Gamma hydroxybutyrate—a coma inducing recreational drug

John M Ryan, Ian Stell

Abstract
The effects of γ hydroxybutyrate, a coma inducing recreational drug, are described and illustrated by case reports of five patients presenting to accident and emergency (A&E). All had depressed levels of consciousness. There was strong circumstantial evidence of γ hydroxybutyrate ingestion in all cases, and laboratory evidence in two. All recovered with supportive treatment. γ Hydroxybutyrate has become a fashionable recreational drug. The majority of people who have ingested it will recover spontaneously without long term sequelae but its toxic effects may be dramatic while they last, particularly when it is taken with other drugs or alcohol.

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Keywords: γ hydroxybutyrate; seizure; recreational drug; hypothermia

We report five cases of coma arising from misuse of γ hydroxybutyrate, also known as sodium oxybate. This drug, commonly known as GHB, Liquid X, or Liquid Ecstasy, is a non-illegal drug which is used recreationally for its ability to produce euphoria. Toxic effects include drowsiness, headache, nausea, respiratory depression, seizures, and coma. These effects may be more pronounced when taken in conjunction with alcohol and other drugs. Patients usually recover after a few hours of supportive care.

γ Hydroxybutyrate was first reported as a drug of abuse in 1990 in North America and has been available in the United Kingdom, mostly in nightclubs and among body builders, since at least 1994. This drug and its toxic effects should be known to doctors responsible for patients who present unconscious or with seizures.

Case reports
All the patients presented to A&E having taken γ hydroxybutyrate in combination with various other drugs or alcohol.

Case 1
A 37 year old woman was brought to hospital after collapsing at home. A witness described a seizure, which was followed by deep uncon-

Figure 3 Cavity following debridement.
sciousness. Her condition improved over the following three hours and she was observed overnight. The following morning she admitted having taken γ hydroxybutyrate. Serum taken during the recovery period was later analysed by mass spectrometry and showed a γ hydroxybutyrate concentration of 42.5 mg/litre. (Concentrations greater than 30.5 mg/litre are associated with drowsiness.1) A blood sample taken eight hours later showed a concentration of 0.1 mg/litre and the urine concentration was 32.8 mg/litre. Traces of amphetamines, cannabis, and benzodiazepines were also detected in the urine.

CASE 2
A 23 year old man presented with a history of having taken half a bottle of γ hydroxybutyrate, three benzodiazepine tablets, and three pints of lager. He had been trying to climb a fence when he slumped over and had what witnesses thought was a brief fit. He subsequently remained unconscious. On arrival at the scene the ambulance crew reported a Glasgow coma score (GCS) of 3. This improved to 6 in the accident and emergency (A&E) department 90 minutes later and returned to normal after a further three hours. Shortly afterwards he took his own discharge.

CASE 3
A 30 year old man was brought to the A&E department having been found unconscious in the street. On arrival he had a GCS of 3, was hypothermic with a temperature of 32.8°C, hypotensive, and hypercapnic (Pco₂ 7.0). He rapidly improved and his GCS had returned to normal after three hours, when he discharged himself. He admitted having taken γ hydroxybutyrate, alcohol, and cocaine.

CASE 4
A 25 year old man collapsed at a table in a night club. On arrival in the A&E department he had a GCS of 4. He was hypothermic with a temperature of 34.2°C and was noted to be hypotonic. Ninety minutes later he had a brief convolution. Shortly afterwards he regained consciousness, vomited, and then rapidly improved. He was discharged three hours later. He admitted having had two bottles of beer, one Ecstasy tablet, and one and a half bottles of γ hydroxybutyrate. The serum concentration of γ hydroxybutyrate taken shortly after arrival was 2.2 g/litre. Serum MDEA, MDMA, and MDA (metabolites of Ecstasy) totalled 0.43 mg/litre. (After a recreational dose, levels may peak at 1 mg/litre.)

CASE 5
A 24 year old woman collapsed unconscious after taking one Ecstasy tablet, 30 minutes after taking a whole bottle of γ hydroxybutyrate. On arrival at the A&E department she was comatose, with a GCS of 4, a pulse rate of 48/min, and a temperature of 34.5°C. She was managed conservatively and awoke spontaneously after three hours. She recovered fully and was discharged after 10 hours.

Discussion
HISTORY
γ Hydroxybutyrate was first synthesised about 30 years ago during research into γ amino butyric acid (GABA). Since then it has been used as a general anaesthetic, a treatment for insomnia and narcolepsy, an aid to childbirth, and as a treatment for alcoholism.2,3 Many scientific papers have reported its low toxicity and lack of serious adverse effects when used for therapeutic purposes. This is in contrast to the dangers of the drug in abuse.4

During the 1980s its ability to stimulate growth hormone was recognised and it became widely used by body builders. In 1990 the Food and Drugs Administration in the USA banned over the counter sale of γ hydroxybutyrate following a number of reported incidents of acute poisoning, and several American states made its possession illegal.5

Since Spring 1994 it has been available in dance and night clubs around London where it has become known as “Liquid Ecstasy”. It is not a controlled drug in the United Kingdom, so possession is not an offence. However, unauthorised manufacture and distribution is an offence and there have been prosecutions under the Medicines Act.

γ Hydroxybutyrate is made relatively easily from common ingredients. The recipe is even available to people with access to the Internet. The sodium salt is produced as a powder or as a solution in water, and is often marketed in professional looking bottles which contrast sharply with the quality of manufacture (fig 1).

Figure 1 A typical appearance of a bottle of γ hydroxybutyrate.
Pneumococcal pericarditis presenting as an out of hospital cardiopulmonary arrest

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Abstract
Serious complications of pneumococcal pneumonia have become uncommon with effective antibiotic treatment. Purulent pericarditis is a rare though well described complication of untreated pneumococcal sepsis. A case of untreated pneumococcal pneumonia complicated by purulent pericarditis is described. This presented as an out of hospital asystolic cardiopulmonary arrest.

Keywords: Streptococcus pneumoniae; untreated pneumonia; purulent pericarditis; out of hospital cardiopulmonary arrest

Case report
A 29 year old man presented with an out of hospital asystolic cardiopulmonary arrest. Though previously well, he had suffered for two weeks with a “flu-like” illness. Musculoskeletal chest pain had been diagnosed four days before presentation, when he developed pleuritic symptoms. He had complained of
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