



## EFFICACY OF AXILLARY PLEXUS BLOCKS IN PROVIDING INTRAOPERATIVE ANALGESIA FOR ORTHOPAEDIC FIXATION PROCEDURES OF FOREARM FRACTURES IN PEDIATRIC AGE GROUP.

**Dr. Vishaka. H**

Junior Resident Year Department Of Anaesthesia MGM Medical College And Hospital Kamothe, Navi Mumbai, Maharashtra, India.

**Dr. Shweta Naik\***

Senior Resident Year Department Of Anaesthesia MGM Medical College And Hospital Kamothe, Navi Mumbai, Maharashtra, India. \* Corresponding Author

**Dr. Olyvna D'souza**

Professor Department Of Anaesthesia MGM Medical College And Hospital Kamothe, Navi Mumbai, Maharashtra, India.

**ABSTRACT**

Axillary block is considered as one of the most effective anaesthetic methods for for upper limb surgeries with drawbacks of pneumothorax, vessel puncture and failure of block due to inaccurate needle placement. Ultrasound guided may decrease these complications and increase the accuracy of the block, particularly in paediatric age group. This is a study we conducted to know the efficacy of axillary plexus block in providing intraoperative analgesia for orthopaedic fixation procedures of forearm fractures in paediatric age group.

**KEYWORDS :****INTRODUCTION -**

Brachial plexus blockade is an excellent anaesthetic option for upper limb surgery with long lasting pain relief, a low incidence of nausea and vomiting. However, inconsistent block success remains one of the major limitations of brachial plexus blockade and can lead to an unplanned general anaesthetic, increase material costs, and prolong operating room time<sup>1,2</sup>. These complications have now been reduced and success in performing the nerve block has been increased by the aid of nerve stimulator, ultrasound, fluoroscopic roentgenogram or computerized tomography<sup>3-6</sup>. Axillary brachial plexus block is one of the most popular and widely used techniques for brachial plexus blocks<sup>7</sup>.

Numerous upper limb procedures, in particular orthopaedic ones, could be carried out under axillary block. Various methods such as transarterial, single or multiple parasthesia, or catheterization into the plexus sheath have been used to improve the success rates of this block<sup>9-11</sup>. As vessels and nerves in the brachial plexus region are enclosed within the axillary sheath,<sup>7,12</sup> the application of ultrasound with high-resolution imaging permits accurate real-time targeting of the plexus sheath and allowing the injection and spread of the local anaesthetic.

**AIMS AND OBJECTIVES**

- To evaluate the accuracy of using guided method of axillary brachial plexus block.
- To evaluate the efficacy of axillary plexus blocks in providing intraoperative analgesia for orthopaedic fixation procedures of forearm fractures in paediatric age group.

**MATERIALS AND METHODS**

- This study will be conducted on paediatric patients operated with closed/open reduction and internal/external fixation of forearm fractures.
- Study duration :** 15 months ( May 2016 to Aug 2017 )
- Study site :** Department of anaesthesiology.
- Sample size :** Records of all patients operated between the period of May 2016 to Aug 2017
- Study Procedure :** Patients received an axillary block under ultrasound guidance using a SonoSite linear 6 - 13MHz HFL38 transducer probe. The probe surface was covered by a sterile transparent dressing and sterile gel was applied prior to scanning. Individual nerves, axillary vessels, and adjacent muscles (biceps, coraco-brachialis and triceps muscles) were identified in a transverse view. The ultrasound probe was orientated consistently to display the biceps muscle on the left side of the sonogram screen (above the artery) and the triceps muscle on the right side (below the artery). Location of individual nerves was recorded according to a schematic drawing of eight pie-chart sectors<sup>14</sup>. The needle was advanced 'in plane' with the ultrasound beam until the needle tip was placed adjacent to each target nerve before local anaesthetic was injected to produce a circumferential spread around each target nerve.

**MATERIALS AND METHODS****INCLUSION CRITERIA**

- Age from 5 years to 15 years.
- Both males and females.
- Radius, ulna or both bone fractures.
- Unilateral forearm fractures.

**EXCLUSION CRITERIA**

- age less than 5 years and more than 15 years.
- patients treated with closed reduction and casting.
- Non co operative patients.
- All observations were recorded according to VAS scale at an interval of every 15
- minutes starting from time of incision till the completion of surgery.

**RESULTS**

- 21 patients gave satisfactory results with complete motor and sensory block and no intra operative complications.
- 8 patients in the group were determined to have incomplete blocks (6 had residual motor function and 2 had residual motor function with pain sensation); 2 had failed blocks which required supplemental analgesia.

Time (minutes)	VAS score (cm)	Standard Deviation
0	0.7	0.35
15	0.2	0.26
30	0.2	0.33
45	0.3	0.12
60	0.4	0.24
75	0.6	0.33
90	0.6	0.26

**DISCUSSION**

Nerve blocks are a relatively safe method of inducing analgesia. Although, nerves are frequently punctured and infiltrated with local anaesthetic during the procedure, reports suggest that nerve puncture or intraneural injection does not inevitably lead to neurologic injury. In the above study, in ultrasonography, the median nerve was most commonly found in sectors 7 and 8 (50%), the ulnar nerve in sectors 1-3 (90%) and the radial nerve in sectors 2 and 3 (60%). These observations were similar to those made by Retzl G et al in 2001.<sup>14</sup> VAS scoring system is an accurate tool for measurement of pain and a VAS measurement should be considered as accurate as  $\pm 12$  mm for children of 8-17 years of age suffering from acute pain. Thus, a change of more than 12 mm on the VAS is required to conclude that a true change in pain intensity has indeed occurred in a child.<sup>16</sup> In the above study, all the procedures were completed within 90 minutes of incision, Supplementary analgesia (sedation) was given in 8 out of 31 patients. In the study, failed block was seen in 2 cases out of 31, which required general anaesthesia.

**CONCLUSION**

Ultrasound-guided method is a fairly acceptable method of giving axillary brachial plexus block. Axillary plexus blocks provide excellent sensory and motor blockades with a low incidence of requirement of supplementary analgesia and fewer adverse events.

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