More on the idiosyncratic effects of cocaine on the human heart

Recreational cocaine use in the US is widespread, affecting more than 30 million people. Cocaine is responsible for more emergency department visits and hospital admissions than any other drug.¹ Owing to its ability to interfere with the sodium channel, cocaine intoxication is often associated with electrocardiographic changes, indicative of acute myocardial ischaemia with ST segment elevation and other ST changes, ventricular tachycardia, fibrillation and various degrees of conduction abnormalities.

Cocaine enhances arrhythmogenesis under conditions of excessive sympathoadrenal activity. The occurrence of cocaine-induced electrocardiographic abnormalities is highly variable in humans, and has been described as an idiosyncratic response to cocaine. The incidence of cocaine-related arrhythmias is likely to be substantially under-reported, as many cocaine-induced cardiovascular symptoms are not classified as such. Although cocaine use has been associated with adverse events in nearly every organ system, cardiovascular complications account for most cocaine-related deaths.

Clinically, cardiovascular complications of cocaine intake are manifested as hypertension, tachyarrhythmias, aortic dissection, cardiomyopathy, accelerated coronary artery disease, myocardial ischaemia, myocardial infarction and sudden cardiac death observed in healthy individuals without any structural heart disease.²

Currently, no specific treatment is available for cocaine-induced cardiac arrhythmias. β -adrenergic blockers should be avoided as they may precipitate cocaine-induced coronary spasms. Arrhythmia drugs that prolong the QT interval should be avoided. Calcium channel blockers have been shown to prevent cocaine-induced ventricular arrhythmias, and may be useful. Intravenous administration of benzodiazepines, sodium bicarbonate and magnesium may be beneficial. Lidocaine should be used with caution as it may lower the seizure threshold.

It is with interest that I read the article by Arnaldo *et al.*,³ which highlights two important learning points regarding emergency care of patients who misuse cocaine: firstly, unpredictable idiosyncratic cardiovascular response to cocaine and, secondly, lack of well-established treatment guidelines (eg, when and how to manage the airway).

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Figure 1 Numbers of skull x rays (SXR) and computed tomography (CT) scans of the head at West Suffolk Hospitals from 1995 to 2005. Correlation with publication of guidelines. NICE, National Institute for Health and Clinical Excellence; RCSE, Royal College of Surgeons of England.

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Latency of guideline effects: National Institute for Health and Clinical Excellence and other contributors to head injury management

In 1999, the Royal College of Surgeons updated the guidelines on the management of patients with head injury first issued in 1986.^{1,2} Prior to this, several other societies in the UK and elsewhere had released similar guidelines, preceded by research in Canada. National guidelines should lead to change of patient management.³ The latency of guideline effects was recently shown by a report in this journal.⁴ Repeatedly revised guidelines, local adaptation and repeated local audit on management of patients with head injuries effectively changed the practice on skull radiography and computed tomography scanning of the head in our 450-bed district general hospital.

However, in accordance with previous reports, this did not reduce or increase costs in the radiology department to date.⁵ The introduction of the National Institute for Health and Clinical Excellence (NICE) Head Injury guidelines in June 2003 led to further decrease in the use of skull radiography and effectively reduced them to 6% of all investigations undertaken for head injury patients compared with 1995.⁶

The NICE guidelines on the use of computed tomography scans of the head were not fully implemented. A written local approach was founded on the basic principles of the updated guidelines. Less computed tomography scans of the head were performed than would be predicted by NICE guideline criteria, as demonstrated by a departmental audit. During a 5-month period, 53% of patients fulfilled the criteria for a computed tomography scan of the

head, but only 23% received this investigation. Similar approaches and results have been already reported in this journal.⁵ Now, 2 years after publication of the NICE guidelines and 6 years after publication of the revised Royal College of Surgeons of England guidelines, finally, it is possible to say that skull radiography is no longer considered a useful screening tool for head injury among medical staff of our hospital (fig 1).

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