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THE USEFULNESS OF FENTANYL AS AN ADJUVANT IN BRACHIAL PLEXUS BLOCK FOR POSTOPERATIVE ANALGESIA

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Abstract

Objectives: This study aimed to determine use of fentanyl as a safe adjunct with local anaesthetic agents prolongs the duration and efficacy of analgesia during the post-operative period after supraclavicular brachial plexus block.

Design: The study was conducted on ASA I-II patients scheduled to have brachial plexus block. They were randomly divided into control and study groups. Patients in the control group received 20 mL 0.5% bupivacaine, 10 mL 2% lidocaine and 2 mL normal saline. The study group received 20 mL 0.5% bupivacaine, 10 mL 2% lidocaine and 2 mL fentanyl (100 µg). Onset times for sensory and motor block were recorded. Post-operative pain intensity was determined using Numerical Rating Score (NRS) system for 24-hour period and any breakthrough pain was noted.

Results: 50 patients were studied with 25 in each group. The overall mean NRS for immediate postoperative pain in the fentanyl group was 2.6 compared to that of the control group which was 3.8 ($p < 0.001$). 24 h post-operatively, the NRS ranged between 1 and 8; the mean NRS in control group was 5.7 while it was 3.8 in the study group ($p < 0.001$). There was also a significant reduction in the incidence of breakthrough pain in the fentanyl group ($p < 0.0001$).

Conclusions: The study found that the addition of 100 µg fentanyl in supraclavicular brachial plexus block prolongs the duration of analgesia without any side effects. Fentanyl can be used as a safe adjuvant for supraclavicular brachial plexus blocks to improve the quality of analgesia..

Introduction

The objective of achieving analgesia with use of opioids analgesics without its desirable side effects (respiratory depression, nausea and vomiting and cardiovascular instability) for the treatment of severe pain is difficult when administered systemically.

Supraclavicular brachial plexus block provides anaesthesia and analgesia of the upper limb surgery in the most consistent and efficient manner. The agonist effect of fentanyl on opioid receptors has been shown to be of benefit in central neuraxial blocks by increasing the duration of pain relief, therefore the need to extend the analgesia during postoperative period using various adjuncts requires attention.

Although it is unclear if the effects of adding opioids result either from a truly peripheral or from a central site of action, this study aimed to determine if there is an effect on the quality of analgesia by adding fentanyl to local anaesthetics in brachial plexus blocks.

Methods

This prospective, randomized, double-blind study was approved by the University Ethics Committee and the Institutional Review Board of South West Regional Health Authority (SWRHA). All participants fulfilling inclusion criteria were explained and written informed consent was obtained for the procedure. Patients were randomly divided into two groups and received the following medications: Group I (Control): bupivacaine 0.5% 20 mL + lidocaine 2% 10 mL + Normal Saline 2 mL

Group II (Study): bupivacaine 0.5% 20 mL + lidocaine 2% 10 mL + fentanyl 2 mL (100µg).

Results

Variable	Control group Mean (SD)	Study group Mean (SD)	P value* *
Age (yr)	38.9 (14.8)	50.2 (16.3)	0.015
Onset time – sensory block (min)	21 (6.8)	20.5 (8.4)	0.470
Onset time - motor block (min)	26.4 (8.1)	25.8 (10.7)	0.470
Surgical duration (min)	96 (33.3)	86.4 (27.4)	0.445
VRS* postop (hr)	3.8 (1.2)	2.6 (0.8)	0.001
VRS* 24 hours	5.7 (1.4)	3.8 (1.1)	<0.001

Table1: Comparison of groups

*VRS: Verbal Rating Scale

**P-value obtained by Mann-Whitney U test

Results

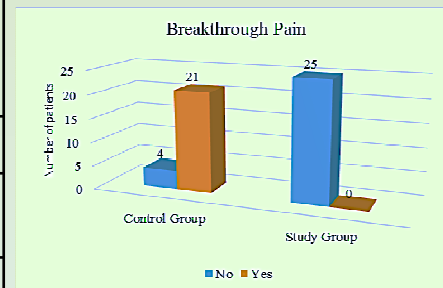


Figure 1: Breakthrough pain
 Chi-square value 36.2; df: 1; $p < 0.0001$

Conclusions

Addition of fentanyl to local anaesthetic solution did prolong the sensory block thereby extending the duration of analgesia. Also, the incidence of breakthrough pain was significantly lower in the postoperative period.

There was no effect on the motor block and there was no significant side effects of fentanyl. Fentanyl is beneficial adjuvant to local anaesthetics for supraclavicular brachial plexus blocks.

