CASE REPORT

Life-threatening opioid toxicity from a fentanyl patch applied to eczematous skin

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SUMMARY

A 19-year-old man with a history of eczema was admitted to the emergency department following collapsing at home. The paramedics found him unresponsive with poor respiratory effort and a widespread erythematous rash. Anaphylaxis, thought to be secondary to flucloxacillin he had recently been prescribed, was diagnosed. Epinephrine, steroids and antihistamines were administered without clinical improvement. On arrival to hospital, constricted pupils were noted prompting the emergency physicians to consider opiate toxicity. Intravenous naloxone brought about an immediate recovery. His father subsequently disclosed that he had given his son one of his own fentanyl patches to alleviate the distressing symptoms of eczema. Although the patient had removed the patch prior to collapsing, he had suffered life-threatening opioid toxicity likely due to enhanced opiate absorption through eczematous skin. This case highlights the risks associated with fentanyl patches in patients with chronic skin conditions.

BACKGROUND

Transdermal fentanyl patches are commonly used in the management of chronic pain. They are non-invasive, easy to administer and provide effective, long-lasting analgesia. Their use, however, is not without risk. In 2008, the Medicines and Healthcare Regulatory Agency (MHRA) issued a warning to all health professionals in the UK regarding the use of fentanyl patches following reports of toxicity after accidental exposure in children, dosing errors and increased absorption in the presence of heat.¹ This case highlights for the first time the significant risk associated with the use of fentanyl patches in patients with chronic skin conditions such as eczema, where impaired skin defences may lead to enhanced drug absorption and potentially life-threatening opiate toxicity.

CASE PRESENTATION

A 19-year-old man with a history of severe eczema was admitted to the emergency department following a collapse at home. He had been suffering from a flare of his eczema with superadded infection and had been taking a course of oral flucloxacillin prescribed by his general practitioner. Despite suffering from pain and pruritus associated with his eczema, however, he had been systemically well. He had no other significant medical history, was a non-smoker and consumed minimal alcohol. Other than the acute course of flucloxacillin, he was not

taking any other medication and had no documented drug allergies. He denied recreational drug use.

An ambulance was called to the family home after his brother found him unresponsive on the floor. On arrival of the paramedics, the patient was Glasgow Coma Scale (GCS) 3 with a recorded pulse between 30 and 40 bpm and respiratory rate of 4 breaths/minute. He was described as having a 'widespread blotchy rash and swollen face'. Owing to this clinical appearance, together with a history of recent flucloxacillin ingestion, anaphylaxis was diagnosed and he was administered epinephrine, steroids and antihistamines. After minimal clinical improvement an emergency medical response team was called due to concern about securing the patient's airway. Following a repeat dose of epinephrine he was urgently transferred to the emergency department. On arrival to hospital, the patient remained GCS 3 with a pulse of 100 bpm, blood pressure of 100/60 mm Hg and respiratory rate of 12 breaths/minute. His blood sugar and temperature were normal. He was noted to have constricted pupils prompting the emergency doctors to consider opiate toxicity. The patient's family members were questioned about recreational drug use and other prescribed medications but no clear history of opiate ingestion could be established.

TREATMENT

The patient was treated with intravenous naloxone and made an immediate and complete recovery. After discussion with the patient and family it emerged that his father had given him one of his own 12 µg fentanyl patches, which he had been prescribed for chronic pain associated with ankylosing spondylitis. The father's intention was to help his son cope with the distressing symptoms associated with eczema. The patient had removed the patch shortly before collapsing prior to the ambulance being called.

OUTCOME AND FOLLOW-UP

The patient was admitted to the toxicology ward and made a complete recovery requiring no further naloxone. He was reviewed by the toxicology and psychiatry teams who agreed that he had suffered a non-intentional opiate overdose secondary to enhanced absorption through eczematous skin. He was also reviewed by the dermatologists to optimise his eczema treatment. The patient was subsequently discharged with dermatology follow-up and has since recovered completely from this flare of eczema. The patient and his family were educated

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about the risks of sharing prescription medication and the use of fentanyl patches.

DISCUSSION

Fentanyl, a potent synthetic opioid, is commonly administered via a transdermal patch to provide effective, non-invasive analgesia in the management of chronic pain.² Following application to intact skin, therapeutic concentrations are reached in 1.2–40 h with steady state being achieved after 48–72 h.³ With a terminal half-life of approximately 25 h, serum concentrations reduce over the second and third day after application, necessitating renewal of the patch every 72 h to maintain therapeutic analgesia.²

Despite widespread use, particularly in the community setting, fentanyl patches are not without risk. Opioid toxicity has been reported when the patch was used in the presence of heat.^{4 5} This was likely due to increased microcirculation permeability aiding drug transfer into the systemic circulation resulting

in an opiate overdose. Toxicity has also been reported following accidental exposure in children and dosing errors in adults.¹

To the best of our knowledge, there have been no previous case reports of opioid toxicity from the use of fentanyl patches in the presence of chronic skin conditions such as eczema, where the natural barrier mechanism of the skin may be impaired leading to increased permeability and drug absorption.⁶ It is likely the patient described suffered opioid toxicity as a result of enhanced absorption of fentanyl through impaired skin defences. Greater education and awareness of the risks of fentanyl patches, particularly in patients with chronic skin conditions, is required among health professionals and patients.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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Learning points

- Fentanyl patches provide effective non-invasive analgesia, but their use is not without risk of severe opioid toxicity.
- Patients with chronic skin conditions such as eczema may be at increased risk of opiate toxicity due to enhanced drug absorption.
- Greater awareness of the risks of fentanyl patches, particularly in patients who may experience enhanced absorption, is required.

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