج للإحساس العضلي. سُجِّل أيضاً كلاً من معدل الحاجة إلى تعزيز المخاض، طول مدة المرحلة الثانية من الولادة، طريقة الولادة والنتائج الجنينية وفقاً لما أصدره مقياس أبار، الأعراض الجانبية المتعلقة بالدواء، ودرجة إرضاء المرضى.

النتائج:

أظهر متوسط نواتج مقياس التدرج الرقمي للألم اختلاف ضئيل بين مرضى كلتا المجموعتين. كان متوسط مدة المرحلة الثانية للولادة أقصر بدرجة ذات دلالة احصائية في المجموعة الثانية ($P=0.021$)، وكان معدل الحاجة لتعزيز المخاض والجراحة القيصرية أقل بفارق ذو دلالة احصائية في المجموعة الثانية. سجلت المجموعة الثانية لحديثي الولادة مجموع ١٠ نقاط في مقياس أبار، كما حصلت أيضاً على نتائج جيدة، وكان معدل حدوث الغثيان أقل بفارق ذو دلالة احصائية بين لدي نساء المجموعة الثانية. أعربت ثلاث وثمانون (٥٢.٥%) سيدة عن راحتها عن عملية التسكين بشدة،

شعرت واحد وخمسون (32.3%) سيدة بالرضاء حيالها، ثماني عشرة (11.4%) سيدة وجدن أن عملية التسكين جرت على ما يرام، بينما ست سيدات (3.8%) وجدوا أن عملية التسكين كانت غير مريحة. كانت النساء التي أبدت راحتهم عن عملية التسكين بشدة و الذين وجدوا العملية مرضية أعلى بشكل كبير في المجموعة الثانية عند مقارنتها بالمجموعة الأولى.

الخلاصة:

تعد عملية التسكين لآلام المخاض بواسطة الحقن فوق الأم الجافية وسيلة فعالة، آمنة، وملائمة للنساء في حالة المخاض النشط، خاصة عند النساء البكر. كان الاختلاف في قوة تسكين آلام المخاض بين أسلوبَي التعاطي ضئيلاً. وعلى الرغم من ذلك كان اعطاء جرعات متقطعة من مزيج أفضل في إحداث إحصار أقل للعضلات، في معدلات الولادة الطبيعية التلقائية مع قصر مدة المرحلة الثانية للولادة وانخفاض في معدل اللجوء إلى الجراحة القيصرية.

٢٣. المجلة المصرية للعلوم الطبية ٣٩ (٢) ديسمبر ٢٠١٨ : ٩٠٩-٩٢٥.