Acute Atrial Fibrillation Derived by Single-Doze Fentanyl Transdermal Usage

Tek Doz Transdermal Fentanil Kullanımına Bağlı Gelişen Atriyal Fibrilasyon

Fentanilile Bağlı Atriyal Fibrilasyon / Fentanyl-Derived Atrial Fibrillation

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Özet

Anahtar Kelimeler
Aritmi; Atriyal Fibrilasyon; Fentanyl Transdermal

Abstract
Fentanyl is a selective and synthetic opiate agonist. Especially in cancer-derived pain treatment fentanyl transdermal usage is preferred. Clinic impacts occur related to several systems derived by fentanyl usage. However, respiratory failure, hypothermia and bradycardia are observed the most. In this article, we aimed at presenting a case which developed atrial fibrillation derived by single-dose fentanyl transdermal usage.

Keywords
Arrhythmia; Atrial Fibrillation; Fentanyl Transdermal
Introduction
Fentanyl is a selective and synthetic opiate agonist with high affinity to \( \mu \)-receptors. Since fat-solubility is high, it quickly passes blood-brain barrier. With this characteristic, its pain killing power is 75-100 times more than morphine. It can be used through oral, intravenous, epidural, transdermal (TTS), intranasal and transmucosal ways in acute and chronic pain treatment. Due to its low molecular weight and lipophilic structure, its transdermal usage is preferred especially in patients with cancer. It has TTS preparations of twenty five, 50, 75, 100 mcg/ hour. Its effect is at maximum level in the blood on the first day, it continues by descending on the second and third day and it is effective for seventy two hours[1,2]. Clinic impacts can occur about several systems depending on fentanyl usage. The most frequently occurring impacts regarding cardiovascular system are peripheral vasodilatation, orthostatic hypotension and bradycardia [3]. Clinical reports indicate that an increasing number of cardiovascular (adenosine, positive inotropics) and non-cardiovascular (cancer chemotherapy, non-steroidal anti-inflammatory agents, high-dose methylprednisolone, and several respiratory medications) drugs can induce AF, increasing the number of hospitalizations[4]. Atrial fibrillation derived by fentanyl usage is not informed sufficiently in the literature. Here we aimed at presenting a case that developed atrial fibrillation depending on single dose 50 mg fentanyl TTS usage.

Case Report
Thirty-six year old female patient adhered the 50 mg transdermal fentanyl plaster (50 mg Durogesic TTS\textsuperscript{\textregistered}), which was prescribed for the treatment of the pains derived by the breast cancer of her mother, to her left arm triceps muscle localization with the aim of reducing her pains derived by dysmenorrhea. About 10 minutes later she instantly took the transdermal plaster off due to palpitation and weakness. Since her complaints continued, she resorted to our emergency service 45 minutes later. In the history of the patient, it was learned that she didn't have a continuous disease, she didn't use any drugs, she didn't have food or drug allergy. In the physical examination, her conscious was open, pupils were isochoric, Glasgow Coma Scale was 15. Axillary fever was 36.5°C, respiratory rate was 20/min, oxygen saturation with pulse oxymetry was 98%, pulse rate was 134 pulse/min, but irregular. Arterial blood pressure was found as 110/80 mmHg. In cardiac auscultation pulses were arrhythmic and there was no murmur. There was high ventricle rate 134 pulse/min, but irregular. Abdominal auscultation revealed normal bowel sounds. On physical examination, the patient was conscious, her respiratory rate was 20/min, oxygen saturation with pulse oxymetry was 98%, pulse rate was 134 pulse/min, but irregular. Arterial blood pressure was found as 110/80 mmHg. In cardiac auscultation pulses were arrhythmic and there was no murmur. There was high ventricle rate 134 pulse/min, but irregular. Abdominal auscultation revealed normal bowel sounds.

Discussion
Fentanyl is used alone or in combination with other preparations in several clinic cases that require pain control, especially at emergency services, intensive care units and in anesthesia applications. It is used in acute or chronic pain treatment. Several clinic impacts and side effects may develop depending on fentanyl. The most frequent side effect is respiratory depression, hypotension and bradycardia[5]. There is no sufficient publication in the literature that indicates that fentanyl, which is known to cause tachycardia or bradycardia, causes atrial fibrillation. Periaut R et al. informed that atrial fibrillation developed during anesthesia performed with fentanyl and pentobarbital on german dogs[5]. Atrial fibrillation is the most frequently observed arrhythmia that causes hemodynamic disorders and ischemic stroke. Atrial fibrillation is clinically significant as it causes increase in the risk of ischemic stroke and systemic emboli. Atrial fibrillation is related to morphological changes in the atrial myocardium. Vascular changes in sinus and atroventricular nodes; underlying diseases such as necrosis, cell infiltration, fatty metamorpho-
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Sis, fibrosis and calcification and acute and chronic inflammatory changes cause enlarging of the myocardium and structural changes and these changes in the atrial myocardium are held responsible for AF formation[6]. Advanced age, cardiac insufficiency, smoking, diabetes, hypertension, male gender, left ventricle hypertrophy, myocardial ischemia due to coronary vasoconstriction/thrombosis, pulmonary disease, heart valve disease and hyperthyroidism is deemed to cause increase in AF risk. Alcohol usage, stress, excessive coffee consumption, surgery, myocarditis, pulmonary emboli are reasons of acute temporary AF[7]. Drug induced AF is reported to have the following main mechanisms: adrenergic or vagal stimulation, direct cardiotoxicity, changing atrial conduction, refractoriness or automaticity, coronary vasoconstriction/ischemia, and electrolyte disturbances[4].

Conclusion
It should be remembered that development of atrial fibrillation derived by fentanyl TTS usage and its turning into sinus rhythm spontaneously can cause arrhythmias such as atrial fibrillation like in making respiration monitoring with pulse oximetry when the very frequently used fentanyl TTS is used through intravenous or other ways. 12-derivation electrocardiograph and cardiac monitoring should be used for following up the patients.

Competing interests
The authors declare that they have no competing interests.

References