Research Article

Efficacy of Low Dose Fentanyl in the Treatment of Severe Pain.

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ABSTRACT

Fentanyl, a potent synthetic opioid pain medication is 50-100 times more potent than Morphine. It is commonly used as surgical premedication, general anesthesia and analgesia. For severe pain, the usual recommended dose is 50-100mcg/hr. Fentanyl use can lead to addiction, abuse or misuse even in recommended doses for people with history of substance abuse or mental illness. Increased mortality rate have also been reported due to improper medical use of the drug. Wong-Baker pain scale, a pain measurement scale used to quantify pain intensity and enables to determine the efficacy of treatment aimed at reducing pain. The objective is to study the efficacy of low dose Fentanyl in patients with severe pain in a tertiary care hospital in India. Here we conducted a retrospective observational study extending over a period of 6months. Adult patients treated with Fentanyl according to standard dose protocol approved by our hospital, who satisfied all the inclusion and exclusion criteria were selected for the study. Out of these 75 patients, majority of the patients i.e., 32% (24/75) were treated with 20-40mcg/hr dose of Fentanyl, 23% 40-60mcg/hr, 12% with 60-80mcg/hr, 5% with 80-100mcg/hr, 5% with 100-120mcg/hr, 7% with 120-140mcg/hr, 4% with 140-160mcg/hr, 5% with 160-180mcg/hr,4% with 180-200mcg/hr and 5% with 200-220mcg/hr. Low dose of Fentanyl i.e., 20-40mcg/hr is effective for the treatment of severe pain and also thereby we can reduce the adverse effects and mortality due to improper medical use of the drug.

Keywords: Fentanyl, Pain assessment, Wong-Baker pain scale.

INTRODUCTION

Fentanyl, a potent synthetic opiod pain medication, which was first made by Paul Janssen in 1960, has rapid onset and short duration of action.[1] It acts by binding to nervous system proteins known as opiod receptor and thereby blocks the transmission of pain signals to the brain. Compared to Morphine, Fentanyl is 50 to 100 times more potent and some fentanyl analogues are even 10,000 times more potent than morphine.[2] Fentanyl is commonly used as surgical premedication, general anesthesia and analgesia. For severe pain the usual recommended dose is 50-100mcg/hr and even higher doses may be tolerated by patients who have prior opiod exposure. The most common adverse effects of Fentanyl include drowsiness, dizziness, headache, sedation, dehydration, constipation, vomiting, weakness and dyspnoea.[3, 4]

The relatively wide therapeutic index of Fentanyl makes it a very safe surgical anesthetic when monitored carefully, however; fentanyl use can lead to addiction, abuse or misuse even in recommended doses for people with history of substance abuse or mental illness. Fentanyl overdose may leads to breathing difficulty, extreme sleepiness, difficulty in thinking, talking or walking, contracted pupil, dizziness, confusion and coma.[5] Like other addictive drugs, stopping fentanyl suddenly may result in withdrawal symptoms like, muscle, joint and back pain, sweating and chills, teary eyes and runny nose, irritability, weakness, palpitation, etc. Due to the use of Fentanyl as recreational drug, around thousands of deaths were reported due to over dosage from 2000 to 2017. Increased mortality rate have also been reported due to improper medical use of the drug.[6]

Pain assessment is crucial if pain management is to be effective. Pain measurement quantifies pain intensity and enables to determine the efficacy of interventions aimed at reducing pain. Pain assessment should be done before and after the intervention done to reduce pain.[7] Wong-Baker faces pain scale used self-report of pain to assess a patient's experience of pain. This scale developed by Donna Wong and Connie Baker, shows faces ranging from a happy face at score 0, "No pain" to a crying face at score 10 "Worst pain". Ask the patient to choose the face that best depicts the pain they are experiencing.[8]

MATERIALS AND METHODS

Here we conducted a retrospective observational study extending over a period of 6months at Amrita Institute of Medical Sciences, Kochi, and a 1800 bedded tertiary care hospital. The study was started after getting approval from the Research and Ethics Committee. The patients who came to Emergency medicine department of our hospital with severe pain and treated with Fentanyl according to standard dose protocol approved by our hospital and those satisfying the inclusion-exclusion

criteria were selected for the study. All the patients below 18yrs and pregnant and lactating women were excluded from the study. Also the patients who are allergic to Fentanyl were excluded from the study.

In our study, patients who came to emergency medicine department with severe pain like abdominal pain, severe headache, chest pain, body pain, trauma injury and severe pain due to other causes with pain score between 7 to 8 according to Wong-Baker faces pain scale were treated with Fentanyl according to standard dose protocol approved by our hospital. Fentanyl dosing was based on the amount of drug required to completely relieve the pain i.e., to reduce pain score from 7-8 to 0-1. The dose requirement of Fentanyl for each patient varied from a minimum of 10mcg/hr to a maximum of 200mcg/hr. The outcome i.e., the efficacy of Fentanyl was determined using pain assessment score. The pain assessment using Wong-Baker face pain scale was done even after the treatment with Fentanyl to assess its efficacy in reducing pain i.e., to reduce pain score to 0-1. The dose of Fentanyl required to reduce the pain from 7-8 to 0-1 was noted.

The patient data relevant to the study like demographic details of the patient, indication for use of Fentanyl and its dose were obtained using electronic database (Amrita Hospital Information System). The data were analyzed and compared with data from other studies. The data collected were compiled using Microsoft excel and were presented in tables and graphical formats. To obtain the characteristics of categorical variables, percentages and frequencies were applied.

RESULT AND DISCUSSION

A total of 75 patients treated with Fentanyl were used for the study. Out of these 75, 53% (40/75) were males and 47% (35/75) were females. As shown in Figure 1, Fentanyl was used for the treatment of abdominal pain in 36% (27/75), headache in 12% (9/75), chest pain in 13% (10/75), body pain in 11% (8/75), trauma injury in 16% (12/75) and pain due to other causes in 12% (9/75). Pain assessment was done for all patients before and after the treatment with Fentanyl. The dose at with which the pain score reduced from severe pain "7-8" to no pain "0-1" was noted. For example: Before treatment with Fentanyl the patient's pain score was 8 i.e., severe pain and after the treatment pain reduced to score 0-1 i.e., no pain and the dose with which the pain reduced was noted. Out of these 75 patients, majority of the patients i.e., 32% (24/75) were treated with 20-40mcg/hr dose of Fentanyl, 23% of patients (17/75) were treated with 40-60mcg/hr, 12% of patients (9/75) with 60-80mcg/hr, 5% of patients (4/75) with 80-100mcg/hr, 5% of patients (4/75) with 100-120mcg/hr, 7% of patients (5/75) with 120-140mcg/hr, 4% of patients (3/75) with 140-160mcg/hr, 5% of patients (4/75) with 160-180mcg/hr,4% of patients (3/75) with 180-200mcg/hr and 3% of patients (2/75) with 200-220mcg/hr, which shows that in most of the patients, the severe pain was reduced to no pain, score 0-1 with low dose of Fentanyl, 20-40mcg/hr (Figure 2).

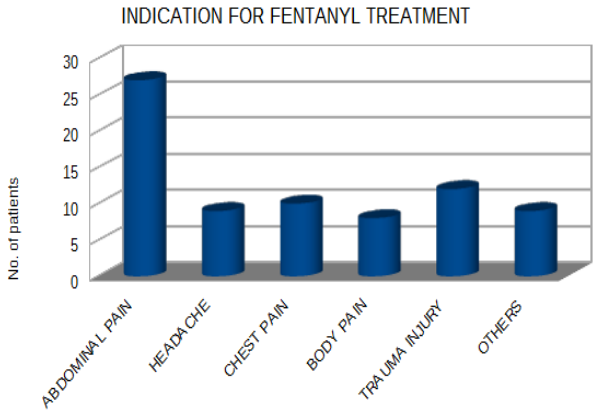

Figure 1: Indication for Fentanyl treatment.

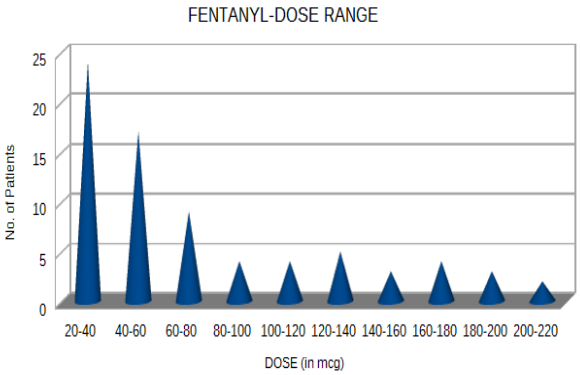

Figure 2: Dosing range of Fentanyl in the treatment of severe pain.

CONCLUSION

In our study, a total of 75 patients who came to Emergency medicine department with severe pain treated with Fentanyl according to standard dose protocol in our hospital were included. Pain assessment was done for all patients using Wong-Baker face pain scale before and after treatment with Fentanyl. This pain assessment tool quantifies pain intensity and enables to determine the dose efficacy of Fentanyl aimed at reducing pain. The dose of Fentanyl required to reduce the pain score from 7-8 to 0-1 was noted. Though the dose requirement of Fentanyl for each patient varied from a minimum of 10mcg/hr to a maximum of 200mcg/hr, most of the patients i.e., 32% (24/75) were treated with low dose of Fentanyl, 20-40mcg/hr. The main drawback associated with the use of Fentanyl is its adverse effects, addiction, abuse or misuse and related withdrawal symptoms. From our study, we came to a conclusion that low dose of Fentanyl is effective for the treatment of severe pain and also thereby we can reduce the adverse effects and mortality due to improper medical use of the drug. A prospective and multi-centered analysis should be done further to assess and establish its safety and efficacy at low dose.

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