



COMPARATIVE EVALUATION OF ANALGESIA OF NEBULISED FENTANYL (4 MCG/KG) WITH INTRAVENOUS FENTANYL (1MCG/KG) FOR POST OPERATIVE PAIN RELIEF IN ABDOMINAL SURGERIES

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration among all authors. Author VKD designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Authors VM, DK, AJB and RMM and managed the analyses of the study. Authors AH, DKM and MA managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

In the present study patients belonging to a specific group had received nebulised fentanyl (4 mcg/kg) and IV saline whereas participants belonging to other group had received intravenous fentanyl (1 mcg/kg) and nebulized saline and postoperative analgesic efficacy was assessed using visual analog scale (VAS) score. The mean baseline heart rate of both the group and group was 91 ± 7.76 and 94 ± 5.48 respectively. The change observed in heart rate in both group over the period of time was almost same and the difference observed was statistically non-significant. Systolic and diastolic blood pressure differences were statistically significant in both groups however the difference noted was not clinically significant.

Keywords: Analgesia; nebulised fentanyl; intravenous fentanyl; abdominal surgery; analgesia.

1. INTRODUCTION

The main essence of anesthesia is adequate pain relief with rapid and a complete recovery with minimal side effects. The International

Association for Study of Pain (IASP) has characterized it as an undesirable tangible and enthusiastic experience related with genuine or potential tissue harm or portrayed regarding such damage [1].

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Pain is a multidimensional phenomenon that can be characterized by position of pain, severity, temporal dimensions, consistency, effect and meaning. Since each individual perceives pain differently and by natural is complex, health care providers are unable to predetermine the amount of pain a patient might have after surgery [2]. The idea of having a surgery can naturally cause anxiety and fear that can lead to increased levels of pain post-operatively [3].

Abdominal surgeries are routinely performed surgeries. These surgeries are commonly done under subarachnoid block. As the effect of anesthesia wears off patient starts complaining of pain. More than 80% of patients undertaking careful activities feel intense postoperative agony and almost 75 percent of patients with postoperative torment record gentle, extreme or genuine seriousness [4,5].

Inadequately managed pain adversely impacts the quality of life, function and physical rehabilitation, the risk of post-operative complications, and the risk of chronic post-operative pain [6]. Pain and its management are vital elements in surgical guidelines and providing postoperative analgesia is an important responsibility of an anesthesiologist. Opiate analgesia may assist the anesthesiologist in this task while providing relief for the patient [7,8]. Fentanyl may be chosen over other analgesics because of its rapid onset of action and short half-life, which allow for reevaluation, excellent safety profile, and minimal effect on hemodynamics [7,9].

2. AIM AND OBJECTIVES

Aim: To compare postoperative analgesic efficacy of nebulised fentanyl with that of intravenous fentanyl in dose of 4 mcg/kg and 1 mcg/kg respectively in abdominal surgeries by using VAS score.

Objectives: To analyze postoperative pain relieving viability of nebulised fentanyl with that of intravenous fentanyl.

3. REVIEW OF LITERATURE

Abdominal surgery is the most general operating technique, with a wide variety of emergency and elective surgical procedures [10]. In fact, digestive system complications are one of the causes for surgeons to enter the abdominal cavity. It applies to any elective major operation requiring, and only, the opening of the abdomen with anaesthesia.

Saranya et al. [11] compared the analgesic efficacy of nebulised fentanyl with IV fentanyl for postoperative

pain relief in lower abdominal surgery in a sample size of 100 patients in a prospective, randomized clinical investigation. There were two study groups: I.V fentanyl group, Group C (control) and Nebulized fentanyl, Group N (study group). The enrolled patients underwent 60-90 minutes of surgery under spinal anaesthesia with 12.5 mg bupivacaine. Once the patients complained of pain post-operatively which was assessed by Verbal Numerical Rating Scale (VNRS), they were given the study drug according to their groups, as 4 ml of 2 mcg/kg intravenous fentanyl in control group (Group C) and 5 ml of 4 mcg/kg nebulized fentanyl in study group (Group N), respectively. The data obtained was statistically analyzed by using chi-square test and students unpaired t-test. The values are found to be significant statistically at $p < 0.05$ level. Saranya et al. concluded that nebulized fentanyl at 4 mcg/kg produces effective postoperative analgesia with longer duration of action and with minimal adverse effects.

4. MATERIALS AND METHODS

The present study was undertaken at a tertiary care centre (Krishna Institute of Medical Sciences, Karad) after due approval of the Institutional Ethical Committee. Both male and female postoperative patients from August 2015 to July 2017, were included in this clinical study. Detail procedure was explained to the patients and informed written consent of the patients was taken.

Patients with complains of postoperative pain with VAS Score > 4 . Patients who were available for assessment up to 2 hours post operatively. Patients in age group between 18 to 45 years. Patients willing to participate in study. Patients belonging to physical status ASA I and ASA II. All the patients in the study underwent a detailed pre anaesthesia check-up the day before the surgery. Detailed history was taken and all patients underwent general and systemic examination. All the relevant investigations were done including complete blood count, urine examination, Liver function tests, renal function tests and serum electrolytes. All the patients were educated about VAS scale.

5. OBSERVATION AND RESULTS

The age groups were comparable in both groups. Majority of the patients in the present study were in the age group of 31-40 years. [Table 1]

The age groups were comparable in both groups. Majority of the participants undergoing abdominal surgeries were female in both the group. [Table 2]

Table 1. Age distribution [17]

Age groups (years)	Group C [IV fentanyl (1mcg/kg)]		Group S [nebulised fentanyl (4mcg/kg)]	
	Number	Percentage	Number	Percentage
18-30	13	43.3	11	36.6
31-40	14	46.6	16	53.3
41-45	03	10	03	10
Total	30	100	30	100

Table 2. Sex distribution [17]

Sex	Group C		Group S	
	Number	Percentage	Number	Percentage
Male	13	43.3	14	46.6
Female	17	56.6	16	53.3
Total	30	100	30	100

6. DISCUSSION

The present study was conducted to compare postoperative analgesic efficacy of nebulised fentanyl with that of intravenous fentanyl in dose of 4mcg/kg and 1 mcg/kg respectively in abdominal surgeries by using VAS score. For this purpose total 60 patients divided in two groups (group S and group C) containing 30 patients each undergoing lower abdominal surgery were selected. Patients belonging to group S had received nebulised fentanyl (4 mcg/kg) and IV saline whereas patients belonging to group C had received intravenous fentanyl (1 mcg/kg) and nebulised saline.

It was observed that majority of the patients in the present study were in the age group of 31-40 years (46.6% in group C and 53.3% in group S). The age distribution was comparable with the distribution observed by Bartfield et al. [12], Singh et al. [13], Saranya et al. [11], Ershad et al. [14], Higgins et al. [15] and Worsley et al. [16].

7. CONCLUSION

Our trial showed that post operatively both the drugs were effective in giving pain relief. 4 mcg/kg nebulised fentanyl produces significant lower pain scores for prolonged time as compared to 1 mcg/kg intravenous fentanyl (90 mins vs 30 mins) and with minimal side effects. Thus the nebulised fentanyl is an effective, safe and convenient method of analgesia.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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