# Inhaled heroin causing a life-threatening asthma exacerbation and marked peripheral eosinophilia

## Introduction

This article reports two patients admitted with acute asthma temporally related to the inhalation of heroin, highlighting a problem that requires early identification and a major change in the management of opiate misuse. The high prevalence of asthma and changing patterns of heroin use should lead physicians to consider inhaled heroin as a trigger for asthma exacerbation in all cases, particularly if there is sudden onset and a marked peripheral eosinophilia.

Opiate-induced bronchoconstriction was first identified over 100 years ago and is thought to relate to airway irritation, mast cell degranulation and histamine release (Withington et al, 1993; Tashkin, 2001). Oliver reported the first case of bronchospasm following heroin inhalation in 1986 and subsequent publications have identified the potential severity of acute asthma following inhalation or insufflation of heroin (Hughes and Calverley, 1988; Cygan et al, 2000; Krantz et al, 2003).

## Discussion

Both cases highlight the relationship between heroin inhalation and acute asthma. Heroin inhalation should be considered as the potential cause of acute severe asthma in all patients. It is important to actively seek this with direct questions and then try to help the patient stop the habit, as this is the only way to prevent further exacerbations. It is also worth considering heroin insufflation (snorting), which is increasingly popular among young users of high purity heroin and has triggered life-threatening asthma exacerbations (Krantz et al, 2003).

The importance of the relationship between heroin and asthma was shown by Levine et al (2005), who found that during an acute asthma exacerbation, intubation rates were higher among heroin users than non-users. Heroin causes respiratory depression, mast cell degranulation and histamine release, and reports suggest that asthma exacerbations following heroin inhalation can have a particularly rapid onset and be less responsive to standard treatments. Heroin users admitted with asthma exacerbations were generally younger than non-drug users and more likely to be male and African-American (Levine et al, 2005).

A diagnosis of asthma and bronchial hyperreactivity was found to be more prevalent among subjects who inhale heroin mixed with cocaine (Boto de los Bueis et al, 2002). The mechanism for the increased airway responsiveness is unknown, and may be caused by one or both drugs, or a synergistic effect between the two.

The National Drug Treatment Monitoring System has reported increasing heroin use in recent years and although a wide range of interventions are effective at reducing drug misuse, much of the UK has limited treatment options, with lengthy waits for access and underdeveloped services.

### Case Report 1

Miss H was born in 1982 and diagnosed with asthma at the age of 7 years. In 2004 she presented with cough and wheeze, a peak flow of 55% predicted, an eosinophil count of 3.75 x $10^9$/litre (normal range 0–0.4 x $10^9$/litre) and a normal chest radiograph. In the preceding year, she attended the accident and emergency department twice and required six courses of prednisolone, despite taking low-dose inhaled steroids on a regular basis. A smoker, she lived in a rented room and was not registered with a doctor. Following standard treatment, she was prescribed an inhaled corticosteroid and long-acting β2-agonist. She took discharge against medical advice and failed to attend follow-up clinic.

Two months later she was admitted with increasing wheeze and breathlessness, but refused investigations. During this admission, but only after direct questioning, she admitted to smoking heroin. She was discharged with community drug liaison service follow-up and abstained from heroin until she attended clinic 6 weeks later. At this point she had no symptoms and a supranormal peak flow.

In February 2005, she become wheezy after inhaling heroin and was admitted overnight. She took her own discharge before seeing the hospital drug liaison team and again refused investigation. Admissions followed in June, July and August 2005, with life-threatening features on the last occasion, when she narrowly avoided ventilation. During this admission she recognized that exacerbations always followed heroin inhalation and she was referred to a direct access clinic to commence oral buprenorphine (Subutex, Schering-Plough, NJ, USA), a partial opioid antagonist.

### Case Report 2

Mr J was diagnosed with asthma as a teenager. His first admission was at 22 years of age with breathlessness and palpitations. His peak flow rate was 45% predicted, eosinophil count 2.12 x $10^9$/litre and the chest radiograph was clear. He had a normal erythrocyte sedimentation rate and immunoglobulins and a negative antineutrophil antibodies screen. He lived alone in a flat, with no pets. On further questioning, he admitted to inhaling heroin.

Over the subsequent 5 years, he had over twenty acute admissions, with two periods of mechanical ventilation and further admissions to a high dependency bed. On eleven occasions the eosinophil count was markedly raised. Admission was often preceded by inhalation of higher than normal amounts of heroin or inhalation following a period of abstinence.

Despite regular consultation with drug services, he graduated to intravenous heroin use. During his most recent admission he commenced buprenorphine under supervision and has not had a severe attack since.

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Drug rehabilitation services support individuals with addiction and use various methods to reduce the risks associated with heroin use, including reducing the quantity and/or frequency of drug use and changing the route of administration. One strategy encourages less invasive methods of self-administration, including preferential use of inhaled heroin. It is critical that this approach is avoided in asthmatics or those with a history of wheeze or atopy.

It is crucial that heroin inhalation or insufflation is identified as the cause of admission and a multidisciplinary approach is adopted, in order to manage the opiate misuse problem and prevent further asthma exacerbations. BJHM


Boto de los Bueis A, Pereira Vega A, Sanchez Ramos JL, Maldonado Perez JA, Averbe Garcia R, Garcia Jimenez D, Pujol de la Llave E (2002) Bronchial hyperreactivity in patients who inhale heroin mixed with cocaine vaporized on aluminium foil. *Chest* **121:** 1223–30

Cygan J, Trunsky M, Corbridge T (2000) Inhaled heroin-induced status asthmaticus. Five cases and a review of the literature. *Chest* **117:** 272–5

Hughes S, Calverley PMA (1988) Heroin inhalation and asthma. *BMJ* **297:** 1511–12

Krantz AJ, Hershow RC, Prachand N, Hayden DM, Franklin C, Hryhorczuk DO (2003) Heroin insufflation as a trigger for patients with life-threatening asthma. *Chest* **123:** 510–17

Levine M, Iliescu ME, Margellos-Anast H, Estarziau M, Ansell DA (2005) The effects of cocaine and heroin use on intubation rates and hospital utilization in patients with acute asthma exacerbations. *Chest* **128:** 1951–7

Oliver RM (1986) Bronchospasm and heroin inhalation. *Lancet* **i:** 915

Tashkin DP (2001) Airway effects of marijuana, cocaine, and other inhaled illicit agents. *Opin Pulm Med* **7:** 43–61

Withington DE, Patrick JA, Reynolds F (1993) Histamine released by morphine and diamorphine in man. *Anaesthesia* **48:** 26–9


## IMAGES IN MEDICINE

# Combined Morgagni hernia and paraoesophageal hernia

An 85-year-old woman presented with chronic constipation. She also complained about recent chest discomfort. Abdominal examination was unremarkable. Plain chest radiography showed an abnormal opacity in the right anterior lower thorax (*Figures 1* and *2*). Subsequent contrast-enhanced computed tomography of the thorax (*Figure 3*) revealed herniation of the transverse colon and mesocolon through the foramen Morgagni into the anterior thorax. A coexisting paraoesophageal hiatal hernia was also noted. Because of the mechanical symptoms and risks of strangulation, surgical repair was recommended, but the patient refused surgery.

Morgagni hernias are rare, formed at the sternocostal junction of the diaphragm anteriorly. Although thought to be congenital, they usually present in adults. Most are right-sided, and the most common contents of the hernias are omentum and colon. They are usually asymptomatic, or may present with non-specific symptoms like chest discomfort and constipation. Complications like incarceration and strangulation can occur. Paraoesophageal hiatal hernias usually occur in the elderly and account for about 10% of all hiatal hernias. Similar to Morgagni hernias, they may develop life-threatening complications like intrathoracic gastric volvulus and strangulation and thus early recognition and prompt surgical treatment is necessary.

The simultaneous occurrence of Morgagni hernia and paraoesophageal hernia is very rare and only a few cases are reported (Eroglu et al, 2003). BJHM


Eroglu A, Kurkcuoglu IC, Karaoglanoglu N, Yilmaz O (2003) Combination of paraesophageal hernia and Morgagni hernia in an old patient. *Dis Esophagus* **16:** 151–3


***Figure 1. Chest radiograph (posteroanterior view) showing an opacity in the right lower thorax.***

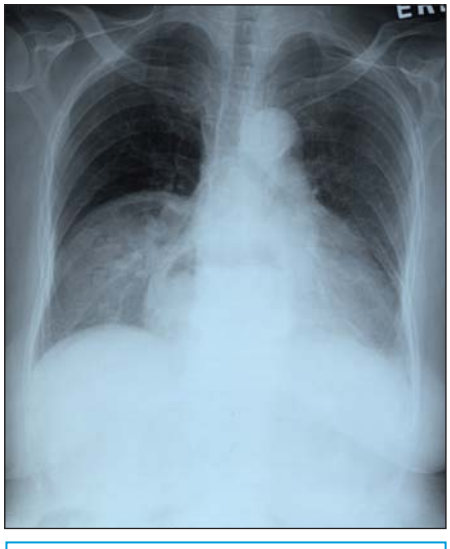

***Figure 2. Chest radiograph (lateral view) showing the anterior location of the opacity in the right lower thorax.***

***Figure 3. Contrast-enhanced computed tomography of the thorax showing herniation of the transverse colon and mesocolon through the foramen Morgagni into the anterior thorax. A coexisting paraoesophageal hiatal hernia was also noted.***


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