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TRAMADOL AS AN ADJUNCT TO BUPIVACAINE FOR BRACHIAL PLEXUS BLOCK.

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ABSTRACT… Objectives: To compare the efficacy of tramadol and 0.25% bupivacaine versus 0.25% bupivacaine alone for brachial plexus block. **Study Design:** Randomized controlled study. **Setting:** orthopedic department of Nishtar Medical University/Hospital Multan. **Period:** The study duration was Jan-2018 to Aug-2018. **Material and Methods:** 148 patients planned for with upper limb orthopedic procedures under BPB in the department of orthopedics department Nishtar Hospital Multan were included in this analysis. To Patients were randomly divided into two equal groups by lottery method. Group A patients were given solution with 38 ml 0.25% bupivacaine with 100 mg tramadol 2 ml and group B were given solution with 38 ml 0.25% bupivacaine and 2 ml 0.9 % normal saline. Time of onset of block and its duration and need for rescue analgesics were noted. **Results:** Time of onset of block was 14.56$\pm$1.01 minutes in group A versus 15.96$\pm$1.64 minutes in group B (p-value <0.001). Mean analgesia duration was 355.85$\pm$42.18 minutes in group A versus 310.47$\pm$38.79 minutes in group B (p-value <0.001). There were 51 (68.9%) patients in group A who required rescue analgesia and 68 (91.9%) patients in group B required rescue analgesia (p-value 0.004). **Conclusion:** We concluded that the addition of tramadol as adjunct to bupivacaine for BPB significantly shortens the duration of onset, prolongs the duration of analgesia and reduces the need for rescue analgesics.

Key words: Brachial Plexus Block, Bupivacaine, Tramadol, Opioids, Dexamethasone.

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INTRODUCTION

Post-operative pain is always very unpleasant to the patient and is always of major concern for anesthetist and surgeons. Therefore, optimum pain management is done relieve anxiety, and uneasiness of the patients.[1] Upper extremity surgery can be performed by employing various techniques like general anaesthesia, intra venous regional anaesthesia and local nerve blocks. Brachial plexus block (BPB) is now a widely used technique adopted by anesthesiologist for surgeries involving the upper limb and for acute pain management.[2] BPB is advantageous when compared with general anesthesia, because it provides better pain control, no side effects as with general anesthesia and llonger control of post-op pain.[3] However, the duration of block is only 8 hours to 14 hours even with the use of longer half-life local anesthetics.[4] Many adjuvants have been searched to extend the analgesic efficacy and to reduce adverse outcomes of local anesthesia such as perineural magnesium, dexmedetomidine, clonidine, dexamethasone and tramadol.[2,5-8]

Use of tramadol as oral or parenteral is now proven effective for post-op management of pain.[9] Tramadol minimizes pain using two different pathways; opioid like action mediated by action of μ receptors and 2nd one mediated by its α_2-adrenergic and serotoninergic activity.[10,11] Tramadol mainly inhibits descending pain pathways and hence prevents transmission of nociceptive signals to spinal cord.[12]

There is still an ongoing debate either the use of Tramadol as an adjunct to bupivacaine for BPB is beneficial or it do not have any protective effects.[13-15] So in present study we in present study we evaluated the efficacy of Tramadol as an adjunct to bupivacaine for BPB in patients undergoing upper extremity orthopedic

procedures.

METHODOLOGY

This randomized controlled trial was arranged in the orthopedic department of Nishtar Medical University/Hospital Multan. Permission of study was obtained from hospital IRB department. The study duration was Jan-2018 to Aug-2018.

Informed consent was taken from the attendants and patients, describing them objective and procedure of this study. They were briefed that there will be no harm to the patient and the confidentiality of your personal information will always be maintained.

Cases were selected from orthopedic department, Nishtar Hospital, Multan. Pre-operative visit was done a day before operation. Patients with upper limb surgeries meeting the inclusion criteria were included in the study. All patients were pre-medicated with half tablet lexilium 3 mg a night before operation.

Patients were randomly allocated into two equal clusters by lottery method. Patients were asked to pick A or B.

Group A were given solution with 38 ml 0.25% bupivacaine with 100 mg tramadol 2 ml.

Group B was given solution with 38 ml 0.25% bupivacaine and 2 ml 0.9 % normal saline.

Before starting the procedure, 18 G venous cannula was passed in the opposite hand of selected patients and routine monitors were attached like pulse oximeter, blood pressure cuff, ECG electrodes.

Supraclavicular BPB was performed in all patients in supine position with head bowed to opposite side. A 22 G (1.5 inch) needle was inserted just 2 cm above the midclavicular part and moved towards the subclavian artery until patients encountered paresthesia. 40 ml of local anaesthetic (Inj. bupivacaine 0.25%) with or without tramadol was injected in this area. Sensory block was tested by alcohol swabs.

Patients were given oxygen through mask and vitals monitoring (pulse, respiratory rate, blood pressure) and to monitor study outcomes for 30 minutes (at 5-minute interval) after that interval was increased to 10 minutes until the procedure ends. Time of onset of analgesia and time of injection of local anaesthetic was noted.

Throughout operation, patients were checked for any side effects and complications like respiratory distress, pneumothorax and seizures. All the observations were recorded and entered in the Proforma specifically designed for the study by the researcher. Time for requirement of first rescue analgesia was noted and entered in the Performa and thus duration of analgesia was measured. Bias, if any, was controlled by standardization of measurement technique.

For data analysis we used SPSS v23 software. For comparing the quantitative variables between the groups, we used independent sample t-test. While for comparing the qualitative data we used Chi-square test. P-value <0.05 was considered significant.

RESULTS

There were 148 patients in total. Mean age of the patients was 41.82 $\pm$ 13.67 years (41.51$\pm$13.50 years in group A versus 42.14$\pm$13.92 years in group B, p-value 0.78)). Males were 81/148 (54.7%) [39 (52.7% in group A & 42 (56.8%) in group B], while females were 67/128 (45.3%) [35 (47.3%) in group A & 32 (43.2%) in group B, p-value 0.62]. Mean weight of the patients was 57.50$\pm$11.50 Kg (56.45$\pm$10.52 Kg in group A versus 58.55$\pm$12.13 Kg in group B, p-value 0.26) Table-I.

Time of onset of block was 14.56$\pm$1.01 minutes in group A versus 15.96$\pm$1.64 minutes in group B (p-value <0.001). Mean analgesia duration was 355.85 $\pm$ 42.18 minutes in group A versus 310.47 $\pm$ 38.79 minutes in group B (p-value <0.001). There were 51 (68.9%) patients in group A who required rescue analgesia and 68 (91.9%) patients in group B required rescue analgesia (p-value 0.004) Table-II.

	Tramadol group (A) (n=74)	Control group (B) (n=74)	P-value
Mean age (years)	41.51 ± 13.50	42.14 ± 13.92	0.78
Male gender	39 (52.7%)	42 (56.8%)	0.62
Female gender	35 (47.3%)	32 (43.2%)	
Mean weight (kg)	56.45 ± 10.52	58.55 ± 12.13	0.26

Table-I. General characteristics of the patients.

	Tramadol group (A) (n=74)	Control group (B) (n=74)	P-value
Onset of block (min)	14.56±1.01	15.96±1.63	<0.001
Mean duration of analgesia	355.85 ± 42.18	310.47 ± 38.79	<0.001
Need for Analgesia	51 (68.9%)	68 (91.9%)	0.004

Table-II. Comparison of study outcomes.

DISCUSSION

The use of BPB has become a routine practice in orthopedic procedures because it provides excellent surgical environment with very little discomfort and complications for surgeries involving the arm and forearm.[16] Bupivacaine is a commonest drug for induction of BPB, and can alone provide analgesia for a reasonable time margin.[17] Additives are added to bupivacaine to increase the duration of block induced by bupivacaine. In present study we added tramadol along with bupivacaine for BPB and evaluated its effects on time of block onset, duration of analgesia and need for rescue analgesics. We found a significant positive effects of tramadol addition, as it enhances the early onset of block, provides longer duration of analgesia and reduces the rescue analgesics requirements.

Common adverse effects of tramadol administration are sedation, dizziness, nausea, vomiting and headache. These adverse effects are lower when tramadol is given for BPB as compared to its intra-venous regimens.[18]

A study conducted by Khosa et al. reported similar results. They found shorter time of block onset, 16.20±.96 minutes in tramadol versus 17.3±1.49 minutes in control group. they also reported longer duration of block 6.9±0.76 hours in tramadol versus 4.7±1.07 hours in control group.[19]

Kesimci et al. conducted a similar study by using ropivacaine for BPB using tramadol as adjuvant. The authors reported no benefit of addition of tramadol. They found mean bock time 631 ± 33 min in tramadol versus 633 ± 37 min in control group.[15]

Kaabchi et al. reported late onset of block using tramadol for BPB. They concluded that the longer duration is countered by slow onset so there is no benefit of adding tramadol for BP.[20] However these authors used lidocaine as a primary drug for induction of BPB and we used bupivacaine as a primary drug.

Another study by Sarcu et al. failed to found any significant beneficial effects of addition of tramadol and axillary plexus block in-terms of need for rescue analgesics, satisfaction score and VAS score during the procedure.[21]

A recent meta-analysis by Shin et al. on effectiveness of tramadol (100 mg) as adjunct to local anesthetic drugs concluded that the addition of tramadol is associated with early onset of sensory and motor block, it prolongs the duration of analgesia and reduces the requirement of rescue analgesics. But it did not reduce the adverse effects associated with BPB in these patients.[2]

CONCLUSION

In present study, we concluded that the addition of tramadol as adjunct to bupivacaine for BPB significantly shortens the duration of onset,

prolongs the duration of analgesia and reduces the need for rescue analgesics.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Afifa Zahoor	Conceived, designed, data analysis and editing of manuscript.	
2	Ranna Mussrat	Did data collection and manuscript writing.	
3	M. Ahmad Khan	Helped in writing the manuscript and did review and approved the final version for publication.	
4	Shakeel Ahmad	Co-Author