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Forensic Identification of Sexual Assault by use of Date Rape Drugs

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Abstract

Date Rape Drugs are quite common and increasing in developed as well as developing countries. Drug-facilitated crime (DFC) is a general term that includes rape or other sexual assault, robbery, money extortion, as well as the deliberate maltreatment of the elderly or children under the influence of psychotropic substances These are drugs that are sometimes used to assist a sexual assault. Sexual assault is any type of sexual activity that a person does not agree to. It can include touching that is not okay; putting something into the vagina; sexual intercourse; rape; and attempted rape. Victims may be unconscious during all or parts of the sexual assault and, upon regaining consciousness, may experience anterograde amnesiathe inability torecall events that occurred while under the influence of the drug. The central nervous system depressant substances that have been most frequently associated with drug facilitated sexual assault in the international literature are alcohol, benzodiazepines, gamma-hydroxy butyrate (and related substances), and ketamine.

Keywords: Drugs, Sexual Assault, Rape.

Introduction

In recent years the media has widely publicized incidences of sexual assault where the perpetrators have used drugs to debilitate the persons they assault. While this is not a new phenomenon, drug-facilitated sexual assault has only recently become widely recognized [1].DFCs are criminal acts carried out by means of administering a substance to a person with the intention of impairing behaviour, perceptions or decision-making capacity. It also extends to taking advantage of an impaired person, without their consent, after their voluntary intake of an incapacitating substance. While the covert use of drugs to facilitate crime has occurred over the centuries, it has recently been highlighted by a significant increase in reports of DFC worldwide. Psychoactive substances used in DFCs may alter the victim's degree of consciousness, state of awareness, judgement and memory. Such substances can make the victim vulnerable and unable to fight off their attacker. In addition, they can be used to sedate the victim in order to facilitate easier transport by the perpetrator [2]. Yet the most common and prevalent date rape drug, alcohol, is still not readily recognized as a tool used by perpetrators [3,4]. In fact, almost half of the sexual assaults that young adults experience take place under the influence of alcohol. The use of date rape drugs clearly illustrates how sexual assaults are planned and premeditated events.

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Perpetrators of sexual assault use date rape drugs as a method to incapacitate their victim and to ensure that she/ he will not be able to resist the assault. In addition, using date rape drugs ensures that the survivor will not recall enough details about the assault to prosecute the perpetrator [1]. Commonly called "drink spiking," the typical scenario suggested to epitomize DFSA is one in which a hypnotic, sedative, or anxiolytic drug is surreptitiously administered to a beverage, enabling the perpetrator to commit their crime. Anumber of substances have these characteristics and have gained a reputation for being associated with DFSA, most notably flunitrazepam (Rohypnol), and, to a lesser degree, gamma hydroxybutyrate (GHB) and ketamine, two drugs used to varying degrees within the international recreational arena [5,6].Some aspects of these drugs like pharmacology, desired and undesired effects which are used to commit crime and their forensic aspects of analysis are discussed in this review [7,8,9].

Different Type of Date Rape Drugs

Drugs often referred to as date-rape drugs are GHB, also known as gamma-hydroxybutyric acid, and benzodiazepines (such as flunitrazepam, also known as Rohypnol or "roofies"); a vetenarian anaesthesia like ketamine however, an American 1997 study showed that alcohol is still used. Alcohol remains the most commonly used date rape drug because it is legal and readily available. Many assailants use alcohol because their victims often willingly imbibe it, and can be encouraged to drink enough to lose inhibitions or consciousness. Even if the victim agrees to sex, the act may be

considered rape in some jurisdictions if the victim's judgment was impaired or incapacitated by alcohol assailants have committed "rapes of convenience" whereby they have assaulted a victim after he or she had become unconscious from drinking too much [10,11,12].

Benzodiazepines

Benzodiazepines are drugs used to treat anxiety, panic attacks, insomnia, and several otherconditions. Some benzodiazepines used to treatinsomnia possess powerful sedative, motorimpairing, and strong amnestic properties. Flunitrazepam (Rohypnol), temazepam (Restoril), and midazolam are the three benzodiazepines most commonly used to facilitate date rape; all three are hypnotic benzodiazepines [13]. One of these neurotransmitters is gamma-aminobutyric acid (GABA), a neurotransmitter that suppresses the activity of nerves. Scientists believe that excessive activity of nerves may be the cause of anxiety and other psychological disorders, and benzodiazepines reduce the activity of nerves in the brain and spinal cord by enhancing the effects of GABA [14].In recent news, it has been discovered that scientists can now detect flunitrazepam and related compounds in urine at least up to five days or in hair up to a month after administration of a single dose of Rohypnol [15,16]. Benzodiazepines have also been used as a "date rape" drug because they can markedly impair and even abolish functions that normally allow a person to resist or even want to resist sexual aggression or assault. In recent years, the detection and conviction of people involved in this has increased dramatically. The drug is usually added to alcohol-containing drinks or even soft drinks in powder or liquid forms and can be hard to taste. High doses of benzodiazepines can produce more serious side effects. Signs and symptoms of acute toxicity or overdose may include the following: Drowsiness, Confusion, Dizziness, Blurred vision, Lack of coordination, Difficulty breathing [17].

Ketamine

Ketamine (KT) is widely abused for hallucination and also misused as a date rape drug in recent years. Ketamine was derived from phencyclidine (PCP) in 1960s for use as dissociative anesthetic. It cause anesthesia without respiratory depression by inhibition of neuronal uptake of norepinephrine, dopamine, serotonin, and glutamate activation in the N-ethyl D-aspartate receptor channel. This drug can cause bizarre ideations and hallucinations-side effect that limited its medical use but appeals to recreation drug users. As pharmaceutical ketamine is distributed in liquid form that can be ingested or injected [1]. It's a powerful general anaesthetic which stops you feeling pain and it's used for operations on humans and animals. The effects don't last long, but until they wear off, ketamine can cause a loss of feeling in the body and paralysis of the muscles. It can also lead to you experiencing a distortion of reality [18]. It is available in powder as well as liquid form and is colourless as well as tasteless. Because of these properties it is used for drugging people in parties and hence is notoriously known as date rape drug [19]. Effects of ketamine ingestion appears rapidly and lasts about 30-45 minutes with sensation of floating outside the body, visual hallucination and a dream like state along with these desired effects, users also commonly experiences confusion, antirograde amnesia and deliriu [20]. They also may experience tachycardia, palpitation, hypertension and respiratory depression with apnea. Flash back or visual disturbance can be experienced days or week after ingestion. Some chronic users become addicted and exhibits severe withdrawal symptoms that require detoxification. Ketamine is commonly used as club drug and also as mixture with alcohol before committing sexual assault, robberies with the victims [21].

Alcohol

Alcohol is a common depressant that slows the activity of the central nervous system (CNS). It lowers inhibitions, disturbs motor skills, and a large intake of alcohol can even result in a temporary coma; its effects subside fairly slowly, as it takes the human body one hour to process each alcoholic drink consumed. Alcohol is by far the most prevalent date rape drug and is easy to use because it is legal and socially accepted. In some cases, perpetrators take advantage of the fact that an individual is drinking heavily. In other cases, the perpetrator is actively involved in ensuring that an individual gets drunk by buying drinks, encouraging her/him to drink, and pouring drinks with more alcohol than usual. either case, when an individual is drunk she/ he is legally unable to consent to sexual activity. There is a misconception among some people that accepting drinks from someone indicates interest in sexual activity. Yet, consenting to having a drink is not consenting to sexual activity it is solely consenting to having a drink. Recently is has been reported that the drugs like GHB, Benzodiazepines and ketamine or any one of them is mixed in the alcoholic drinks before committing the sexual assault [22].

Gamma-Hydroxybutyric Acid

Gamma-Hydroxybutyric acid (GHB) and 4-hydroxybutanoic acid are naturally-occurring substance found in the *central nervous system*, wine, beef, small citrus fruits, and almost all animals in small amounts [3]. It is also a *neuroprotective therapeutic nutrient* that is categorized as an *illegal drug* in many countries. It is used to treat catalepsy and excessive daytime sleepiness in patients with *narcolepsy.* Synthesis of the chemical GHB was first reported in 1874 by *Alexander Zaytsev*, but the first major research into its use in humans was conducted in the early 1960s by Dr. *Henri Laborit* to use in studying the neurotransmitter *GABA.* It quickly found a wide range of uses due to its minimal side-effects and short duration of action, the only difficulties being the narrow therapeutic dosage range, despite an unusually high *LD50* and the dangers presented by its combination

with *alcohol* and other *central nervous system* depressants. Historically, GHB has been used in a medical setting as a general anesthetic, to treat conditions such as insomnia, clinical depression, narcolepsy, and *alcoholism*, and to improve athletic performance [23, 24]. It is also used *illegally* either as an intoxicant or as a *date rape drug.* GHB is naturally produced in the human body's cells and is structurally related to the ketone body âhydroxybutyrate. As a supplement/drug, it is used most commonly in the form of a salt. GHB is also produced as a result of fermentation, and so is found in small quantities in some beers and wines. Succinic semialdehyde dehydrogenase deficiency is a disease which causes GHB to accumulate in the blood, producing similar effects to GHB [25, 26, 27]. GHB was widely used in France, Italy, and other European countries for several decades as a sleeping agent and an anesthetic in childbirth, but problems with its abuse potential and development of newer drugs have led to a decrease in legitimate medical use of GHB inrecent times. The only common medical applications for GHB today are in the treatment of narcolepsy and more rarely alcoholism. GHB has at least two distinct binding sites in the central nervous system. GHB is an agonist at the newlycharacterized GHB receptor, which is excitatory, and it is a weak agonist at the GABAB receptor, which is inhibitory [28].

Lysergic Acid Diethylamide (LSD)

LSD (lysergic acid diethylamide), first synthesized in 1938, is an extremely potent hallucinogen. It is manufactured from lysergic acid, which is found in ergot, a fungus that grows on rye and other grains.LSD is produced in crystalline form and then mixed with excipients, or diluted as a liquid for production in ingestible forms. It is odorless, colorless and has a slightly bitter taste. LSD is sold in tablet form (usually small tablets known as Microdots), on Sugar Cubes, in thin squares of gelatin (commonly referred to as Window Panes), and most commonly, as blotter paper (sheets of absorbent paper soaked in or impregnated with LSD, covered with colorful designs or artwork, and perforated into one-quarter inch square, individual dosage units). Under the influence of LSD, the ability to make sensible judgments and see common dangers is impaired, making the user susceptible to personal injury, which can be fatal. After an LSD trip, the user may suffer acute anxiety or depression, and may also experience flashbacks, which are recurrences of the effects of LSD days or even months after taking the last dose. A flashback occurs suddenly, often without warning, usually in people who use hallucinogens chronically or have an underlying personality problem. Healthy people who use LSD occasionally may also have flashbacks. Bad trips and flashbacks are only part of the risks of LSD use. LSD users may also manifest relatively long-lasting psychoses, such as schizophrenia or severe depression.LSD produces tolerance, so some users who take the drug repeatedly must take progressively higher doses to achieve the state of intoxication that they had previously achieved. This is an extremely dangerous practice, given the unpredictability of the drug [29].

Other Drugs

Chloral hydrate produces a sedative/hypnotic effect similar to that of benzodiazepines. A drink that has been spiked with chloral hydrate is often called a Mickey Finn and is frequently used in crime including sexual crime [1].

Woman protect herself from Date Rape Drugs

Whether you are at a bar, restaurant or in any public setting, keep yourself and friends safe by doing these simple things.

- Never leave your drink unattended.
- Do not accept open-container drinks from anyone but a bartender or server. If you are accepting a drink make sure it is from an unopened container that you open the container yourself.
- Be wary about accepting drinks from anyone you do not know well or long enough to trust.
- Attend parties or visit bars with a group of friends, arranging beforehand to watch each other's drinks
- If you arrive as a group, leave as a group.
- Watch out for your friends. If a friend shows symptoms of date-rape drug ingestion, seek medical attention immediately.
- Notify other females you know about the effects of these dangerous drugs.
  If you think you have been a victim, notify the authorities immediately [30].

Biological Specimens for Date-Rape Drug Analysis

Urine is the most useful specimen in the majority of date drug investigations. Because drugs and metabolites are concentrated in urine, they tend to be more readily detectable in this specimen. Urine sample should be collected as soon as possible after the crime, not to exceed 96 hours after the suspected drug exposure. If possible, 100 mL of urine should be collected to ensure that enough of the specimen is available for the laboratory to perform a sensitive, thorough analysis while also retaining a suitable portion for retesting [31]. These specimens should be refrigerated or frozen until analysis. Recent reports suggest that the addition of sodium fluoride to these samples may also be beneficial, particularly when there will be an extensive delay between collection and analysis [32, 33]. In blood specimens, the detection limits most drugs used to facilitate crimes fall below the typical laboratory detection limits within 24 hours after ingestion, therefore restrict the usefulness of this specimen. In cases in which blood can be collected a short time after drug ingestion, the combination of blood and urine specimens may provide a clearer picture as to the window of exposure to the drug. Blood specimens should be placed into collection tubes containing sodium fluoride. At least 7 to 10 mL of blood should be collected when it can be

provided within 24 hours of the suspected drug exposure [31]. It is important to note that blood samples should be accompanied by a urine specimen. Often, a victim of a DFSA does not present to medical or law enforcement people until weeks or even months after the alleged crime. At this point, it is no longer possible to find evidence of a drug in blood or urine specimens. In these cases, samples of hair have shown great promise, particularly when newer analytical instrumentation with superior sensitivity is used [34,35,36]. Hair samples pose more complication in interpretation compared to blood and urine specimen due to the lake of information about its association of DFAS drugs with it. It requires skilled person to interpret the results of the segmental analysis. It has also been reported that the human biological fluids cerebrospinal fluid (CSF) and saliva were employed as specimens for date-rape drug analysis [37].

Discussion

Drugs used in sexual assaults typically are distributed at raves, dance clubs, and bars, but they are increasingly being sold in schools, on college campuses, and at private parties. Some of these drugs also are purchased via the Internet while others, particularly prescription benzodiazepines, are often found in homes. Law enforcement reporting indicates that these drugs are widely available in most urban areas and are becoming increasingly available insuburban and rural communities. Sexual assault victims who believe drugs were surreptitiously given to them typically report remembering sensations of drunkenness that do not correspond with the amounts of alcohol consumed, unexplained gaps in memory, altered levels of consciousness, and unexplainable signs of physical trauma. The incidence of drug facilitated sexual assault is unclear. Many victims fail to report the incident for reasons discussed above. Where victims do report the incident, the elapsed time may be too long for drugs to be reliably detected in blood or urine.

Conclusion

The use of date rape drugs is increasing in developed as well as developing countries. Much of the information about date rape drugs emphasizes ways in which women can stay safe from these drugs. Examples include only accepting drinks from people you know, especially at a bar, keeping an eye on your drink at all times, and not drinking from wide mouthed containers. These statements are misleading for several reasons. Firstly, date rape drugs can be used in many locations, not just in bars. The Sexual Assault Centre has seen cases where date rape drugs were used at house parties, restaurants, and while camping. Also, it is more common for a friend, partner, or acquaintance than a stranger to use the drugs on someone. In addition, these statements are almost always directed at women, but men can also experience drug-facilitated sexual assault [1].Victims of these crimes do not sense any threat to their safety when the assailant is incapacitating them. The "weapon" used to overpower and disable them is invisible. It is hidden in a drink. The ability to sense danger is critical to a person's ability to implement self-defence strategies. When faced with the threat of being raped, most people employ one or more protective measures, such as verbally negotiating with the assailant, cognitively assessing their options, screaming, stalling, attempting to escape, and/or physically resisting. If these efforts fail to prevent the rape, victims may "fight back" in other ways. They may use their sensory and cognitive abilities to memorize details about the assailant's physical characteristics, the location of the crime, and other factors that can later be used to aid authorities in apprehending and prosecuting the offender.

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