



### K14 Identification of GHB and Morphine in Hair in a Case of Drug Facilitated Sexual Assault

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After attending this presentation, attendees will appreciate the importance of an accurate toxicological analysis in sexual assault cases.

This presentation will impact the forensic science community by detailing a unique circumstance of sexual assault and the drug GHB Gamma-hydroxybutyric acid, a substance naturally present in mammalian species, which has been utilized to commit the crime.

Gamma-hydroxybutyric acid GHB is qualified as a “predatory drug.” Doses of 10 mg/kg cause amnesia, 20-30 mg/kg induce sleep and doses of 50 mg/kg or higher produce anesthesia. It is attractive for rapists because it can be found easily (on the street, fitness centers, and internet) and moreover because it can be delivered mainly as an odorless, colorless liquid and so it is often assumed unwittingly, mixed in spiked drinks.

**Case Report:** The case of a 24-year-old girl who was sexually assaulted after administration of Gamma-hydroxybutyric acid (GHB) and morphine will be presented. She had been living in an international college for foreign students for about one year and often complained of a general unhealthy feeling in the morning. At the end of the college period she returned to Italy and received at home some video clips shot by a mobile phone camera. In these videos she was having sex with a boy she met when she was studying abroad.

**Materials and Methods:** Toxicological analysis of the victim’s hair was done: the hair was 20 cm long. A 2 cm segmentation of all the length of the hair was performed. Morphine and GHB were detected in hair segments related to the period of time she was abroad. The analyses of hair segments were performed by gas chromatography/mass spectrometry (GC/MS) and the concentration of morphine and GHB were calculated.

**Conclusions:** A higher value of GHB was revealed in the period of the criminal event and the presence of morphine was also detected for the same period. According to previous observations our case shows that hair analysis is the only method used to prove repetitive exposure to a toxic substance. This case demonstrates also that a high concentration of GHB in hair reflects an acute overexposure to GHB and can be documented several months after the sexual assault. In general it must be specified that the possibility given by hair analysis should not prevent the victim and the medical examiner from taking urine, blood, and sweat samples as soon as possible after the event. Hair analysis may be a useful adjunct to conventional drug testing in sexual assaults and it should not be considered an alternative to urine analysis, but a complement. It is possible that hair analysis could be a useful addition to conventional drug testing in sexual assault, but it is believed that further studies may confirm the usefulness of this technique and establish the definition of legally defensible cut-off values.

#### **GHB, Hair Analysis- GC/MS, Drug Facilitated Sexual Assault**