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A COMPARATIVE STUDY OF POST OPERATIVE PAIN RELIEF BY CONTINUOUS EPIDURAL INFUSION OF BUPIVACAINE WITH FENTANYL VS ROPIVACAINE WITH FENTANYL BY USING PORTABLE ELASTOMERIC INFUSION PUMP

Anaesthesiology

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ABSTRACT

Local anaesthetics and opiod combination in epidural infusion provides superior postoperative analgesia,decrease the dose of local anaesthetics and reduces side effects.Bupivacaine and Ropivacaine are the commonly used local anaesthetics,because of their differential blockade of sensory fibres rather than motor fibres.The newer portable elastomeric infusion pump can be used give epidural infusion.The present study was designed to compare the postoperative pain relief by continuous epidural infusion of Bupivacaine with Fentanyl and Ropivacaine with Fentanyl using Elastomeric pump.METHODS :Fifty patients were grouped into two groups of twenty five each in this randomised,prospective study.patients received 60 ml of 0.5% Bupivacaine+ 10 ml of Fentanyl (100 mcg)+180 ml of normal saline in 250 ml of infusion pump or 60 ml of 0.5% Ropivacaine+ 10 ml of Fentanyl (100 mcg)+180 ml of normal saline in 250 ml of infusion pump.Postoperative Pulse Rate,Blood Pressure,Arterial oxygen saturation,Respiratory Rate,Pain score,Sedation score,Dose of Adjuvants needed and Complications were observed.RESULTS : Mean post operative pain score in the Bupivacaine with Fentanyl group was 2 ± 0.29 and have stable hemodynamics compared to Ropivacaine with Fentanyl group (2.17 ± 0.706) CONCLUSION : By using portable,elastomeric epidural infusion pump for the purpose of postoperative analgesia by continuous epidural infusion of Bupivacaine with Fentanyl provides superior analgesia compared to Ropivacaine with Fentanyl

KEYWORDS:

INTRODUCTION :

Successful outcome was the most desirable end point of any surgical procedure.Therefore anaesthetic and analgesic techniques should aim not only to provide optimal condition for surgery,but also reduce post operative morbidity and mortality thus improving the outcome.The stress response to surgery results in disturbances in body homeostasis.Many beneficial effects of continuous epidural analgesia during postoperative period includes effective pain relief,fast recovery of gut function,reduction in postoperative thrombo-embolic and cardio respiratory complications.The choice of local anaesthetics for continuous epidural infusion varies, because of differential sensory blockade with minimal impairment of motor function local anaesthetics like bupivacaine, ropivacaine, levobupivacaine were commonly used.Using combination of local anaesthetics and opiods in epidural infusion is advantageous over infusion using local anaesthetics or opiods alone. Epidural infusion were usually given by intermittent boluses or by using syringe pumps or electronic epidural infusion pumps.The newer portable elastomeric infusion pumps were safe,reliable,economic and easy to use.They operate by the action of elastomeric balloon and the drug was infused in a constant preset flow rate.The present study was designed to compare the postoperative pain relief by continuous epidural infusion of Bupivacaine with Fentanyl and Ropivacaine with Fentanyl using portable elastomeric infusion pump. Epidural infusion pump used in this study was DOSIFUSER portable,elastomeric pump with the capacity of 250 ml with the fixed infusion rate of 5.2 ml /hour.

METHODOLOGY:

This was a randomised,prospective study.simple randomised sampling was done by computer generated random numbers.Fifty patients were studied.ASA patients between 20-60 years of both sexes undergoing upper and middle abdominal surgery were included in the study.Patients with significant co-existing diseases,long term analgesic use and contraindication to regional anaesthesia such as local infection and bleeding diathesis were excluded from the study.

After obtaining Institutional research and Ethical committee approval and written informed consent,the patients were randomly allocated into two groups.

Group BF – patients received 60 ml of 0.5% Bupivacaine+ 10 ml of Fentanyl (100 mcg)+180 ml of normal saline in 250 ml of infusion pump.

Group RF - patients received 60 ml of 0.5% Ropivacaine+ 10 ml of Fentanyl (100 mcg)+180 ml of normal saline in 250 ml of infusion pump.

In the operating theatre the Boyles apparatus, emergency drugs and airway devices were kept ready. Patients were shifted to operating table. NIBP, ECG, Pulse oximetry were connected to the patients.Pre operative baseline systolic and diastolic blood pressure, pulse rate, oxygen saturation were recorded. Patients were cannulated with 18 G IV cannula and IV fluid RL started. The patients were placed in right lateral position. The skin over the back was prepared with antiseptic solution and draped with sterile towel. After infiltrating skin and subcutaneous tissue with local anaesthetics, 17 G Tuhoy needle inserted either in T 12-L 1 , L 1-L 2 or L 2-L 3 space according to nature of the study. Epidural space was located with loss of resistance to air and 19 G epidural catheter inserted and placed at depth of 5 cm after giving test dose of 3 ml of 2 % lignocaine with 1:200000 dilution of adrenaline.

All patients in both groups received General anaesthesia as intraoperative anaesthesia. General anaesthetic techniques was similar in both the groups.

Intraoperatively all patients were managed depending upon the patients preoperative status and type of the surgery. IV fluids & Blood transfusions were given according to hemodynamic monitoring and blood loss.

30 minutes before the end of the surgery epidural infusion was started and time was noted.

At the end of surgery neuro muscular blockade was antagonised and tracheal extubation was done provided the patients were conscious,hemodynamically stable and maintained adequate ventilation.

All the patients were shifted to post operative surgical ward.Each patient's post operative course was followed for the 48 hours since activation of continuous epidural infusion.

Patients Pulse rate,Blood pressure,Respiratory rate,SpO2,pain score using visual analogue scale,Sedation score using Ramsay scale,Motor block using Bromage scale and any complications were noted 8 th hourly.

Break through pain was managed with inj.Tramadol 50 mg IV.After 48 hours infusion pumps were stopped and epidural catheter was removed.

RESULTS :

RESULTS : By statistical analysis of two groups the age distribution in both groups was statistically not significant with a p value of 0.8.When comparing the weight of the patient in two groups it was statistically not significant with p value 0.78.There was no statistically significant differences between the two groups as regards to sex distribution 0.89.

Mean preoperative pulse rate in BF group was 81 + 5 and post operative pulse rate was 81 ± 4.25 . The difference between two was statistically not significant (p> 0.54).Mean preoperative pulse rate in RF group was 80 ± 6.29 and post operative pulse rate was 92.9 ± 8.36. The difference between two was statistically significant (p < 0.0001). Mean preoperative systolic BP in BF group was 121 ± 3.04 and mean post operative blood pressure was 123 ± 2.18 . The difference between two was statistically not significant (p 0.484). Mean preoperative systolic BP in RF group was 121.54 ± 4.51 and mean post operative systolic BP was 127.68 ± 3.68. The difference between two was statistically significant with p value of < 0.0001. Mean diastolic BP in BF group was 70 ± 4.24 and mean post operative diastolic BP was 71 ± 4.62 . The difference between two was statistically not significant with a p value 0.429. Mean diastolic BP in RF group was 77.12 ± 5.83 and mean post operative diastolic BP was 82.21 ± 3.20 . The difference between two was statistically significant with p value < 0.0004. Mean post operative pain score in the BF group was 2 ± 0.29 and in RF group it was 2.17 ± 0.706. The difference between two was statistically significant with p value of 0.0204. Adjuvants are needed 6 times in BF group.In RF group adjuvants was used in 22 times. Post operative sedation score was equal in both groups.Post operative respiratory rate and Sp02 was equal in both group. No significant complication between two groups.

DISCUSSION : [1]A local anaesthetics- opioid combination provides superior post operative analgesia,improved dynamic pain relief,limits regression of sensory block,decreases the doses of local anaesthetics and decrease the incidence of side effects.

Dosifuser – portable,elastomeric epidural infusion pumps is an economical and more reliable mode of delivering the drugs.it was available in various volumes and variable flow rates.it provides continuous delivery of drug according to the flow rate for fixed hours. Designed for a continuous intravenous and subcutaneous and epidural infusion of drugs for use in postoperative pain relief,chemotherapy and patient controlled analgesia.

Fernandes et al [2]have done a study to compare the analgesic efficacy and degree of motor blockade achieved with epidural infusion of 0.625 % Bupivacaine (group B) Vs 0.1 % Ropivacaine (Group R) both with Fentanyl 2 pg /ml in labouring patients. A prospective double blind study was performed in 98 ASA physical status I — Il parturient who were divided randomly in to 2 group to receive either Bupivacaine and Ropivacaine after catheter location has been tested with an initial bolus of lidocaine and fentanyl . Infusion rate was 15 ml/ hour in every case. When pain was perceived, 5 ml bolus of assigned epidural analgesics were administered every 10 min until analgesia was achieved.They recorded pain intensity, level of sensory block, degree of motor block, haemodynamic variables, secondary effects, mode of delivery, neonatal out come, patient satisfaction. There were no statistically significant difference in any of the factors analysed. Highly effective analgesia was achieved in both groups with a small incidence of motor block. These finding suggested that bupivacaine may be more potent than ropivacaine.

Scott DA et al[3] have done a study on post operative analgesia using epidural infusion of fentanyl with bupivacaine — A prospective analysis of 1014 patients.They observed that post operative epidural fentanyl / bupivacaine effective and can be managed readily in general wards with minimal complications provided that appropriate observation are performed.

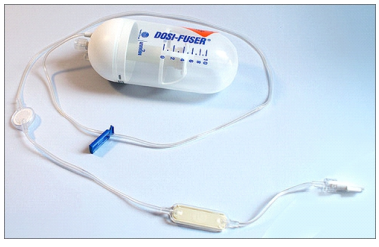
Zaric D, Nydahl PA et al,[4] have done a study to investigate the response of sensory and motor block during continuous epidural infusion of 0.1%,0.2% or 0.3 % ropivacaine in volunteers in a double blinded manner. Bupivacaine 0.25 % and isotonic saline were used as reference and control respectively. Each treatment group consisted of eight healthy men. After a bolus dose of 10 ml at the 1-2-1.3 interspace, solution in question was infused at 10 mljhr for 21 hours. Sensory block was evaluated by pin prick, light touch and thermotcst mcthods. Motor block was measured by the bromage scale. Mobilization of the subjects was attempted through out the investigation. The number of blocked dermatomes with 0.1 % ropivacaine was significantly smaller than with the other test solutions. Motor block was minimal with 0.1% ropivacaine. It was moderate with 0.2 and 0.3 % ropivacaine and most intense with 025 % bupivacaine. The regression phase was significantly shorter with all three concentration of ropivacaine than with bupivacaine.

CONCLUSION : By using portable,elastomeric epidural infusion pump for the purpose of postoperative analgesia by continuous epidural infusion of Bupivacaine with Fentanyl provides superior analgesia compared to Ropivacaine with Fentanyl.

FACTORS	BUPIVACAINE-FENTANYL	ROPIVACAINE-FENTANYL
AGE	43 +/- 13	42+/-10
HEIGHT	164 +/- 6	160 +/-6.4
WEIGHT	64.7 +/- 5	61.28 +/- 7

GROUP	PRE OPERATIVE	POST OPERATIVE	P VALUE
BUPIVACAINE-FENTANYL	81 +/- 5	81 +/- 4.2	0.54
ROPIVACAINE-FENTANYL	80 +/- 6.29	92.9 +/- 8.36	<0.0001

	BUPIVACAINE-FENTANYL	ROPIVACAINE-FENTANYL		
	SYSTOLIC	DIASTOLIC	SYSTOLIC	DIASTOLIC
PRE OP	121 +/- 3.04	70 +/- 4.24	121.52 +/- 4.51	77.1 +/- 5.83
POST OP	123 +/- 2.18	71 +/- 4.62	127.68 +/- 3.68	82.21 +/- 3.20
PVALUE	0.484	0.429	<0.0001	<0.0004
GROUP	PAIN SCORE			
BUPIVACAINE-FENTANYL	2 +/- 0.29			
ROPIVACAINE-FENTANYL	2.17 +/- 0.706			
P VALUE	0.0204			



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