Gamma Hydroxybutyrate (GHB) - General Effects

Gamma Hydroxybutyrate (GHB, Xyrem) is a sedative hypnotic and a central nervous system (CNS) depressant.

1. GHB is an illicit recreational drug of abuse and it may be used in drug facilitated crimes (DFC) which include drug facilitated sexual assaults (DFSA). GHB has been employed clinically as an anesthetic and hypnotic agent, but in the United States it is currently limited to investigational use only. The sodium salt is marketed illicitly for weight control and sedation.
    a. GHB has a half-life of 0.3-1 hour.
    b. The following blood concentrations have been generally associated with the corresponding effects:
        i. 260 mg/L: Deep sleep
        ii. 156-260 mg/L: Moderate sleep
        iii. 52-156 mg/L: Light sleep
        iv. <52 mg/L: Wakefulness
    c. Trace amounts of GHB are produced endogenously as a precursor and metabolite of the major inhibitory neurotransmitter, gamma-aminobutyric acid (GABA). The endogenous concentrations of GHB are higher in urine than blood for antemortem samples.
        i. In antemortem urine samples, a GHB concentration greater than 10 mg/L generally indicates exogenous exposure.
        ii. In antemortem blood samples, a GHB concentration greater than 5 mg/L generally indicates exogenous exposure.
    d. The onset of GHB's effects on performance and behavior occurs by 15 minutes after ingestion and lasts for up to 3 hours.
2. General effects of GHB include, but are not limited to drowsiness, nausea, euphoria, dizziness, visual disturbances, amnesia, unconsciousness, relaxation, horizontal and vertical gaze nystagmus, slurred speech, miosis, hypothermia, headache, inoordination, and confusion.
3. The longer an individual uses a drug, the more they can build up a tolerance to its effects. Tolerance occurs when an individual no longer responds to the drug in the way that they initially responded. When an individual gains tolerance to a drug, a higher dose of the drug is necessary to achieve the same level or response initially achieved. As tolerance is gained, it may reduce some of the possible negative effects of a drug.
4. Drug metabolism (alcohol excluded) exhibits first order kinetics, or the elimination of a constant fraction of drug quantity per unit of time, which means that the amount eliminated is proportional to the drug concentration.
5. The use of more than one drug at a time may enhance the effects the drugs would otherwise have on their own, leading to greater impairment.

References

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Template and general factual statements used from Colorado Bureau of Investigation's monograph system. Edits and fact checking performed by Wisconsin State Crime Laboratory prior to publication.

** The interpretive information provided is not exhaustive nor meant to encompass all scenarios where toxicological results are reported. Interpretive information is meant to serve as a general guide for the reader and that for any given case, consultation with a forensic toxicologist is recommended. **