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# A Small Dose Clonidine Prolongs Post-Operative Analgesia after Sciatic – Femoral Nerve Block with 0.75% Ropivacaine for Foot Surgery: A Hospital Based Study

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## Abstract

**Background:** To understand the effect of small dose clonidine with 0.75% ropivacaine for foot surgery, Hallux valgus repair is a minor surgical procedure, which leads to severe pain post surgicaly. For this reason, regional anaesthesia along with long-acting local anaesthetics has been advised. **Subjects and Methods:** All patients were screened for any other systemic disorder. Any patients with diabetes, hypertension or thyroid issues were also not included in the study. Patients of age group 18-75 were included in the surgery. The patients were divided randomly into two groups. Group A patients (16 patients) were injected with 1 µg/kg clonidine to 0.75% ropivacaine during combined sciatic-femoral nerve block for the repair of hallux valgus, whereas group B patients (16 patients) were injected with only 0.75% ropivacaine during the repair procedure. **Results:** It was observed that, not much difference was seen in the time required to achieve surgical anaesthesia between the patients receiving only 0.75% ropivacaine which was 10 minutes approx. **Conclusion:** As a result of this prospective, randomized, double-blinded study demonstrate that adding 1 µg/kg clonidine to 0.75% ropivacaine has no major effect on onset time and quality of combined sciatic-femoral nerve block.

**Keywords:** Anaesthesia, Clonidine, Ropivacaine.

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## Introduction

To understand the effect of small dose clonidine with 0.75% ropivacaine for foot surgery, Hallux valgus repair is a minor surgical procedure, which leads to severe pain post surgically.[1] For this reason, regional anaesthesia along with long-acting local anaesthetics has been advised.[2,3] The injection of an α agonist along axons has been advised to enhance the nerve block characteristics of local anaesthetic solutions through either a local vasoconstriction.[4] a facilitation of C fibre blockade from the local anaesthetic solution,[5] or a spinal action caused by slow retrograde axonal transport or single diffusion along the nerve.[6] Also, α2 receptors have been directly isolated on peripheral nerves of the rat,[7] whereas in clinical studies, by simply addition of clonidine to local anaesthetic solutions increased efficacy of peripheral nerve blocks by reducing the onset time, extending postoperative analgesia.[8-10] Ropivacaine has evolved into a new long-acting local anaesthetic solution with a desirable profile for peripheral nerve blocks when used at 0.75% or 1% concentrations.[11] However, less is known about the interaction between small-dose clonidine and ropivacaine when used as a peripheral nerve block. The aim of this study, randomized, double-blinded study was to evaluate the effects of adding 1 µg/kg clonidine to 0.75% ropivacaine during combined sciatic-femoral nerve block for the repair of hallux valgus. The present study was conducted with the aim to analyse whether a Small Dose Clonidine Prolongs Post-Operative Analgesia after Sciatic –Femoral Nerve Block With 0.75% Ropivacaine for Foot Surgery.

## Subjects and Methods

The study was conducted upon a total of 32 patients over a period of 14 months, in Department of General Surgery and Department of Anaesthesia, RVRS Medical College & Associated Group of Hospitals, Bhilwara, Rajasthan, India. All patients were screened for any other systemic disorder. Any patients with diabetes, hypertension or thyroid issues were also not included in the study. Patients of age group 18-75 were included in the surgery. [Figure 1]. The patients were divided randomly into two groups. Group A patients (16 patients) were injected with 1 µg/kg clonidine to 0.75% ropivacaine during combined sciatic-femoral nerve block for the repair of hallux valgus, whereas group B patients (16 patients) were injected with only 0.75% ropivacaine during the repair procedure. For every patient time of injecting the

anaesthetic solution, time of onset of anaesthetic solution and duration of anaesthetic action was recorded. [Table 1] Before starting the surgery, an 18-gauge IV cannula had been inserted in the forearm, midazolam 0.05 mg/kg IV was given as premedication 10 min prior block placement. Standard monitoring procedure was used throughout the study, including non-invasive arterial blood pressure (B 606; Lohmeier, Munich, Germany), heart rate, and pulse oximetry. All the data thus obtained was arranged in a tabulated form and analysed using SPSS software.

## Results

It was observed that, not much difference was seen in the time required to achieve surgical anaesthesia between the patients receiving only 0.75% ropivacaine which was 10 minutes approx. and also those receiving the ropivacaine-clonidine mixture i.e. 10 minutes approximately. The level of sedation caused was measured according to the Observer's Assessment of Alertness/Sedation scale during the first 30 min after injecting the anaesthesia. Ten minutes after block placement, it was observed that patients in Ropivacaine-Clonidine group were slightly more sedated than those patients receiving only 0.75% ropivacaine. [Table 1] However, no other differences were observed at further assessments, and no clinically relevant decrease in oxygen saturation was seen in either group.

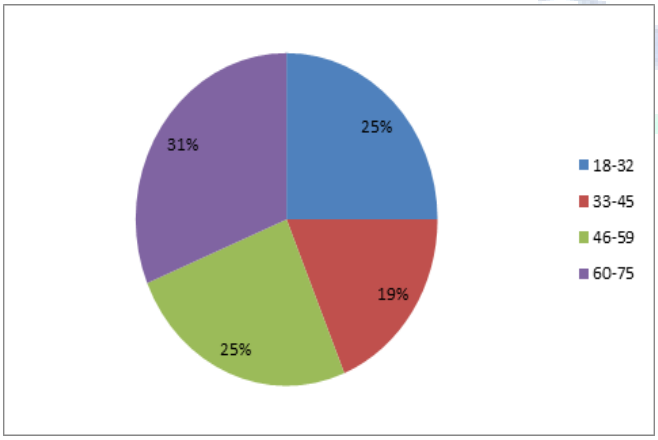


**Figure 1: Age variation amongst the subjects**

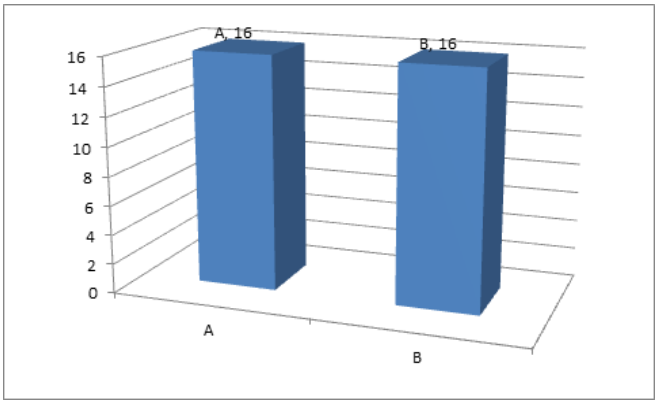


**Figure 2: Number of subjects in each group**

**Table 1: Responsiveness of the subjects**

| Responsiveness | Score | Group A (n) | Group B (n) |
|---|---|---|---|
| responds readily to name spoken in normal tone | 5 | 6 | 8 |
| lethargic response to name spoken in normal tone | 4 | 2 | 2 |
| responds to name shouted loudly / repeatedly | 3 | 2 | 3 |
| responds only after mild prodding or shaking | 2 | 3 | 1 |
| does not responds to mild prodding or shaking | 1 | 1 | 2 |
| does not responds to noxious stimuli | 0 | 2 | 0 |

## Discussion

According to Bernard and Macarie the effects of adding 30 to 300 µg clonidine to lidocaine for axillary brachial plexus anesthesia, suggested that adding clonidine reduced the onset and improved the efficacy of surgical anaesthesia. However, it was observed in our findings, that neither the onset nor the efficacy of nerve blockade was affected by adding clonidine.[12] Such variations were observed with the effects of small-dose clonidine on onset time and efficacy of nerve block which can be explained by differences in the type of nerve block, mixture injected, and also on the technique used to perform the block (single injection versus multiple injections). A multiple-injection technique was used, which is known to improve both onset time and quality of nerve block, and this could have definitely reduced the differences in onset time between the two groups.[13-15] Also, the duration of postoperative pain relief after sciatic-femoral nerve block performed with 0.75% ropivacaine alone was similar to the findings reported in previous investigations. The small doses clonidine provided a nearly 20% prolongation of postoperative analgesia. The surgical procedures were performed by simply using a standard thigh tourniquet inflated 100 mm Hg higher than systolic arterial blood pressure. Hemodynamic variables were measured before block placement (referred as baseline) and every 5 min until the end of surgery. In the presents study, the level of sedation caused was measured according to the Observer's Assessment of Alertness/Sedation scale during the first 30 min after injecting the anaesthesia. Ten minutes after block placement, it was observed that patients in Ropivacaine-Clonidine group were slightly more sedated than those patients receiving only 0.75% ropivacaine. Sensory and motor blocks on the operated limb were evaluated at every 2, 5, 10, 20, and 30 min after the completion of the anaesthetic injection by an independent, blinded observer. Further measurements were performed as per protocol until surgical anaesthesia was achieved. Sensory block was evaluated by simply using a pinprick test (22-gauge hypodermic needle), and motor block was evaluated by asking the patient to move the ankle against resistance and to elevate the leg with the hip passively flexed, which again is a standard protocol for the anaesthetic surgery. At the same time, arterial blood pressure, heart rate, haemoglobin

oxygen saturation, and degree of sedation were equally evaluated.

## Conclusion

As a result of this prospective, randomized, double-blinded study demonstrate that adding 1 μg/kg clonidine to 0.75% ropivacaine has no major effect on onset time and quality of combined sciatic-femoral nerve block, but does prolongs nerve block duration, providing a three-hour prolongation in the postoperative pain relief, with only a mild, short-lived increase in the degree of sedation and no hemodynamic side effects.

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