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Drug Facilitated Penetrative and Non-Penetrative Sexual Assault: A Review

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Abstract

Drug facilitated sexual assault (DFSA) is an offense in which victims are subject to unwanted sexual activity while they are under the influence of drugs or alcohol and are therefore not able to resist the assault, or we can say a sexual activity in which consent is invalid or absent because the victim is under the influence of drugs or alcohol. Some common date rape drugs are Rohypnol, GHB, and Ketamine, but it is observed that alcohol was more prevalent in cases of drug-facilitated sexual assault in contrast to other date rape drugs. The major problem in DFSA cases is underreporting of the incidence due to amnesia. The victim has difficulty recalling what happened, and sometimes they are reluctant to report due to voluntary drug use or family pressure, or fear of society. Most of the instance's cases are written later, which hinders the analysis, especially when rapidly metabolizing drugs are used. In case of the absence of injuries, the chances of misdiagnosis increase. There is a need to create a safe space where victims can reach and open up about their problems to get much-needed emotional and mental support. This paper reviews how prevalent are drug-facilitated sexual assault cases throughout the world, how to treat the post-assault symptoms, and what all new techniques have been researched to detect drugs.

Keywords: DFSA; PTSD; Drugs; Alcohol

Abbreviations: DFSA: Drug Facilitated Sexual Assault; GC-MS: Gas Chromatography-Mass Spectrometry; LC-MS: Liquid Chromatography Coupled To Mass Spectrometry; CT: Cognitive Therapy; BCG: Bromocresol Green; ROI: Region of Interest; UNODC: United Nations Office on Drugs and Crime; WHO: World Health Organization; EMCDDA: European Monitoring Centre for Drugs and Drug Addiction; GHB: Gamma-Hydroxybutyrate; IMS: Ion Mobility Spectrometry.

Introduction

The sexual assaults are tremendously rising and are a big blot in the name of women's safety. A preparator performs these assaults intending to attain sexual gratification. Nowadays, preparators go to any extent for their purpose, either performing forcefully or under the influence of the drug. Before going onto drug-facilitated sexual assault, we need to understand what exactly is a sexual assault. Sexual assault is any sexual activity (vaginally, anally, or orally) without voluntary consent by the victim. It comprises both penetrative and non-penetrative activities. As per the studies, it is estimated that one in every six women is a victim of sexual assault once in her lifetime [1-3]. Sexual offenses are heinous crimes against a person's body, resulting in physical trauma and mental anguish [4]. Drug facilitated sexual assault (DFSA) is an offense in which victims are subjected to unwanted sexual activity while they are under the influence of drugs or alcohol and are therefore not able to resist the

assault, or we can say a sexual activity in which consent is invalid or absent because the victim is under the influence of drugs or alcohol. Talking in layman's terms, DFSA is using a chemical substance or alcohol to make sexual assault easier without the victim's consent as they are under the influence of the chemical substance or alcohol. Hence, the preparator tries to obtain sexual gratification by this method [5]. Drug facilitated sexual assault is also known as "date rape" or "drug rape." These assaults are carried out in two different situations by the preparator, i.e., opportunistic and proactive. In opportunistic DFSA, the victim voluntarily takes the drug, and an alleged assailant takes benefit of this. In the proactive DFSA, the assailant forces the victim to administrate the drug [6]. Any drug that increases the possibility of sexual assault by lowering sexual inhibition can be considered as a date rape drug. Though it is an, tough to distinguish the ideal drug from rape drugs, as these date rape drugs are odorless, colorless, and tasteless. The rape drugs act rapidly, causing the victim to lose consciousness and induce amnesia [1,5,7]. The list of drugs being used for DFSA is extensive as new drugs become available and the list grows. The most commonly used drugs (alone or in combination) for DFSA are benzodiazepines, antihistamines, antidepressants, marijuana, cocaine, gamma-hydroxybutyrate (GHB), and alcohol. It is not uncommon to find more than one drug for carrying out sexual assault because it makes the victim more vulnerable [5,6]. One of the major problems with sexual assault cases is that most of the victims don't report about it due to the fear of society, how people will judge them because, in India, a female is usually blamed when sexual assault occurs. Sometimes her family doesn't support her decision of reporting about it. Sometimes they report it later, which creates a problem with collecting shreds of evidence and its proper evaluation. Most of the time, if a woman is drunk, she is blamed when any sexual assault occurs for putting herself in that situation; very rarely is the perpetrator blamed for taking advantage of the situation [1]. While dealing with a sexual assault case, some other problems are that the patient is not treated as a victim and the health care personnel have no idea how to document or collect the available toxicological or biological evidence for a forensic analysis without contaminating it [2]. Sometimes physicians do not think about the possibility of DFSA while treating a patient with injuries. They may treat the patient for immediate injuries and do not ask about the possibility of sexual assault. If they know it is a case of sexual assault, they may collect biological evidence related to the crime. They may not collect evidence for toxicological analysis. Or, sometimes, they may mistakenly think of it as a case of self-induced substance abuse [2]. A drug used for carrying out sexual assault is very potent. Because of this, they are administered in small doses, which cause a problem in their detection as they will be present in less concentration in biological samples. In DFSA, if a victim reports a crime after some time has been elapsed, it also creates many problems because some drugs metabolize quickly and are eliminated from the body without leaving a trace [8]. Various biological samples can be used to detect drug use, such as blood, hair, urine, etc. we consider blood to be the gold standard sample for the detection of drug use [8]. A rape kit is available in the laboratories to test for the abuser's DNA in a sexual assault case [2]. The type of sample collected after drug-facilitated sexual assault depends on when the victim is reporting about it, i.e., the time elapsed since the incident took place. If the time elapsed is less, then the sample collected for toxicological analysis will be urine and blood (and in some jurisdictions, it will be saliva also). But if a victim is reporting after a long time, then the sample collected for toxicological analysis will be hair. The number of drugs found in the hair will be less (in pg./mg to ng/mg); that is why susceptible methods for detection are required [2,6].

The techniques that are commonly used in the detection of date rape drugs include gas chromatography-mass spectrometry (GC-MS), gas chromatography-tandem mass spectrometry (GC-MS/MS), liquid chromatography coupled to mass spectrometry (LC-MS), and liquid chromatography-tandem mass spectrometry (LC-MS/MS) [8,2].

Review of Literature

Gauntlett-Gilbert, et al. [9] stated that the psychological consequences of a DFSA victim are different from that of a sexual assault victim due to the drug-induced amnesia, which can be partial or total. They usually do not get the social support they need. Russell & Curran [10] conducted a study on 29 female survivors of DFSA who were recruited by Victim Support, Rape Crisis, and the Date Rape Trust. They found out that on the posttraumatic stress diagnostic scale, 26 out of the 29 females reported "moderate" to "severe" PTSD symptoms [11]. During their study, they also noticed that in the DFSA individual's emotional response to trauma is blunt, which is due to partial or total amnesia. It is believed that victims can experience PTSD even if they have no memory of what happened [12]. Victims surviving from PTSD will experience intrusions of memory that they remember or sometimes surge in emotions when they encounter certain cues which are not associated with a specific memory. For example, when a victim comes in contact with a particular smell or fragrance, they experience distress [13]. PTSD can be treated by exposure to traumatic memory and cognitive restriction, but it is ineffective if there is no memory of assault [11]. Three treatment strategies were proposed by Ehlers & Clark [14], which are exposure to traumatic memories, changing negative appraisals, and dropping maladaptive coping strategies. Disclosure may be carried out to traumatic memory fragments or intrusions of secondary stimuli, and such pieces or sensory impressions may constitute a survivor's emotional "hotspots" [15]. It is the

center of the exposure treatment. Moreover, Hurley, et al. [16] determined the incidences of unexpected toxicology and to identify the profile of drugs in cases of alleged sexual assault. In this study, both penetrative, as well as non-penetrative cases were considered. Out of 434 cases of adult sexual assault, 76 cases were of suspected DFSA in 12 months when the study was conducted. In these 76 cases, 95% of subjects were females, and their average age was found to be 25.6 years. In 59% of cases, the clarity with which subject can recall the events was "unclear or patchy," in 24% cases, there was "no recollection," in 15% cases it was "clear," and no data was found for 4% of cases. In 20% of the cases, i.e., 15 out of 76 cases, toxicological evidence of possible covert drug administration was found. These findings indicated that there is a need for public education. The following things should be kept in mind- not accepting a drink from strangers, protecting your drinks, and not accepting opened cans. However, Beynon, et al. [17] systematically review already existing research that quantifies the contribution of drugs in cases of alleged DFSA. A considerable amount of evidence for the occurrence of DFSA is based on individual cases, media reports, or research reports with identifiable shortcomings. The key terms used for the search were: drug* with rape and sexual assault and drink spiked. The titles, abstracts, and text of peer-reviewed scientific literature, in addition to reports, chapters of books, legal documents (PubMed, Medline, Blackwell-Synergy, Oxford Journals, Psych Info, BIDS Ingenta) were interrogated for references to DFSA. Firstly, the authors of this article identified samples that contained substances able to cause incapacitation (those able to cause sedation). After that, the authors removed those samples in which drugs were voluntarily consumed for intoxication or medicinal purposes. All other studies identified in this review failed to exclude voluntary drug consumption from their analyses, and the results were biased. There were 11 studies in which covert administration was discussed in cases of DFSA, but 10 of them consisted of voluntary consumption of drugs and alcohol. Only 1 article [18] identified by our systematic search considered DFSA in terms of voluntary and covert drug administration, and the authors reported that covert drugging accounted for only 2% of instances of alleged DFSA. Furthermore, Marc [19] stated that the reason for misdiagnosis in DFSA is the absence of injuries in most cases as the victim cannot defend themselves under the influence of drugs which makes sexual assault easier for the assailant. According to the U.S. Department of Justice data, 44% of cases of sexual assault happened under the influence of drugs and alcohol. There are various types of consequences of DFSA: physical, infectious, psychological, genital, and anal. Physical consequences of DFSA include physical violence, which is usually seen in cases involving more than one assailant. It is also seen in cases in which assailants mimic pornographic behavior, homophobic male sexual assault, and sadistic female sexual assault. For an appropriate sexual abuse assessment, it is important to document the findings of a full physical examination. Before conducting a clinical examination, the condition of the victim's clothes should be noticed. Violent handling of the victim can be deduced by the presence of ecchymosis and hematomas on the internal parts of the thighs, arms, or knees, which will indicate forced vaginal penetration. If, after drug administration, a victim is dragged along the ground to reach a bed, in those cases, bruises can be observed. The infectious consequence of DFSA includes the risk of transmission of sexually transmitted disease, which is very high in DFSA. In such cases, along with providing prophylaxis for STDs, the physician must also exceed the possibility of unwanted pregnancy in the female victims. The psychological consequences of DFSA can be divided into short-term effects and long-term effects. Short-term effects include having nightmares, sleep disturbance, and impairment in social functioning. In contrast, long-term effects include suffering from depression, anxiety, loss of self-image, alcohol addiction, social and sexual dysfunction. Genital and anal consequences of DFSA include finding evidence that will link to vaginal or anal penetration. The most common form of sexual assault in females is vaginal penetration, followed by oral sex and anal sex. In contrast, in males, the most common type is anal penetration followed by oral sex. Vaginal lesions are mostly seen in the cases of sexual assault if vaginal penetration occurred. For anal examination, the victim should be in a knee-chest or prone position. The commonly seen shreds of evidence in anal sex are abrasions, hematomas, and lacerations of the anus. Whereas Olszewski [20] mentions the ideas around measures that need to be taken to stop DFSA. Over the last decade, there has been an increase in drug-facilitated sexual assault (DFSA); out of other substances, alcohol has been more commonly using to take advantage of the victim by creating a lack of decision-making ability due to excess consumption of alcohol. The majority of females are aware of alcohol use to make an individual intoxicated to take sexual advantages without consent. Still, the problem arises on monitoring this particular instance as the victim is consuming the substance as per their own will. This particular has led to the foundation of 'date rape drugs' and 'drink spiking.' There have been a lot of surveys about this particular issue. If we look at the data from concerned authorities for DFSA, it has been found that DFSA has a large number of female victims as compared to males, and based on some of the surveys, a lot of women has confessed that alcohol has been used as the substance to get them intoxicated and take sexual advantage without consent. There is an immediate need for awareness among people and the government's support in creating more ways of reaching the proper authorities and supporting such victims. There has been a significant change in laws and policies of tolerance from many governments across the globe; however, there is still a need to bring change and awareness. Some tremendous changes have been made, such as gender-neutral

offenses, rape in marriage, availability of such drugs, changes made to low to lower the cases of DFSA, etc. In conclusion to the changes brought by the various campaigns, government agencies, etc., there is an urgent need for help from authorities in creating a safe and supporting way for victims to report such instances and have a proper monitoring system in place. In contrast, Du Mont, et al. [21] determined the prevalence of and factors associated with suspected drug-facilitated sexual assault. In the year 2004, 7 out of 34 hospital-based treatment centers for sexual assault and domestic violence in Ontario were recruited to carry out the study. Delphi method was used for the study to generate key criteria for suspected drug-facilitated sexual assault. Researchers created a screening form to gather information about the participants, which included a list of valid reasons that would support a person's belief that they had been sexually assaulted and the list of symptoms associated with a suspicion of having been drugged. The result showed a total of 882 victims were eligible for inclusion in the study, and out of 882, 855 (96.9%) were women, and 184 (20.9%) met the criteria for suspected drug-facilitated sexual assault, which shows that suspected drug-facilitated sexual assault is a common problem. Therefore, sexual assault services should be tailored to meet the needs of those experiencing this type of victimization. Providing access to hospital-based toxicologic screening services with the sensitivity to detect "date rape drugs" would help meet the needs of victims of drug-facilitated sexual assault. At the same time, given that suspected drug-facilitated sexual assault is associated with victims' voluntary substance use, we must increase awareness of the effects of using alcohol, particularly in combination with prescription, over-the-counter, and street drugs, through public awareness campaigns, including posting information at clubs, pubs, bars, university, and college campuses. Furthermore, Padmanabhanunni & Edwards [22] showed how can we treat PTSD caused after DFSA by using Ehlers and Clarks' (2000) cognitive therapy (C.T.) via details obtained from [9] work and mentions three noticeable case studies conducted in South Africa which support treatment of PTSD following proactive DFSA to improve and improvise on [9] work. The case study involved three women who have suffered from PTSD and used C.T. for the treatment. This process turned out to be effective; this method was used as cognitive therapy to help all three of them recover from PTSD and depression caused due to DFSA. The implementation of this experiment was based on important factors like Evidence-based therapeutic intervention for patients to help them in bringing change, increasing their motivation for bringing change by making them understand that they have social support, some victims didn't have any idea about DFSA, so educating them about it made them realize they were drugged. Hence, they were able to forgive themselves as earlier they use to blame themselves for not having control after alcohol consumption, helping them by making them feel safe, making them realize they have authority, revisiting a memory, and helping victims in recalling facts and it's not "all in your head"; rather, our bodies hold data as well so helping them through therapy. These case studies added to the findings of Gauntlett-Gilbert, et al. [9]. Additionally, Demoranville & Verkouteren [23] suggest that ion mobility spectrometry (IMS) instruments can be used in field settings for rapid screening of DFSA agents in a non-invasive manner can aid in initial treatment and investigation in cases of sexual assault. IMS is widely used for screening purposes for the detection of explosives by the U.S. Transportation Security Administration and screening of illicit drugs by customs and prisons and border control agencies. It has many advantages, like requiring less sample preparation, inexpensive screening tool, rapid detection, being engineered to be successfully utilized by a non-expert, and having high sensitivity for many compounds. By this experiment, a conclusion is drawn that if we get more information regarding the concentrations of DFSA agents in their metabolites in sweat, IMS have the sensitivity and resolution that is needed to make a qualitative, presumptive identification for flunitrazepam, ketamine, norketamine, dehydronorketamine, MDMA, MDA and 7-Aminoflunitrazepam. Also, Gautam, et al. [24] reconstructed the spiking of drinks with three benzodiazepines which were diazepam (frequently encountered benzodiazepine in DFSA case) flunitrazepam (considered as a date rape drug), and temazepam (a metabolite of diazepam). They chose five drinks (Bacardi, Breezer, becks beer, Hardy's Chardonnay, Chekov imperial vodka, and J2O apple and mango) to represent drinks commonly used by women in the 16 to 24 years old age group. Based on the retention index and mass spectrum, compounds are identified. To ensure results are based on the drugs present in drinks only, not by some other drink component, and an unspiked sample of each beverage is prepared. It is analyzed identically with all other samples. The data obtained after analysis of the standard drugs and drugs extracted from drinks were identical concerning retention index and mass spectrometry. It is allowed the identification and quantification of the drugs. It proves that diazepam, flunitrazepam, and temazepam can be detected in given five beverages for 25 days after storage at both room temperature and 4oC. It was found out that there were stability issues with Flunitrazepam and Temazepam. The study demonstrates samples analyzed as soon as possible after seizure regardless of how they are stored. It is not possible to determine the initial concentration of the drug present in the drink at the time of administration due to the decomposition of the benzodiazepines. The advantage of the method used by them is that it covers thermally stable and labile (temazepam) benzodiazepines. By derivatization using BSTFA-TCMS, we can overcome thermal lability. Moreover, Andresen-Streichert, et al. [3] presented a case study in which a four-year boy is intoxicated with xylazine for sexually abusing him. On clinical examination, a puncture wound is

observed on the left buttock, and a small bloodstain was present in correspondence to the position of skin defect on clothing worn by the boy. No other injury is found on his body. Urine and serum sample of the boy was collected for toxicological analysis. In toxicological analysis, it was found out that xylazine was present in his samples, and on quantification by GC/MS after solid-phase extraction, 0.053 mg/l xylazine was found in serum. Approximately 0.63 mg/l was found in urine. Xylazine is the narcotizing agent in animals, and it is chemically related to neuroleptics of the phenothiazine group and the anti-sympathomimetic clonidine. It acts as a stimulating agent and stimulates the alpha2-receptors in the central and peripheral nervous systems, which results in deep sedation with respiratory depression. It has a narrow therapeutic index so that doubling or tripling the dose can lead to a collapse of the animal secondary to circulatory collapse or respiratory depression. When used in humans, it can cause unconsciousness, hypotension, bradycardia, hyperglycemia, apnea, and coma. The most common route of administration is intramuscular, but intravenous and oral administration is also reported in a few cases. However, Mehling, et al. [25] presented a case report in which a six-year-old girl died after her uncle sedated her with GHB to abuse her sexually. The offender synthesized GHB salt at his home only by using the precursor GBL and sodium hydroxide. The samples stored for analysis at post-mortem were cardiac blood, liver, kidney, brain tissues, bile, vitreous humor, and hair. All of these samples were analyzed using LC-MS/MS. In the result of the analysis following concentration of GHB was found in cardiac blood: 150 mg/l; bile: 292 mg/l; vitreous humour: 58 mg/l; liver: 100 mg/kg; kidney: 124.5mg/kg, brain: 110 mg/kg. Very high GHB levels were found in the proximal part of the hair sample (about 40.9ng/mg). At the same time, interpretation of GHB concentration in biological samples, advanced putrefaction, and sample storage must be considered because these factors can induce increased concentrations in post mortem samples, especially when samples are not stored with a preservative like sodium fluoride. Consequently, Narang, et al. [26] aimed to develop a low-cost, naked eye assay test to indicate the presence of date rape drugs in alcoholic beverages. The device created can be linked to a mobile app, and a message can be sent through the app to a selected number in case of danger. The researchers clubbed together a paper-based microfluidic device, naked-eye detection, and smartphone app to invent a device. The device constructed consists of a circular region of diameter 20mm for the addition of reaction mixture and a predesigned rectangular region (3mm*30mm). Before adding the final reaction mixture solution containing the date rape drug, the circular region is pre-deposited with Bromocresol Green (BCG). Cresols are methyl phenol functional groups containing compounds. Upon interaction with ketamine, BCG changes color due to the protonation/deprotonation mechanism of the hydroxyl groups on the two substituted phenols. U.V. visible spectroscopy was also performed for assay of DRDs, and resulting spectra were compared. MATLAB algorithms are used for colorimetric identification. They automatically locate the region of interest (ROI). The optical density of ROI of the sample is compared against the available optical density dataset of colors produced. If the results were positive, the next step in action begins, utilizing the smartphone app, which is based on artificial intelligence. It analyses the image captured, and if ketamine is present, it switches to the next step, which is calling and messaging police, parents or friend, etc., depending on which number is selected by the app's user. The test was carried out using different concentrations of ketamine only in various beverages like Pepsi, rum, and whiskey. According to Xiang, et al. [27], sometimes toxicologists are encountered with drugs that are not on the routine testing list. This paper was focused on identifying new designer drugs which are not known and are not listed in the routine testing list. A milky fluid is extracted from the sample of an actual case. It was analyzed using 1H-NMR, LC-QE, and GC-MS. By using LC-QE, accurate masses and cluster ions isotope patterns of given unknown compound was obtained. Based on the protons number of 1H-NMR, the molecular formula of the unknown compound is confirmed to be C16H12C2N2O. After the analysis was complete, it is found out that the compound present in the milky fluid is a new designer benzodiazepine as diazepam. For further detection of unknown new psychoactive substances, combined application of the various method is required, like using LC-QE, GC-MS, and 1H-NMR, as done in this case. In contrast, Busardò, et al. [28], a study was conducted using different resources. One resource was 256 female patients from the Sexual Assaults Centre of Careggi University Hospital in Florence, Italy, between January 2010 and July 2018. Databases like PsycINFO, PubMed, and Scopus using different search terms like "drug-facilitated sexual assault," "chemical submission," "date rape," "rape drugs," and "drink-spiking" were also used. They also included reports from the websites of international agencies or institutions, including the United Nations Office on Drugs and Crime (UNODC), the World Health Organization (WHO), and the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). This study focused on victims of alleged DFSA aged 16 years and over when toxicology results are reported. The results revealed no accurate estimates of the number of DFSA occurring each year, although assaults are increasingly reported. Many DFSA, however, are still not reported. Most of the time, victims do not report the incident of sexual assault because of embarrassment, guilt or because they do not clearly remember the incident. Another major reason for underreporting is that most of the drugs typically used in sexual assaults are rapidly metabolized, making them undetectable in routine drug screenings.

Discussion

The sexual assault which occurs without consent and by intoxicating the victim is called drug-facilitated sexual assault. Sometimes assailant takes advantage of people already under the influence of drugs or alcohol. Most of the drugs used for this purpose are central nervous system depressants. They are rapidly metabolized and have a short half-life. It is difficult to detect them in biological matrices if the time elapsed between the incidence and collection of evidence is more. Under this situation, only hair can give reliable results. These drugs are commonly called date rape drugs.

There is a need to stay alert and keeping things in mind that can prevent us from being prey to assaulters whose intentions are to slip drugs into our drinks while we are in a bar or club, or party. Like we should not drink from a can or bottle that we didn't open or from a punch bowl or from a container that is passed around. If someone offers a drink in a club or bar, or party, we should not take it. Instead of that, we should order our own. By doing so, we can see our drink getting poured and be sure that it is not spiked with some drug. You should never leave your drink unattended when you go dancing or use the restroom or attend a phone call, and if in case you left it solo, you should not drink it and get a new one. If you feel like your drink has some unexplained residue or tastes different or smells different, you should not drink it. If you went out to a club or a bar with a friend, watch out for each other. If any one of you feels dizzy or has a headache after having a drink, leave that place immediately and go to some safe place.

Conclusion

Drug facilitated sexual assault is a topic that is very underrated in India. Half of the people don't even know about it, which makes it a pressing issue. It is essential to spread awareness about drug-facilitated sexual assaults, especially to college students and working professionals, as they are more prone to be victims. The students go away from their homes to study, get excited about parties and try new things. They should be aware of these drugs, so they should not fell prey to them. Working professionals who often go out to have drinks with their clients or colleagues should know about these drugs. Government should start a campaign to educate people about the topic and how they should deal with the situation if they have been a victim of it. Pamphlets are spread across the campuses to students aware of it. Nowadays, social media plays an essential part in everybody's life to spread awareness about this issue. More helplines should be explored to help the victim deal with the incident as there are very high chances of the victim getting depressed or suffer from some mental issue.

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