

Sudden death in cocaine abusers: Study reveals the role played by the illegal drug

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Forensic pathologists have shown that over three per cent of all sudden deaths in south-west Spain are related to the use of cocaine. They believe their findings can be extrapolated to much of the rest of Europe, indicating that cocaine use is a growing public health problem in Europe and that there is no such thing as "safe" recreational use of small amounts of the drug.

The study published in Europe's leading cardiology journal, the [European Heart Journal](#) [1] today (Wednesday 13 January), carefully investigated all the circumstances surrounding a consecutive series of sudden deaths between 2003 and 2006. During post-mortems the pathologists tested blood and urine for traces of toxic substances, and studied the organs, focusing on the [cardiovascular system](#) and toxicological analysis; they also gathered information on substance abuse prior to death, the circumstances of the death and death scene investigations.

Out of 668 sudden deaths during the study period, 21 (3.1%) were related to cocaine use; of these, all occurred in men aged between 21 and 45, and most of the cocaine-related deaths were due to problems with the heart and its related systems.

Dr Joaquín Lucena, MD PhD, Head of the Forensic Pathology Service at the Institute of Legal Medicine (Seville, Spain) who led the study, said: "Our findings show that cocaine use causes adverse changes to the heart and arteries that then lead to sudden death."

Dr Lucena and his colleagues found that median levels of cocaine in blood or urine were 0.1 and 1.15 mg/L respectively, with a range that varied widely but which depended on a number of factors related to the drug itself (how it was taken, how people's bodies processed it and what other substances were taken at the same time), and to the people themselves (body mass index, acute or chronic use of the drug, other underlying health issues, age and sex). They wrote: "Any amount of the drug can be considered to have the potential for toxicity due to the fact that some patients have poor outcomes with relatively low blood concentrations, whereas others tolerate large quantities without consequences."

The researchers also found that 81% of the men who died after cocaine use also smoked, and 76% had drunk alcohol. Ethanol, the intoxicating ingredient in alcoholic drinks, enhances the "high" obtained from cocaine while minimising the subsequent "low". However, both smoking and alcohol are associated with heart disease and Dr Lucena said: "The combination of cocaine with either or both of these habits can be considered as a lethal cocktail that promotes the development of premature heart disease."

The study is the first to investigate the prevalence of cocaine-related sudden deaths in such a detailed and methodical way. The authors highlight the importance of this method of studying sudden deaths.

"For the correct diagnosis of the sudden death, especially in young adults, it is important to use a uniform autopsy protocol, including a toxicology investigation of the blood and urine for illicit drugs," said Dr Lucena. "Cocaine abuse is a growing public health issue in Europe and we can only monitor its prevalence by performing these detailed autopsies whenever someone dies suddenly."

In their study, the authors wrote: "The estimated number of COC

[cocaine] consumers is about 12 million Europeans with an overall prevalence of 3.7% of the total adult population (15-64 years). Ever in lifetime experience of COC is reported by more than 5% of the total adult European population in three countries: UK (7.7%), Spain (7.0%) and Italy (6.6%). The prevalence of use of COC is higher among young adults (15-34 years), with around 7.5 million young Europeans (5.4% on average) estimated as having used it at least once in their lifetime. In the year 2007, an estimated 3.5 million (2.4%) European young adults have used COC, with the highest prevalence levels, of over 3%, being found in Spain, Italy and the UK."

Dr Lucena said: "As the estimated number of European young adults cocaine consumers is similar in Spain, UK and Italy, there is no reason to consider that the cocaine-related sudden death in UK and Italy would be different to what we have found in our research in south-west Spain."

To put the rates of sudden deaths in context, he added: "According to our experience in the Forensic Pathology Service at the Institute of Legal Medicine, the rate of cocaine-related deaths per year in Seville, is roughly half the number of people who die suddenly from haemorrhagic stroke." [3]

Professor David Hillis and Professor Richard Lange, chairman and executive vice chairman respectively of the Department of Medicine at the University of Texas Health Science Center (San Antonio, USA), who were unconnected with the work, wrote an editorial to accompany Dr Lucena's paper. They reported that the prevalence of cocaine use varied in Europe from 0.7% in Romania and Lithuania to 12.7% in the UK, but this was likely to be an under-estimate.

They agreed that uniform protocols were required for post-mortems on victims of sudden death, including toxicological examination of the blood and urine for illicit drugs. "Until these are accomplished, the

prevalence of cocaine and other illicit drug use will be underestimated, and cocaine-related complications will not be recognized," they wrote. "Physicians should consider the possibility of cocaine abuse in a young individual with cardiovascular disease or sudden death, especially in those without traditional risk factors for atherosclerosis. Finally, the notion that recreational cocaine use is 'safe' should be dispelled, since even small amounts may have catastrophic consequences, including [sudden death](#)."

More information: [1] "Cocaine-related sudden death: a prospective investigation in south-west Spain." European Heart Journal. [doi:10.1093/eurheartj/ehp557](https://doi.org/10.1093/eurheartj/ehp557)

[doi:10.1093/eurheartj/ehp503](https://doi.org/10.1093/eurheartj/ehp503) cocaine abusers." European Heart Journal. [doi:10.1093/eurheartj/ehp503](https://doi.org/10.1093/eurheartj/ehp503)

[3] Haemorrhagic stroke is a type of stroke that accounts for about 15% of stroke cases. It results from a weakened vessel that ruptures and bleeds into the surrounding brain, accumulating and compressing the surrounding brain tissue.

Provided by European Society of Cardiology

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