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A randomized clinical study to evaluate effect of dexamethasone with levobupivacaine in sciatic nerve block for post-operative pain relief

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Abstract
Background: Pain is an unavoidable experience in postoperative period. If untreated or undertreated may result in increased morbidity as well as the cost because of impairment of quality of life.
Aims and Objectives: To evaluate postoperative analgesic effect and safety of dexamethasone with levobupivacaine in sciatic nerve block for lower limb orthopedic surgeries.
Materials and Methods: Sixty patients of ASA grade I and II undergoing lower limb orthopaedic surgeries were studied in the Department of Anaesthesiology, GR Medical College and JA Group of Hospitals, Gwalior from December 2015 to August 2017. The patients were divided into Group D (n= 30, were given 24 ml of 0.25% levobupivacaine hydrochloride + 1ml (4mg) of dexamethasone), and Group C (n=30, were given 24ml of 0.25% levobupivacaine hydrochloride + 1ml of normal saline). Postoperative analgesia in terms of VAS score, time to first rescue analgesic (duration of analgesia) and side effect or complication were studied in both the group.
Results: Male preponderance was noted in each group (27 in Group D, and 26 in Group C; p=0.749). Mean age of patients in Group D, and Group C was 34.67±13.55, and 38.93±12.54 years respectively (p>0.05). Mean pulse rate (min), SBP (mmHg), DBP (mmHg) and Sp02 (%) were comparable between groups (P>0.05). MAP (mmHg) was significantly high in Group C compared to Group D. Group D had VAS score of 42.83±0.99 at 12 hours and Group C had 49.46±1.132 at 8 hours (p value < 0.001). At 24 hours VAS score of group D and C were 15.67±1.309 and 15.67±1.714 respectively. One patient each in Group D and C experienced nausea and vomiting and one patient in Group C experienced postoperative shivering.
Conclusion: Dexamethasone is a good alternative for post operative pain management along with Levobupivacaine hydrocholoride compared to Levobupivacaine with minimal postoperative complication.

Keywords: orthopaedic surgery, VAS score, first rescue analgesic, dexamethasone

Introduction

Unrelieved postoperative pain may result in clinical and psychological changes that increase morbidity and mortality as well as cost and also impairs the quality of life. Effective and appropriate pain management requires a proactive approach using a variety of treatment modalities [1].

Regional anesthesia is a safe, inexpensive technique with an advantage of prolonged postoperative pain relief. Effective treatment of postoperative pain blunts autonomic, somatic and endocrine responses. It has become common practice to use a multimodal approach for the treatment of postoperative pain, as no single drug has yet been identified which inhibits nociception without associated side effects [2, 3].

Many drugs and adjuvants have been used and research still continues to find out different techniques and drugs that could prolong the duration of regional anesthesia and postoperative pain relief.

Dexamethasone synergizes with local anesthetics on blockage of impulse conduction in nerve fibers. It alters the function of potassium channels in excitable neurons [4]. It occupies the glucocorticoid receptors in the endothelium of cutaneous blood vessels [5].

Hence present study was planned to compare postoperative analgesic effect and safety of dexamethasone in addition to levobupivacaine in lower limb orthopedic surgeries.

Materials and Methods

A prospective study including 60 patients of ASA grade I and II undergoing lower limb orthopaedic surgeries was performed in the Department of Anaesthesiology of GR Medical College and JA Group of Hospitals, Gwalior and Madhya Pradesh.

Patients who were able to provide written informed consent, willing to participate in study, patients scheduled for lower limb orthopaedic surgeries belonging to ASA physical grade I and II, age group between 18 to 65 years of either sex and having weight 50-90 kg and height ≥ 150 cm were included.

Uncooperative patients and those who were not able to understand pain assessment test, history of clinically significant cardiovascular, pulmonary, hepatic, renal, neurological, psychiatric, or metabolic disease, patients who

are unable to understand VAS assessment, patients having severe obesity (BMI > 35 kg/m2), coagulation disorder, on anticoagulants, severe spinal deformity, allergy to local anaesthetic, or any contraindication to spinal anaesthesia, patients with history of drug allergy, drug addict / patient on long term steroid therapy and pregnant patients were excluded from the present study.

Study cohort was divided as Group D (n= 30, were given 24 ml of 0.25% levobupivacaine hydrochloride + 1ml (4mg) of dexamethasone) and Group C (n=30, were given 24ml of 0.25% levobupivacaine hydrochloride + 1ml of normal saline)

Results

Most of the patients were male in both the groups (27 in Group D, and 26 in Group C; p=0.749). Mean age of patients in Group D and Group C was 34.67±13.55 and 38.93±12.54 years respectively (p>0.05).

Table 1: Comparing Intra-operative parameters between groups

Intra-operative Parameters	Group D	Group C	P value
Pulse rate (min)	89.711±13.64	91.519±15.79	NS
SBP (mmHg)	120.085±8.5	118.743±27.60	NS
DBP (mmHg)	76.315±7.34	89.619±7.60	NS
MAP (mmHg)	89.212±9.35	82.694±5.60	NS
Sp02 (%)	98.402±4.26	97.214±7.07	NS

SBP; systolic blood pressure, DBP; diastolic blood pressure, MAP; mean arterial pressure, SpO2; partial pressure of oxygen, NS; not significant, P value of <0.05 is considered as significant

Table 2: Comparing Post-operative parameters between groups

Post-operative Parameters	Group D	Group C	P value
Pulse rate (min)	90.62±16.09	97.94±0.90	NS
SBP (mmHg)	122.11±7.34	111.619±7.60	NS
DBP (mmHg)	90.58±13.96	79.89±5.68	0.01*
MAP (mmHg)	90.62±16.09	97.94±0.90	NS
Sp02 (%)	98.402±4.26	98.214±7.07	NS

*between Group N and Group C, SBP; systolic blood pressure, DBP; diastolic blood pressure, MAP; mean arterial pressure, SpO2; partial pressure of oxygen, NS; not significant, P value of <0.05 is considered as significant

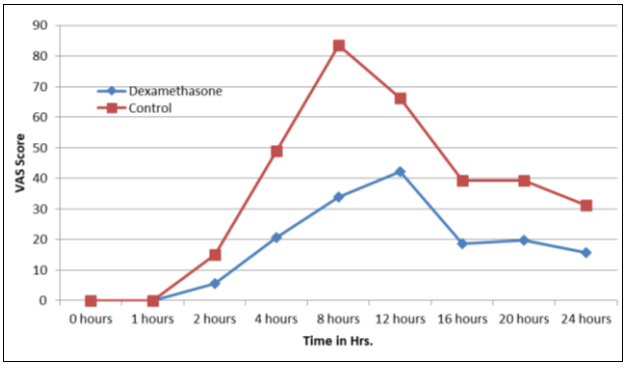

Fig 1: Comparing VAS score at different time interval between groups

Data is expressed as mean, VAS; visual analogue scale,

In Group D and C both only one patient experienced nausea and vomiting. In Group C only one patient experienced postoperative shivering.

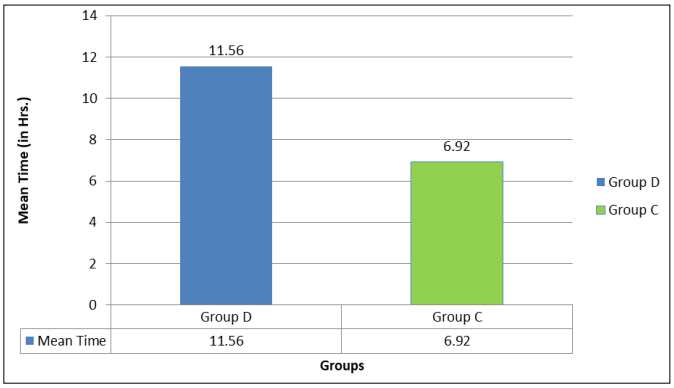

Fig 2: Showing time for first rescue analgesia between group

Discussion

Pain is a known cause of increased morbidity due to delayed recovery and discharge. It also increases cost of because of delayed ambulation after discharge leading to delayed return to work. Treatment for postoperative pain after orthopedic surgical procedure based on conventional drugs (consisting of maximal dose of paracetamol, non-steroidal ant inflammatory drugs, and oral or intravenous opioid) with pain escape is very important. Nonetheless, this is associated with adverse effects, such as nausea, sedation, hypotension, reduced lung capacity and increased cardiac load. All these effects impede rehabilitation and early discharge [7].

Mean age of patients in Group D and Group C were 34.67±13.55 years and 38.93±12.54 years respectively. Mean (±SD) age of patients were almost identical in both groups (P>0.05). The Mean (±SD) age of the patients in our study was well in accordance with the study done by other workers. [8, 9]

It is evident that males are more prone to accidents in comparison to females in present study may be because of their nature of job. Since all the patients were taken for surgery only after the preanaesthetic assessment, the study was conducted only in routine hours.

Mean intra-operative pulse rate, systolic blood pressure, diastolic blood pressure, mean arterial pressure, SpO2 were found to be stable among the 3 groups and statistically insignificant (P> 0.05). Mean post-operative pulse rate, systolic blood pressure, diastolic blood pressure, mean arterial pressure among the 3 groups increased with increase in time due to bearing off of analgesic effect of drugs given intra-operatively but found to be statistically insignificant (P> 0.05).

In present study, VAS score was almost same in both the groups at 1,2,4,8,12,16,20 and 24 hours. The present study shows that dexamethasone group had higher VAS score (42.33±0.99) at 12 hours than control group (24.00±1.23), as control group received rescue analgesia at 8 hours. With respect to VAS at 20 and 24 hours no difference was found between the three groups. Fouad *et al* did a similar study who evaluated dexamethasone with bupivacaine hydrochloride 0.5% in TAP block and reported that VAS score was significantly lower upto 20 hours [9].

This was also confirmed by Gordon *et al*, that dexamethasone has potential as an additive to prolong the duration of analgesia [10].

Use of dexamethasone as an adjuvant for peripheral nerve blockade remains controversial. Some recent studies questions the benefit of perineural dexamethasone compared with intravenous route. Rahangdale R *et al* found that perineural dexamethasone (8 mg) did not improve quality of recovery. However, perineural dexamethasone prolonged analgesia and reduced pain on postoperative day one [11]. Whereas Dawson *et al* found that dexamethasone did not affect the rates of block success, postoperative pain scores, analgesic use, or nausea and vomiting. The route of dexamethasone administration did not alter its effects [12].

In another study De Oliveira *et al* gave 4 mg dexamethasone perineurally as adjuvant to brachial plexus block and concluded that there is no improvement in pain. This might be due to the dose taken in their study was less [13].

Time for the first rescue analgesia was 11.56±3.42hrs, and 6.92±1.24 hrs in dexamethasone and control group respectively which was found to be higher in dexamethasone group ($p<0.01$). Ammar *et al* found that time to first analgesia was significantly longer in the dexamethasone group (459.8 vs. 325.4 min, P=0.002), with lesser morphine requirements in the postoperative 48 h (4.9 vs. 21.2 mg, P=0.003) period [14].

In our study, we have found nausea and vomiting in both the groups. In both dexamethasone and control group 1 patient each had experienced nausea and vomiting which was quite comparable. All the patients were managed with Inj. Ondansentron 4 mg i.v. and 1 patient in control group had shivering postoperatively.

Conclusion

Dexamethasone is a good alternative as an adjuvant to Levobupivacaine hydrocholoride post operative pain relief in sciatic nerve block with minimal postoperative complication compared to Levobupivacaine hydrocholoride alone.

References

1. Sivrikaya GU. Multimodal Analgesia for Postoperative Pain Management. Sisli Etfal Training and Research Hospital, Department of 2nd Anaesthesiology and Reanimation, Istanbul, Turkey; 9: 177-211.
2. Bone ME, Dowson S, Smith G. A comparison of nalbuphine with fentanyl for postoperative pain relief following termination of pregnancy under dya care anaesthesia. Anaesthesia. 1988; 43:194-7.
3. Tourtier JP, Raynaud L, Murat I, Gall O. Audit of protocols for treatment of paediatric burns in emergency department in the lle de France. Burns. 2010; 36:1196-200.
4. Maharajan SK, Shreshtha BR, Tabedar S. Supraclavicular brachial plexus block with & without dexamethasone-A comparative study. Kathmandu university medical journal. 2003; 1(3):158-160.
5. Marks R, Barlow JW, Funder JW. Steroid induced vasoconstriction; glucocorticoid antagonist studies. J Clin EndoMeta, 1982; 54:1075-7.
6. Pick CG, Paul D, Pasternak GW. Nalbuphine, amixed kappa 1 and kappa 3 analgesic in mice. J Pharmocol Exp Ther. 1992; 262:1044-50.
7. Vallano A, Aguilera C, Arnau JM, Baños J-E, Laporte J-R. Postoperative Analgesia Study Group of the Spanish Society of Clinical Pharmacology Coordinating Centre and Data Analysis: Management of postoperative pain in abdominal surgery in Spain. A multicentre drug utilization study. British Journal of Clinical Pharmacology. 1999; 47(6):667-673.
8. Casati A, Santorsola R, Aldegheri G, Ravasi F, Fanelli G, Berti M, *et al*. Introperative epidural anesthesia and postoperative analgesia with levobupivacaine for major orthopaedic surgery: A double-blind, randomized comparison of racemic bupivacaine and ropivacine. J clin Anesth, 2003; 15(2):126-31.
9. Fouad HA, Ahmed AMS, Osman YMM, Abouelmagd GMT. Efficacy of preemptive dexamethasone added to bupivacaine in ultrasound guided transversus abdominus plain block for postoperative analgesia after inguinal herniorraphy. American Journal of Research Communication. 2016, 4(5):27-42.
10. Gordon KG, Choi S, Rodseth RN. The role of dexamethasone in peripheral and neuraxial nerve blocks for the management of acute pain, Southern African Journal of Anaesthesia and Analgesia. 2016; 22(6):163-9.
11. Rahangdale R, Kendall MC, McCarthy RJ, Tureanu L, Doty Jr R, Weingart A, *et al*. The Effects of Perineural Versus Intravenous Dexamethasone on Sciatic Nerve Blockade Outcomes: A Randomized, Double-Blind, Placebo-Controlled Study. Anesth Analg 2014; 118:1113-9.
12. Dawson RL, McLeod DH, Koerber JP, Plummer JL, Dracopoulos GC. A randomised controlled trial of perineural vs intravenous dexamethasone for foot surgery. Anaesthesia, 2016; 71:285-290.
13. De Oliveira Jr GS, Alves LJC, Nader A, Kendall MC, Rahangdale R, McCarthy RJ. Perineural Dexamethasone to Improve Postoperative Analgesia with Peripheral Nerve Blocks: A Meta-Analysis of Randomized Controlled Trials. Hindawi Publishing Corporation Pain Research and Treatment, 2014; 2014:1-9.
14. Ammar AS, Mahmoud KM. Effect of adding dexamethasone to bupivacaine on transversus abdominis plane block for abdominal hysterectomy: A prospective randomized controlled trial. Saudi J Anaesth. 2012; 6(3):229-33.