

## Respiratory Arrest caused by abuse of Fentanyl Patch: A Case Report

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### ABSTRACT

Fentanyl is a pure and selective  $\mu$  opioid receptor agonist that was discovered to identify an improved analgesic over morphine, an opioid frequently associated with histamine-release, bradycardia, hyper- or hypotension, and prolonged postoperative respiratory depression. It is 80-100 times more potent and has less adverse effect than morphine. The formulations are intravenous, transmucosal, and transdermal. Besides its efficacy, the transdermal route is safe, since with it the plasma concentration of fentanyl can be adequately maintained at a steady level. Transdermal fentanyl patch has been increasingly used recently for the management of chronic pain. This brings about increased rates of misuse or addiction in general population. Transdermal fentanyl patch may produce respiratory arrest as all other opioids do. Herein, we describe a woman with meperidine dependence who developed respiratory arrest after cutaneous application of 4 transdermal fentanyl patches, with relevant literature review.

**Key Words:** Abuse, Fentanyl Patch, Respiratory Arrest

## INTRODUCTION

Fentanyl, a derivative of synthetic opium, has been discovered in Belgium in 1950 and it has been used for the first time in 1972 in United States of America.<sup>[1]</sup> Nowadays, this drug is the most preferred analgesic from the opioid group for the treatment of pain management during surgical operations. Fentanyl is a strong drug that has a low molecular weight, is fat soluble and may be absorbed via skin and mouth mucosa. In United States of America, the utilization of fentanyl as transdermal patch has been started in 1991.<sup>[2]</sup> The compatibility of the patient, the reduced side effects, and the absence of negative effects on the patient's quality of life made this product used widely.<sup>[3]</sup> The frequent utilization of this drug led to misuse and even to addiction, and thus to utilization out of therapeutic aim.<sup>[4]</sup> In this study, we proposed the case of a patient who developed respiratory arrest following the utilization of 4 fentanyl patches out of therapeutic aim.

## CASE REPORT

A 26 year-old female patient has been found unconscious in her room by her relatives and was transferred to the emergency unit by their own means. The respiration has been associated to a mechanical ventilator by intubating the patient because of her unconsciousness. While the patient's clothes were removed, 4 fentanyl 10 mg transdermal patches were observed on her abdominal region and those were immediately removed. The incoming brachial tension arterial was 85/55 mmHg, heart rate was 120 /minutes, fever was 36.5° C axillary. No light reflex was observed in systemic physical examination and there was a spot pupil. The Glaskow coma scale (GKS) was 3 (E1V1M1). In the electrocardiography, there was no other pathology than a sinus tachycardia at a rate of 120/ minutes. No pathology was observed in brain tomography. The relatives explained that the patient was a nurse in a private medical care center, that she had severe headache approximately 9 months ago, and that one of her nurse friend applied to her on dose of intramuscular drug containing

meperidin, and that our patient always asked for that drug. Besides, 2 weeks ago, our patient has been suspended from the hospital where she was working because the stock of drug decreased due to her 5-6 weekly doses. As she could not get meperidin, the patient used 4 transdermal fentanyl patches with a 100 µ/ hour release rate from one of her relatives having a cancer treatment. The patient has been transferred to intensive care unit. She was monitored in SIMV-VC mode of the mechanical ventilator and woke up after 16 hours. She was monitored for 8 hours in intubated state after she woke up, and then was extubated. After 48 hours in intensive care unit, the patient who did not present any complication has been transferred to the psychiatric unit.

## DISCUSSION

Nowadays, morphine and fentanyl, which is a newly developed synthetic group member are widely used and easily prescribed, thus leading to serious health problems.<sup>[5]</sup> Fentanyl transdermal products are frequently used for pain management in cancer patients, especially in chronic pain treatment. Fentanyl transdermal system may provide a 72 hours pain control with regular absorption. In Turkey, 2.5, 5, 7.5, and 10 mg versions of the drug are on sale and provide release at 25, 50, 75, 100 µ/hour.<sup>[6]</sup> In our patient, 4 fentanyl 10 mg transdermal patches with a 100 µ/hour release rate were observed on her abdominal region. Fentanyl, like other opium derivatives, may lead to side effects such as the inhibition of central nervous system, loss of consciousness, respiratory depression, hypotension, bradycardia, hypothermia.<sup>[7]</sup> In our case also, the patient developed nervous system inhibition, coma (GKS:3) and respiratory arrest. The blasting of the transdermal system, the utilization of too many patches, the inhalation, the suction of this drug may lead to toxicity.<sup>[8,9]</sup> In literature, cases of death due to oral absorption of transdermal system or many patches at 100 µ/hour rate have been observed.<sup>[4,9,10]</sup> The active utilization of fentanyl transdermal system in our country only for the last 10 years may explain the absence of such cases. The only case of

transdermal fentanyl misuse or addiction declared in our country is the fentanyl transdermal system addiction from Geçici et al.<sup>[11]</sup>

## CONCLUSION

As a result, in spite of the frequent use of a drug due to its reliability, few side effects, patient compatibility and comfort, transdermal fentanyl systems may lead to important health troubles, misuse and addiction. We wanted to emphasize on the importance of total body examination and relatives interrogation about the fentanyl patch utilization in patients applying to emergency unit for respiratory arrest.

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