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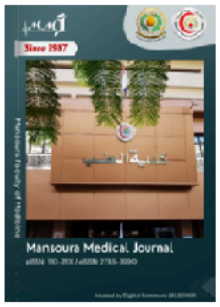

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ILIOINGUINAL ILIOHYPOGASTRIC NERVE BLOCKS FOR POST-OPERATIVE PAIN RELIEF IN PEDIATRIC PATIENT SUBMITTED FOR GROIN SURGERY

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ABSTRACT

Background : evaluation of effectiveness, postoperative analgesia hemodynamic effects, recovery profiles and degree of satisfaction of both parents and surgeons to ilioinguinal and iliohypogastric nerve blocks performed with local anaesthtics. bupivacaine alone and with fentanyl.

Methods : sixty patients. undergoing groin surgery using sevoflurane nitrous oxide anaesthesia were included . Patients were randomly allocated into 3 equal groups (n =15). Group p received normal saline at the dose of 0.3- 0.4 ml/kg for local nerve block (placebo group). Group B received 0.25%. bupivacaine at the dose of 0.3- 0.4 ml/kg as a local anaesthetic for the nerve block . Group BF received 0.25% bupivacaing at the dose of 0.3-0.4ml/kg and fentanyl at the dose of 1 μg kg as local anaesthetic for the nerve block . Pain was evaluated by the CHEOPS pain score, "Modified Children's Hospital Eastern Ontario Pain. Score" . Recovery cariteria were assessed by Modified Aldrete Recovery Score.

Results : there was significant prolongation in duration of analgesia in group BF (348 ± 15 min) and group B (327 ± 18 min) than placebo group .

the total number of fentanyl doses significantly decreased in group (BF) 6 doses than group (B) 18 doses and placebo (38) doses . the modified CHEOPS scor showed significant decrease in group BF. and group B than placebo group. No signifycant changes in hemody namics between all groups.

Conclusion : It could be concluded that the addition of fentanyl to bupivacain for the nerve block improves the postoperative analgesia and decreases requirement for post -operatives analgesics

Key words : bupivacaine; fentanyl; Local nerve block; postoperative analgesia .

For years pediatric pain management has been practiced without clear rational use of analgesic therapy . Recent improvement understanding of anatomical and physiological pathway of pain perception, opioids and local anaesthetics phalmacology in infants and children has led to the development of formal analgesic regimens for the management of pain.(1) In recent years, interest has increased towards prepheral nerve block for surgery and post- operative analgesia.(2) Ilioinguinal and iliohypogastric nerve blocks are commonly used in children to provide analgesia after surgery in the groin .(3)

Local nerve blocks have , resulted in shorter recovery time , decreased anaesthesia-related complications and better postoperative pain management and decrease side effects related opioids e.g respiratory depression, urine retention . nusea and vomiting .(4)

Bupivacaine is a long acting local anaesthetic . It's the most commonly reported local anaesthetic for pediatric regional anaesthesia. Opiates are widely known to have an antinociceptive effect at central and or spinal cord level in addition to prepheral opioid recptors (5) especially fentanyl that provides good intra- operative analgesia with fewer side effects.(6)

This study was designed to evalu-

ate the effectiveness, of the post-operative analgesia, hemodynamic effects and recovery profiles of ilioinguinal and iliohypogastric nerve blocks performed with the local anaesthetic bupivacaine alone , and with addition of fentanyl.

Patients and methods : this prospective randomized double blind study was performed on 60 patients of either sex, AsA physical status I or II aged 2-8 years. The protocol was approved by our local Ethics committee, and a written informed consent was secured from the patient's parents .

Exclusion criteria were local infection -systemic infection -liver diseases -renal diseases -endocrinal disorders. All patients received a standard an aesthetic drugs including thiopental sodium at a dose 5 mg/ kg Iv . endotrachel intubation with appropriate size was facilitated using atracuium at adose of 0.3-0.6mg/kg. IV. Anesthesia was maintained with oxygen in air at the ratio of 1:2 and sevoflurane was adjusted as needed to maintain appropriate level of anaesthesia. Muscle relaxant was maintained using atracurium at a dose of 0.1 - 0.2 mg / kg to facililate volume controlled ventilation with T.V. 7-12 ml / kg to maintain endtidal carbondioxide around 30- 35 mm Hg. Patients were randomly allocated into 3 equal groups (20 pt each) according to the drug used for nerve. block.

GP : placebo group : received 0.3-0.4 ml/kg of 0.9 % saline

GB : received bupivacaine only 0.25% at the dose of 0.3 -0.4 ml/kg

GBF : received bupivacaine 0.25% 0.3-0.4 ml/kg and fentanyl μg/ kg for the nerve block.

All patients were placed in the dorsal recumbent position after the induction of general anaesthesia . Ilioinguinal and iliohypogastric nerve blocks were performed under complete aseptic condition using 22G. needle. the solution was injected at the point of union of lateral one fourth with the medial 3/4 of line joining the anterior superior iliac spine (ASIS) to umbilicus. The short beveled needle

was inserted at a 45 - 60 degree angle pointing to the midpoint of the inginal ligament until superficial layer of external oblique muscle was pierced with a clearly identifiable cracks, then a single injection of the solution was made in a fan shaped manner .

Residual neuromuscular block was reversed at the end of the procedure with atropine 0.02 mg / kg and neostigmine 0.04 mg /kg ECG. non-invasive ABP, pulse oximeter and endtidal CO2 were monitored 5min before induction of GA, immediately after induction of GA, immediately after the nerve block , 15 min interval up to the end of surgery. Monitoring was continued post operatively in PACU every lhour for the first 6 hours, then every 6 hs in the following 24 h. After surgery postoperative analgesia was assessed using modified CHEOPS pain score)

Any postoperative adverse effects were recordede.g nusea- vomiting - shivering and respiratory depression. The duration of analgesia was recorded as the time from the injection until the patients request for additional analgesia and the number of fentanyl doses were recorded in each group

- Any post- operative complication as nusea- vomiting - hallucination- and respiratory depression were recorded

STATISTICAL ANALYSIS

* parametric data were expressed in mean ±SD paired test was used for comparison within group while one way anova test was used for comparison between groups

* non parametric data were presented in median and range. Paired test was used for comparison with in group while Chi square test was used for comparison between groups $P<0.05$ was considered to be statistically significant

RESULTS

Demographic data including patients height - weight and age were comparable with no significant difference among the groups (table1)

There were no significant changes

in the hemodynamics including HR-MABP- non invasive arterial cxygen saturation or endtidal carbon dioxide among the groups. Regarding the duration of post -operative analgesia was longer in GBF (348.3 ± 15.2) than GB (327 ±18) but of no statistical significance there was significant increase in duration of analgesia in. GBF - GB comparing with GP which had no analgesia (table2) .Modified CHEOPS score values showed a significant decrease in GBF and GB compared to GP. (table 3) However there was no significant changes in GBF compared with GB. Modified Aldrete recorery score was of no significant differences bet ween the three groups. On the other hand there was significant difference between GBF - GB - GP regarding the surgeon's and parent's satisfaction, where the surgeons and parents are more satisfied in GBF and GB more than GP

Table I: Modified Children's Hospital Eastern Ontariopoin Scale (7)

	0	1	2
Cry	No cry	Crying , Moaning	Scream
Facial	Smiling	Composed (neural)	Grimace
Verbal	Taking about other things (positive)	Not taking	Pain
Torso	Neutral	Shifting , Tense, . Upright	Restrained
Legs	Neutral	Kick, squirm , drown- up	Restrained

tabl II: and recovery score was assessed by Modified Aldrete Recovery Score(**8**)

	0	1	2
Activity (voluntary or on demand)	Unable to move	Moves 2 limbs	Moves all limbs
Respiration	Apnoeic	Shallow or limited	Deep breathin and able to cough
Conciousness	Unresponsive	Responding to stimuli	Fully awake
Circulation	Blood pressure ± 50% of preanesthetic level	Blood pressure ± 20-50% of preanesthetic level	Blood pressure ± 20% of preanesthetic level
Oxygen saturation	SpO <92 %with O2 supplementation	Supplemental O2 required to maintin Sp O2>92%	SpO2 > 92% on room air

Table (1) : Patient's characteristics Data are in mean (± SD)

	GP	GB	GBF
Sex (m/f)	18/2	18/2	19/1
Age (years)	3.2 (±3.3)	4.1(±3.3)	4.5(±2.9)
Weight (Kg)	14.8(± 8.6)	16.3(±6.8)	17(±5)

Table (2) : Duration of analgesia (in minutes) Data are in mean (±SD)

	GP (n= 20)	GB (n=20)	GBF (n=20)
Duration of analgesia (min)	-	**327(±18)***	**348.3(±15.2)***

Level of significant (P< 0.05).

Table (3) : Modified CHEOPS Score . Data are in median (min- max.)

	Immediately postop	1hr postop.	2hr postop	3hr postop	4hr postop	5hr postop	6hr postop	12hr postop	24hr postop
GP	10(6-10)	6(4-10)	6-(4-8)	5(1-8)	4(1-9)	5(1-8)	4(1-8)	4(1-9)	4(1-8)
GB	2(1-3)*	2(1-2)*	1(1-2)*	1(1-3)*	1(1-2)*	2(1-2)*	3(1-4)	3(1-4)	3(1-4)
GBF	2(1-3)*	1(1-2)*	1(1-2)*	1(1-2)*	2(1-3)*	1(1-2)*	1(1-2)*	3(1-3)	3(1-2)

Level of significant (P< 0.05).

DISCUSSION

IL. IH never blocks procedures are widely used local anaesthetic technique for decreasing pain after hernial repair and orchipexy. [9] It provides excellent post-operative analgesia and allow for earlier ambulation and urination with no lower extremity weakness with marked decrease in the complication of neuroaxial block. [10] Bupivacaine a long acting local anaesthetic, is the most commonly reported local anaesthetic for pediatric regional anaesthesia [11] Opiates are widely known to have an antinociceptive effect at central and or spinal cored level in addition to prepheral opioid receptors .[12] more over the fentanyl has pharmacokinetic variables that permit it to stay in the muscle and fat compartments for many hours after a single Iv injection.[13] Schoor etal (2005) [3] and Capdevila etal (2004) [14] proved that IL. IH nerve block are safe effective , hemodynamically and easy to perform and provide adequate analgesia.

In this present study Addition of fentanyl to L . A. for prepheral nerve blocks prolongs the duration of post-operative analgesia and improves the quality of it , and this is in agreement with Nishikawa etal (2000) (15) who proved this by addition of fentanyl to lidocaine for axillary nevre blocks. Tuverkoy etal [16] (1998) suggested that fentanyl produces its action in prolongation of post-operative analgsia by 3 mechanisms . firsty , fentanyl could act on prepheral nervous system . 1ry afferent tissues (dorsal roots) second, fentanyl may diffuse from prepheral nerves to epidural and subarachnoid spaces Third it may poteniate local anaesthetic action via central opioid receptors by the diffusion of the drug to systemic circulation [17]

IN CONCLUSION

The use of both bupivacaine and bupivacaine fentanyl for ilioinguinal liliohypogastric nerve blocks significantly decreased pain scores, consumption of post - operative analgesia, provided hemodynamic stability and prolonged the duration of post - operative analgesia with more satisfaction of surgeons and parents.

REFERENCES

1- GoldmanL (1995) : Complications

in regional anesthesia. pediatr Anesth; 5: 3-9 .

2- **TaboadaM, Roderiguez J Alvarez E (2003) :** peripheral nerve block for surgical and post operative analgesia of the legs- Rev Esp Anestesiol Reanim; 50 : 510-520 .

3- **Schoor A, Boon J , Bosenberg A etal (2005) :** Anatomical considerations of the pediatric ilioinginal iliohypogastric nerve blocks pediatr Anesth; 15: 371-7.

4- **Johr M (2003) :** Regional anesthesia in newborn infants, infants and children , what perquisites must be met ? Anesthesiol Reanim; 28 (3) : 69-73 .

5- **Lipp A, Wood cock J , and Hensman B (2004) :** Leg weakness is complication of ilioinginal nerve block in children . Br J Anesth ; 92: 273-4 .

6- **Andersen F, Nielsen K and Kehlet H (2005) :** Combined ilioinginal block and local infilteration anesthesia for groin hernia repair :adouble blind randomized study. BrJ Anesth; 94(4) 520-3 .

7- **Tarbell SE, Cohen it, Marsh JL. (1992) :** the toddler- pre schooler sopt-operative pain scale : an observational scale for measuring postoperative pain in children aged 1-5 . preliminary report . pain , 1992;50: 273-280.

8- **Aldrete J (1998) :** The postanesthesia recovery score J Clin Anest; 7 : 89-91 .

9- **Splinter V, william M, Bass J etal (1995) :** Regional anesthesia for hernia repair in children : local vs caudal anesthesia . Can J Anesth.

10- **Flanagen L, and Bascon J (1981) :** Herniorrhaphies performed upon outpatients under local anesthe-

sia . Surg Gynecol Obstet; 153:557- 60 .

11- **Casey w, Rice I, Hannallah R etal (1990) :** Acomparison between bupivacaine instillation versus ilioinginal liliohypoastvic nerve blecks for post- operative analgesia following inguinal hernio rrhaphy in children . Anesthesiology; 72 : 637-9 .

12- **Gunter J (2002) :** Benefit and risk of local anesthetics in infants and children. Paeditr Drugs; 4: 649 -72.

13- **Bre nnan L (1999) :** modern day - case anesthesia for children. Br J Aanesth; 83: 90 - 103 .

14- **CapdevilaX and Dadure C (2004) :** perioperative management for one day hospital admission. Regional anesthesia is betterthan rgan general anesthesia. Acata Anesthesiol Belg; 55: 33-6 .

15- **Nishikawa, kohki S , Kanaya etal (200) :** fentanyl improves analgesia but prolons the onset of axillary brachial plexus block by per ipheral mechanism Anesth analg; 91 : 334-7.

16- **Tverskoy , Mark , Braslarsky etal (1998) :** The peripheral effect of fentanyl on post-operative pain. Anesth analg; 87: 1121-4 .

17- **Lakan, Ceyhan A , Bababaham M etal (1999) :** Effect of ilioinginal, iliohypogastric and genitor femoral nerve blocks on post - operative pain after herniorraphy and orchipexy in children. Br J Anesth; 82 : 103 .