

Effects on the Psychomotor and Cognitive Skills of the Occasional User of Synthetic Psychotropic Substances

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1. Abstract

Synthetic drugs are gradually changing the landscape of drug addiction in Europe, according to the annual report of the European Monitoring Center for Drugs and Drug Addiction (EMCDDA), which reports a reduction in cannabis and heroin use but an increasing prevalence of synthetic psychotropic substances, especially among young people. A synthetic drug appears every week in Europe, when the years 2000-2005 came out five a year. According to a UN report, synthetic drugs, "legal psychotropic drugs" or "psychotropic herbs", are an increasingly important public health challenge in many countries. The number of cases from the use of such substances increases significantly, while several deaths are reported after the use of these substances. The purpose of this study is to show cognitive deficits in a young female patient with a history of GHB use. The case of a 29-year-old woman who was treated at a university psychiatric clinic in Thessaloniki / Greece is presented.

2. Gamma-Hydroxybutyrate (GHB)

G-Hydroxy Butyrate (GHB) was first formulated in France in 1960 and was first used in medicine as an anesthetic, which had a mainly sedative / sedative effect rather than a painkiller. It is a potent Central Nervous System (CNS) depressant that has a history of limited therapeutic use [1, 2]. In recent years it has been linked to cases of sexual abuse due to the fact that it is unknowingly added to the victim's drink and causes memory loss and inability to

resist [3]. Users take it because in small doses it causes euphoria, relaxation, reduced inhibitions and suppression [4]. GHB overdose poisoning causes vomiting, profuse sweating, severe respiratory depression and loss of consciousness. Chronic use of the substance leads to tolerance to its effects as well as physical and psychological dependence. Other names among the users for GHB are: liquid Ecstasy, G, Georgia homeboy, somatomax, ecstasy of the poor [5]. The prevalence of GHB use in both the general and student populations remains low, but targeted surveys of regular club populations typically report higher prevalence rates [6]. This is due to the fact that GHB is a very cheap and easily accessible substance. In the USA, this substance has no recognized medical use, but in Europe it continues to be used in anesthesia, and in the treatment of insomnia, anxiety, as well as (eg in France) at various stages of childbirth, especially for protection of the baby from cell damage caused by lack of oxygen (hypoxia) [7,8]. In the US, researchers have sought to categorize it as a new drug under investigation, to use it for specific conditions such as lowering cholesterol, relieving symptoms caused by alcohol and opiate withdrawal syndrome [6]. Although its use as an anesthetic has been shown to be limited, the fact that it induces deep sleep has made it an attractive commercial proposition for the treatment of insomnia, and thus marketed legally in Europe without a prescription [9]. The type of sleep induced by γ -hydroxybutyrate (GHB) contributes to muscle growth and thus has spread to health food stores and gyms [10]. At lower doses than those under anesthesia, the drug causes a state

of euphoria, which also attracted the interest of dancers at rave parties - so it became a club drug [2]. However, some cases of overdose deaths led to its ban in 1990. In the UK, GHB has been linked to sexual assault and has been dubbed a "rape drug" [11].

2.1. Way of Use

GHB is consumed orally and is a colorless, odorless liquid with a slightly salty taste, sold in small bottles and online [12]. Its commercial packaging may have a warning label, which prevents its use with alcohol. GHB has also been released in powder and capsule form [13]. Doses of 500 - 3000 mg can cause euphoria, intense experience of music and movement, increased sociability and / or poisoning. A dose of 500 - 3000 mg corresponds to about 0.5 - 3 ml of liquid, in a concentration ratio of 1 g / 1 ml [14]. The effects of using GHB can last from 1 ½ to 3 hours or more, if a higher dose is consumed, or mixed with alcohol. The standard dose of pure GHB powder (1-3 grams) is usually dissolved by users in water or fruit juice. Someone who is addicted can increase the dose to 4-5 grams [15]. However, it is difficult for the average user to know how strong the solution is, unless he knows the initial purity of the powder and the amount of liquid in which it was dissolved. Easy manufacturing, easy supply, cheap price and immediate results are the main reasons for the rapid spread of GHB [16].

3. Results of the Use of Gamma Hydroxybutyrate (GHB)

The action of GHB starts from 10 minutes to one hour after taking it and has been reported to last up to at least 24 hours [17]. GHB, like alcohol, in small doses removes social inhibitions and increases libido [18]. Some users have likened its action to that of "Ecstasy", hence the name "liquid Ecstasy" [19]. Even with moderate use, the user may have blurred vision, loss of balance, or dizziness [20]. Some users may also suffer from burns on the lips and mouth if the solution used is not well mixed. At higher doses, the person begins to lose control, such as someone who is very drunk or taking barbiturates [21]. Euphoria gives way to a strong sedative effect, and there are reports of nausea, vomiting, muscle stiffness, disorientation, convulsions, coma and respiratory failure. Because the drug acts very quickly, someone who has taken a large amount can fall into a coma within half an hour [22]. However, although symptoms such as coma can be very frightening - especially for the patient's friends and relatives - those who have been treated for these symptoms have had a quick and complete recovery, but remember very little of what has happened [23]. There are many reports of fatal mixtures of Gamma Hydroxybutyrate (GHB) and alcohol. We know that the risks are multiplied by the mixing of this substance with other sedatives, and are determined by the weight and sex of the person consuming it, the general state of health, etc. [24]. Research has shown that long-term use of GHB can cause seizures and liver failure [23]. Substance abuse can quickly lead to overdose and inability to be eliminated from the user's body with

possible coma, respiratory distress and death [24].

3.1. Short-Term (Immediate) Side Effects of GHB Use

The drug causes irritability, excessive speech, relaxation, loss of coordination, difficulty in attention, dizziness and drowsiness [23].

3.2. Long-Term Side Effects of GHB Use

Taking GHB for a long time causes hallucinations, constant incoherent speech, headaches and tremors. When combined with alcohol it leads to reduced seizures and loss of consciousness [23].

3.3. Factors Affecting the Results of GHB Use

The results of the use of this substance show that they are affected by a number of factors such as the amount of the substance, its specific type, height and weight of the user, his state of health, his mood, previous experience of substance use, as well as and whether it is used concomitantly with other substances or alcohol. However, what most studies emphasize is the fact that the boundaries between the amount of GHB consumed to produce the desired effects by the user and the amount dangerous to his health are very limited [23].

3.4. Physical and Psychological Dependence

As with any sedative, there is the possibility of physical and psychological dependence on GHB. Some withdrawal symptoms have been reported up to 2 weeks after use, and include dizziness, headache, nausea, vomiting, tremor, amnesia, and difficulty breathing. In small doses its effect is similar to that of alcohol. It causes euphoria, relaxation, lifting of inhibitions and drowsiness depending on the amount of substance used. It is also used by alcoholics as a self-medication to treat insomnia, depression and other alcohol withdrawal symptoms [24]. In large doses, the suppressive effect of GHB can lead to sleep, coma, convulsions or even death. Systematic use of GHB causes tolerance and dependence, while substance abuse often causes insomnia, anxiety, tremor and sweating. The withdrawal symptoms that result from the psychological and physical dependence that GHB use can cause are: insomnia, anxiety, stress, tremor, sweating, loss of appetite, irritability, tachycardia, chest pain, muscle tightness, pain in sound, light and touch, discomfort (dissatisfaction), mental inactivity [24].

4. Case Study

She is a 29-year-old female patient, a private employee with a history of Gamma-Hydroxybutyrate (GHB) use who was examined in the outpatient clinics of a university general hospital due to disturbances of consciousness in the context of use of complex psychotropic substances and was offered hospitalization. . No cases of destructiveness, suicidal ideation, suicide attempt or involvement with the law were reported, while the patient's attitude was friendly, cooperative and presented with normal speech. The patient described herself during childhood - adolescence and early adulthood as a "closed" person of low sociability, without many

friends, with little participation in activities, with difficulty in developing interpersonal relationships and compulsive behaviors. At the age of 25, trying to fight her stress, and at the urging of a friend, she used synthetic psychotropic substances, mainly GHB, and showed a change in her behavior with reduced stress, increased self-confidence and social activism. She stated that she takes this substance occasionally in order to give her the feeling of autonomy and relaxation. In the last two months there have been episodes of fainting and episodes of psychomotor anxiety. For four months he attended an external detoxification program in a structure without interrupting or reducing the use of the synthetic substance. Blood tests were normal and the brain imaging showed no abnormalities. The thyroid gland ultrasound was within normal limits, while the problematic psychometric tests TAT and Rorschach showed an image of marginal mental function very close to the psychotic spectrum with forced and schizotypal elements.

4.1. Neuropsychological Assessment

The main goal of the patient's neuropsychological assessment was to assess psychomotor skills and to investigate possible cognitive deficits using a basic set of tests that examine the major points of cognitive behavior and performance. Specifically assessed: levels of attention and concentration, visual perception, learning ability, memory parameters (verbal, visual, working, long-term), verbal functions and academic skills, visual-spatial and visual-constructive ability, abstract thinking, information processing speed, ability to form concepts, and executive functions. From the history and the course of the patient's recovery did not arise in the first year the need to go beyond the basic set of assessment of cognitive abilities and add specialized tests. Neuropsychological examination focused on memory function (Story memory, reverse number retrieval, verbal flow test), attention (stroop, direct number retrieval), and executive functions (Trail Making Test, cube test,anoi tower). The scores on both immediate and long-term memory tests (story memory, reverse number retrieval, verbal flow test) appeared deficient for the patient's age and cognitive level. Regarding the long-term retention at the specific time of the evaluation, difficulties were observed in the tests that allow the conceptual organization of the data to be memorized (memory of stories). The maintenance of mnemonic traces concerning general knowledge (declarative memory) fluctuated at normal levels. The attention span fluctuated at very low levels as indicated by the slow execution of the AD part of the Trail Making Test but also by the performance in the Stroop interpolation condition. In general, the patient's performance in information processing speed, learning, memory, and executive function ranged below normal for her age and level of education at that time. In particular, the patient showed reduced accuracy and speed of visual attention in a different type of reaction, difficulty in abstract thinking and parallel processing of information according to its performance in the individual tests

of the neuropsychological array the criteria for moderate cognitive impairment with the presence of deficits in the dimensions of retained attention (ability to maintain a consistent behavioral response), alertness (ability to respond to response), and alertness (general stimulus receptivity and response readiness). It showed deficits in the dimensions of both immediate and long-term memory. The patient showed that she maintains at normal levels the ability to perform daily activities as well as to assess/control reality.

5. Conclusions

The ability of this synthetic psychoactive substance GHB to cause loss of consciousness, its use poses a high risk to the health of users. It seems that occasional use (at irregular intervals) has the potential to cause damage, possibly reversible, to the psychomotor and cognitive skills of the individual. In particular, the use of GHB shows that it affects certain aspects of the intellect, mainly parameters of attention, the ability to concentrate, the speed of information processing and memory. The patient's age is a strong prognostic factor since the use of GHB is limited to young adult life. The patient's neuropsychological pattern generally refers to typically delayed test performance, and impaired memory, concentration, and attention. The possibility of verbal formation of concepts is normal, while no particular deficiencies were observed in the visual-constructive and visual-perceptual ability. The delayed reaction-response times to the visual-tracking tests (parts A and B), as well as to the individual conditions of the Stroop test are a strong indication of a slowing of the mental processing. Processing delay generally occurs in attention deficits and is associated with poor concentration, difficulty performing two simultaneous projects, and deficient short-term memory. Possible improvement of the deficits remains to be confirmed by neuropsychological re-assessment after a period of six months of complete abstinence from substance use.

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