

SUPPLEMENTAL PETHIDINE AND FENTANYL TO LOCAL ANESTHETICS IN SUPRACLAVICULAR BLOCK

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Abstract- It has been suggested since long that peripheral nerves possess opioid receptors and this has tempted clinicians in adding narcotics to local anesthetics to prolong the analgesic effects of these solutions. In this regard, we studied 45 patients undergoing surgical procedures on upper extremities. The patients scheduled for surgery were divided in to three groups, each comprising of 15 patients and all the patients underwent supraclavicular block. In group A, we used 5 mg/kg of 1.5 percent lidocaine, in group B the same dose of lidocaine along with 1 mcg/kg of fentanyl solution was used. Lidocaine in the above dosage and pethidine 1 mg/kg were injected to the patients in group C to facilitate supraclavicular block. The average length of analgesia was 180 minutes in group A, 300 minutes in group B and 406 minutes in group C. In conclusion: Adding pethidine or fentanyl to local anesthetics can increase the analgesia period 2-3 times. Although pethidine implies longer effect than fentanyl, but this difference is not significant ($P > 0.05$).

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Key Words : Local anesthetics, supraclavicular block, pethidine, fentanyl

INTRODUCTION

Since long the science of analgesia has tried to alleviate or decrease pain in all patients. In order to accomplish this goal, different methods have been forwarded such as peripheral and plexus nerve blocks. Attempts to relieve pain especially in postoperative periods has augmented the widespread use of these methods. It is desired to make the nerve blocks subtle and more complete along with a prolonged analgesic effect. To achieve such goals, the effects of narcotics added to local anesthetics has been studied many times with contradictory results (1-4). Some of the opinion that the addition of narcotic to local anesthetics prolong their analgesic effects (3) while others state different views (11). Because in addition to the opioid properties, some local anesthetic effects have also been attributed to pethidine (5), in a randomized and double blind clinical trial study, we evaluated whether the addition of pethidine or fentanyl to a local anesthetic would produce a more prolonged analgesia. This study was performed on orthopaedic patients of Imam Khomeini Hospital of Tehran in 1999.

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MATERIALS AND METHODS

In a randomized, double blind clinical trial, 45 orthopaedic patients (15-75 years of age) who were admitted to Imam Khomeini Hospital of Tehran, in 1999, with a physical status I and II according to ASA classification were evaluated. Patients were randomly allocated to three groups : A, B, C and each group comprised of 15 individuals (Fig. 1). Patients who had a history of drug addiction, systemic disease and infection at the site of injection were excluded from the study. Surgical procedures were conducted on upper extremities in all patients and analgesia was carried out by supraclavicular block utilizing paresthesia technique without administering any analgesic or sedative drug to the subjects as premedication. The drug used for the block was supplied by a concerned person and injected by the researcher physician totally blinded to the medication being used. Before attempting the block, the technique, its advantages and probable complications were explained to the patient and after obtaining an informed consent, the block was initiated and performed. After injection of the drug and having being assured of complete analgesia surgical procedure was started and the patients were listed in one of the groups mentioned above by the individual supplying the medication and only the group type of the patient was acknowledged to the researcher

physician. In group A, patients received 5 mg/kg of 1.5 percent lidocaine. In group B the same dose of lidocaine + 1 mcg/kg of fentanyl was utilized and in group C the same dose of lidocaine+1 mg/kg of pethidine were used as anesthetic agents. All the patients were followed and assessed by the researcher after operation and questions pertaining to pain at the site of surgery were enquired. The patients had been told to report the onset of pain to the nurse incharge after leaving the operating room. This study was conducted with a power =80% in 45 patients divided into three different groups. Comparison between groups were made with ANOVA following Tukey -B test. A $P<0.05$ was considered to be statistically significant.

RESULTS

A total of 45 patients in three separated groups, were studied. Of them 33 (73.3%) were male and 12 (26.7%) were female (Fig.1). Table 1 shows other personal findings in these three groups. The mean \pm standard deviation (SD) time of analgesia in group A was 180 ± 46.3 minutes (range, 120-280 min). In group B this period was 300 ± 116.9 minutes (range, 140-510 min),and in group C was 406 ± 289.4 minutes (range, 130-1120 min) (Fig.3). Duration of sensory block and motor block in each group are stated in table 2.

Table 1. Personal characteristic of patients in three groups

	Group A	Group B	Group C
Age (mean \pm SD)	35 \pm 6.2	37 \pm 7.1	41 \pm 8.4
Male	12 (80%)	11 (73.3%)	10 (66.6%)
Female	3 (20%)	4 (26.7%)	5 (33.3%)
Weight (mean \pm SD)	58 \pm 14	40 \pm 10	59 \pm 12

Table 2. Comparison of findings in three groups

Duration	Group A	Group B	Group C	F
Analgesia (\pm SD)	181 \pm 46.3	300 \pm 116.9	4.6 \pm 289.4	F< 0.005
Sensory block (\pm SD)	205 \pm 48	319 \pm 86	431 \pm 87	F< 0.005
Motor block (\pm SD)	175 \pm 70	278 \pm 75	383 \pm 99	F< 0.005

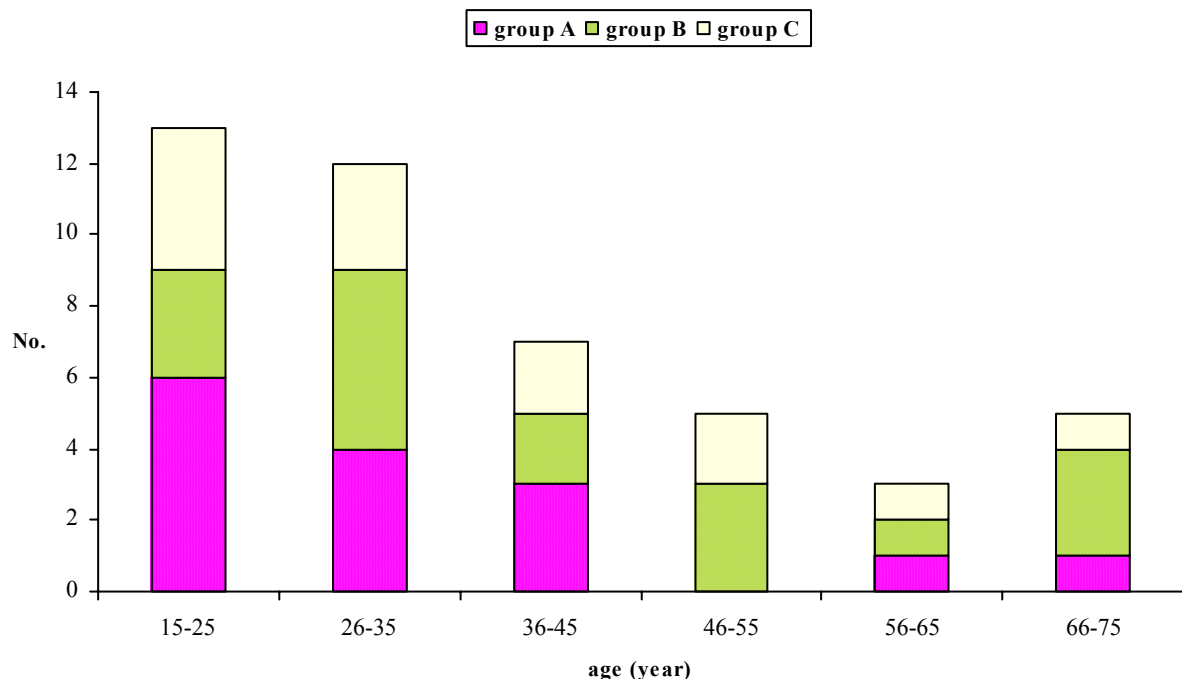


Fig. 1. Distribution of patients by age in each group

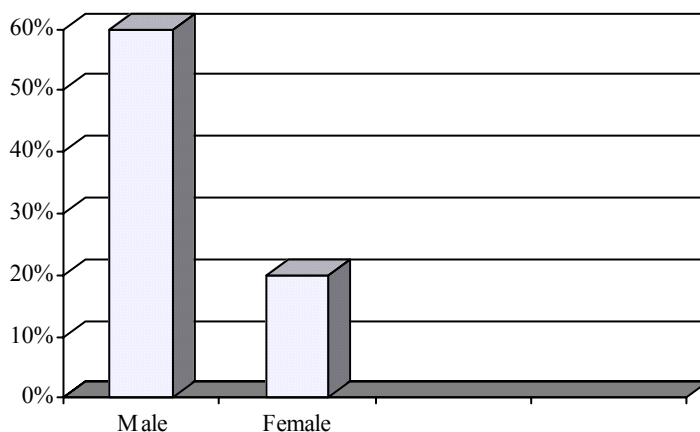


Fig. 2. The sex distribution of patients

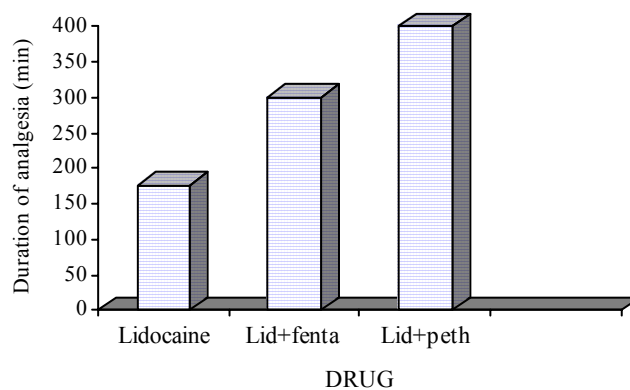


Fig. 3. Duration of analgesia

DISCUSSION

It is clear that analgesia time in group C is longer than the two other groups and it can be concluded that addition of narcotics to local anesthetics prolong the analgesic effects of these drugs. To date results of studies evaluating the efficacy of opioids and local anesthetic combinations in the brachial plexus are inconclusive. Results of some studies show that adding narcotics to local anesthetics is very effective in prolonging the analgesic effect of the latter solutions while others express ineffectiveness of such combination of drugs. In one study it has been shown that addition of sufentanil 0.2 mcg/kg, bupernorphin (3 mcg/kg) and morphine (75 mcg kg) to bupivacaine+ lidocaine solution resulted in 24, 20 and 21 hours of analgesia (6). Bouaziz *et al*, demonstrated that the addition of sufentanil in a dose-dependent manner to 1.5% mepivacaine in the axillary plexus does not improve onset or duration of block (7). Nishikawa *et al.* showed that fentanyl improves analgesic effect of 1.5% lidocaine but prolongs the onset of blockade (8).

In another study, Fanelli demonstrated that fentanyl does not improve the characteristic of axillary plexus block performed with mepivacaine (9). In current investigation, we selected pethidine and fentanyl, because they are easily available besides the fact that pethidine also possesses local anesthetic properties. According to our results : 1- Adding pethidine or fentanyl to local anesthetic solutions could increase the analgesia period 2-3 times compared to utilization of local anesthetics alone thus proving its efficacy in postoperative management. 2- Pethidine implies longer effect than fentanyl; but this difference is not significant ($P>0.05$) from statistical point of view which could be due to dispersion of the findings. Considering the shorter duration of analgesia in group C (130-1120 min) it can be deduced that a wide range exists between two ends of this spectrum compared to the mean figure (406 min) and this attributes to a p-value being greater than 0.05. Therefore it can be postulated that although pethidine produces longer analgesia time compared to fentanyl, but from statistical point of view, this difference is not

meaningful. We believe that perhaps a huge sample size could make these differences much meaningful.

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