

Possible relationship between the use of psychoactive substances (drugs of abuse), with cases of anxiety evidenced in the COVID-19 pandemic

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Abstract: The increase in cases of anxiety during the pandemic is related to the use of drugs of abuse. Social toxicology is a study of the harmful effects of drugs and drugs without a prescription that can harm both the individual and society. This study aims to understand the relationship between the increase in anxiety cases with drug use. It consists of exploratory-descriptive bibliographic research, with a qualitative approach, based on articles and book, from 2016 to 2021. Among the drugs most used

in Brazil are alcohol, cocaine, marijuana and benzodiazepines. With the false concept of safety over a given substance, people associate therapeutic purposes with abusive consumption. Care should be, in self-medication and in the search for comfort in something that in the long run can do harm, and do not seek therapies that actually work, with suitable professionals, so that these drugs are used in a beneficial way to health.

Keywords: Social toxicology. Drugs of abuse. benzodiazepines

1. Introduction

Social toxicology is a study of the harmful effects of drugs and drugs without a prescription that can harm both the individual and society. The consumption of drugs of abuse has increased in the pandemic of COVID-19, and are considered fair abuse because they are used intentionally without a medical prescription or differently from the prescribed one (PERELLÓ *et al.*, 2021).

Abuse drugs are chemicals that are often used as recreation, by bringing pleasant sensations, or even to supply some unpleasant feeling. With the growth in the number of people infected by COVID-19, public authorities have adopted measures of social isolation, generating widespread anxiety in society, and consequently this is related to the increase in drugs of abuse. Among the most used in Brazil are alcohol, cocaine, marijuana and Benzodiazepines (LIRA *et al.*, 2021).

According to data from the research conducted by the Oswaldo Cruz Foundation (FIOCRUZ), there was an 18% increase in alcohol consumption and 34% of tobacco in the pandemic, and this increase was associated with feelings of sadness and anxiety (ARAÚJO *et al.*, 2020).

It is emphasized that all drugs of abuse cause biochemical and pathophysiological alterations, are tied to one or more brain proteins, transform the functioning of receptors or neurotransmitters and, later, alter sensations and behaviors (FUENTES *et al.*, 2019).

It is important to emphasize that some people who already suffer from anxiety disorder or other disorders end up resorting to substances that reduce the anxious symptoms caused, without seeking adequate medical care (FUENTES *et al.*, 2019).

According to the Brazilian Psychiatric Association (ABS), psychiatric physicians from 23 states in the country were interviewed, and 89.2% of the physicians interviewed highlighted the worsening in their psychiatric patients, as well as anxious symptoms and depression, panic disorder, and significant changes in sleep, due to the COVID-19 pandemic. The research aims to understand the relationship between the increase in cases of anxiety and the use of drugs of abuse.

2. Methodology

The present work consists of exploratory-descriptive bibliographic research with a qualitative approach, which seeks to explore the increase in cases of anxiety in the pandemic period and the relationship with the abusive use of drugs and drugs.

The basis for the composition of this article was SciELO, Virtual Health Library, with the descriptors: drugs of abuse, social toxicology, benzodiazepines and pandemic. With articles from 2016 to July 2021, scientific journals and books related to the subject.

3. Results and Discussion

The increase in cases of anxiety in the pandemic period because of COVID-19, isolation measures were taken to contain the virus, and with this created favorable spaces for the triggering and worsening of mental pathologies such as anxiety, depression, insomnia, anguish, stress and panic disorder, along with abuse of some substances (LIRA *et al.*, 2020).

Drugs can be classified as Central Nervous System (CNS) depressants, CNS stimulants and also have CNS disorders. Among the most common used in Brazil are alcohol (being a licit drug), cocaine, marijuana and benzodiazepines. Thus, these drugs mentioned above are capable of producing manifestations similar to those of illicit drug use, without the need to mix with other drugs. This is due to drug addiction and favors abuse. Having a good lip solubility, they are easily distributed throughout all tissues, having a greater propensity to the CNS (FUENTES *et al.*, 2019; DORTA *et al.*, 2018).

3.1 Marijuana

It is an illicit drug, being the most used in Brazil. It is used more often by young people over 12 years of age. Cannabis as marijuana is known scientifically, has more than 400 active principles, 60 of these are cannabinoids, some still unknown as active principles. Also present is the psychoactive substance Δ^9 THC (delta tetrahydrocannabinol) substance that requires more research, and more other substances are present in the plant such as Δ^8 THC, cannabidiol and cannabinol. When smoking as is normally used these cannabinoids have additive, synergistic or antagonistic effects in relation to THC (DORTA *et al.*, 2018).

Marijuana is no longer only used as a cigarette, it is also used for tea, made from its leaves and being used in foods such as cake and “brigadeiros”. The amount of THC may vary according to the origin of the drug and its form of use. The effect of THC on the brain will depend on the dose consumed; the earlier the use of marijuana the more harmful it becomes. From the different formulation of the drug can be absorbed soon after its route of administration. Biotransformation is hepatic and can be eliminated in urine, feces, sweat, saliva or hair (DORTA *et al.*, 2018).

In pulmonary absorption the detection of THC is in plasma, a few seconds after a puff of cigarette, this happens because the lungs have an alveolar surface, in addition to an extensive network blood vessels with high flow. Bioavailability will depend on the depth and inhalation and duration of the swallow (PERELLÓ *et al.*, 2021).

After oral administration, absorption will be done by the gastrointestinal tract, being slow and irregular, having a very low bioavailability with values of 6 to 7%. In the distribution THC is distributed throughout the endogenous part, its presence of onset is in plasma and in minutes in highly irrigated organs, the lung, heart, liver and brain (DORTA *et al.*, 2018; PERELLÓ *et al.*, 2021).

The biotransformation of THC happens in the liver by enzymes catalyzed by cytochrome P450. Biotransformation also happens in the lungs and heart. The elimination is slow and can spend weeks to completely remove the metabolites, and this after the cessation of marijuana use (DORTA *et al.*, 2018). Due to THC and its effects on circulation, it may manifest in a myocardial infarction, this in individuals who already have a predisposition to the event, or who are already a hypertension problem (DORTA *et al.*, 2018; PARANHOS *et al.*, 2020).

The potential for dependence is mild to moderate, having a tolerance when exposure occurs at high dosage, especially tachycardia and euphoria, signs of abstinence may be mild, even if it has been used in high doses, but are accompanied by irritability, nausea, insomnia, tremors, anorexia and salivation. Marijuana for those who are predisposed may induce psychotic behaviors (depression and anxiety) and schizophrenia (DORTA *et al.*, 2018; PARANHOS *et al.*, 2020).

With the acute use of cannabis, adverse effects such as impaired memory, decreased motor coordination may appear, among others. For the effects of chronic use, paranoia and psychosis can be presented, this in high doses; dependence is for those who started with use since adolescence, and there was also altered brain development with cognitive impairment (DORTA *et al.*, 2018; PEUKER *et al.*, 2010).

3.2 Cocaine

A psychostimulant substance, alkaloid, extracted from the plant *Erythroyllum coca*. It is a drug commonly used in powder form or dissolved in water to be used intravenously. Cocaine (COC) has rapid effect taking around 8 seconds to appear its effects, after being aspirated it can reach maximum plasma concentration. In addition to coc itself, another substance when inhaled is also absorbed into the airways, because there are other adulterants in the processing of the drug (DORTA *et al.*, 2018).

For the distribution the COC binds to plasma protein, having greater affinity for alpha-glycoprotein acid, and thus presents a rapid distribution and is quickly distributed to the CNS, besides this is also distributed to the peripheral organs, acting directly in the dopaminergic region. The bioavailability that can vary, depending on the temperature, for vaporization, the container where the drug will be heated

and the effectiveness of the swallow that can be 70% in the intranasal route, and can vary from 49% and 94%. When there is an overdose, bioavailability in the blood becomes smaller, if it was administered by airway (DORTA *et al.*, 2018; PARANHOS *et al.*, 2020).

For the elimination of cocaine, biotransformation is done in the liver and blood, the molecule is transformed into Ester-methylbenzopineandanine, being a very large molecule, only small amounts are eliminated by urine (PARANHOS *et al.*, 2020).

In addition, this transformed bio content becomes a hepatotoxin, which also ends up acting on the brain, being pharmacologically active. Cocaine may remain longer in the body when administered with alcohol, as it forms an action of carboxylesterase, being a transesterification substance called ethylene coca (EC), ethylcocain or Ester-ethylbenzgonine; it is apolar, and this causes this substance to remain longer in the body (DORTA *et al.*, 2018).

3.3 Alcohol

Alcohol is a licit drug, it is one of the substances that be related to behavioral changes, producing more euphoria, joy, disinhibition among other effects. Ethanol as alcohol is known is a depressor of the CNS (PARANHOS *et al.*, 2020).

Alcohol binds to several receptors, but to the Gaba receptor that is the same receptor as therapeutic substances bind, the effects on it facilitate the release of neurotransmitters, causing them feelings of pleasure (Dorta *et al.*, 2018). Absorption happens in the stomach and small intestine, and around 5 minutes after its ingestion it passes into the bloodstream; it has a rapid distribution, and can cross the placental barrier and the hematoencephalic barrier; Biotransformation is hepatic. Thus, for its detection, the blood or exaggerated air of the individual is used (DORTA *et al.*, 2018; PARANHOS *et al.*, 2020).

3.4 Benzodiazepines

Benzodiazepines are hypnotic and anxiolytic drugs widely used in clinical practice. They are often prescribed in the treatment of problems related to the central nervous system (NOLATO *et al.*, 2016).

Long-term use of this drug is a risk, even if it is in small doses. Being widely used inappropriately, resulting in the abusive and irrational use of benzodiazepines. And with this can be developed the dependence, having the signs of headache, mental confusion, hypotension, agitation, gastric problem, tremors among others (DONATO *et al.*, 2018; NOLATO *et al.*, 2016;).

When administered orally it is then absorbed into the intestinal tract, distributed in all organic tissues, having a high lip solubility, being metabolized in the liver, and excreted by urine (DORTA *et al.*, 2018).

Its indiscriminate use is one of the serious problems and involves concomitant consumption of alcoholic beverages. Like ethanol, benzodiazepines act by depressing the central nervous system, resulting in a synergistic sedative

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effect (NOLATO *et al.*, 2016).

In relation to their therapeutic effects, cannabinoids have the clinical capacity to regulate anxiety and depressive symptoms, but with their misuse or recreational use, has its adverse effects, being depressive symptoms and anxiety, the risks of dependence happen when used in high dosage (PARANHOS *et al.*, 2020; BELLOCCHIO *et al.*, 2021).

Cocaine "With excessive dosage can produce tremors and convulsions, followed by respiratory and vasomotor depression and causes strong psychological dependence" (PARANHOS *et al.*, 2020).

Alcohol with its chronic use causes neuroadaptation with decreased GABA receptors and increased glutamate receptors, being an amino acid that acts as an excitatory neurotransmitter resulting in tolerance and dependence (PARANHOS *et al.*, 2020).

With the false concept of safety benzodiazepines, it is often associated with medical prescription for therapeutic purposes to abusive consumption, and may not be used intentionally, as when it is due to ignorance or cognitive impairment, being very common in the elderly and people with little knowledge. Benzodiazepines have no recurrent adverse effects, but with misuse causes dependence. Next, according to Fuentes *et al.* (2019), these are widely marketed and sought by people, for the treatment of sleep disorders, anxiety, among others, and this without the medical prescription, leads to abusive use (DORTA *et al.*, 2018; PERELLÓ *et al.*, 2021; FUENTES *et al.*, 2019).

4. Conclusions

From the results, it is noted that there was an increase in cases of anxiety in a difficult period, in which everyone was locked in the house, without seeing family, friends and we were forced to do this because of the pandemic, and consequently this brought us the increase in drugs of abuse.

All these drugs are doors to addiction and for those who have a predisposition, they are gateways and aggravating to anxiety, depression and even schizophrenia.

Thus, people self-medicated, in a disorderly way, and these drugs in the body, affect the CNS, acting on the same receptors, of therapeutic substances, causing adverse effects and/or abuse, when used in this way.

Care should be, in self-medication and in the search for comfort in something that in the long run can do harm, it is necessary to seek therapies that really work, with suitable professionals, so that these drugs are used in a beneficial way to health.

References

- [1] ARAÚJO, R.; MALUF, A. Increases use of alcohol, cigarettes and other drugs in the pandemic. *Science and Health*, 2020. Available from: <https://mais.opovo.com.br/jornal/ciencia-e-saude/2020/09/27/aumenta-uso-de-alcool--cigarro-e-outras-drogas-na-pandemia.html> Access: 18 Oct. 2021.
- [2] CUNHA, A.M.G. *et al.* *Manuel de Farmácia: Criminal And Analysis, Chemical, Physical and Toxicological Expertise*. 2nd edition, Editora Sanar, v. 4, p. 1-320, 2020.
- [3] FUENTES, J.G.; BARLY, L.P.; GONZÁLEZ, Y.G.; MACHADO, A.D.; PUERTO, O.G. Acute intoxications for medicines consumed for the purpose of abuse. *Cuban Journal of Military Medicine*, v.48, n.3, p.1-10, 2019. Available in: <http://www.revmedmilitar.sld.cu/index.php/mil/article/view/227/359>. Accessed: 25 Aug. 2021.
- [4] LIRA, A.V.A. A.; PEREIRA, N. A.; RAMOS, L.A.I.A.; PACHÚ, C. O. Pandemic Of Coronavirus and Impacts on Mental Health: An Integrative Literature Review. *Rev. Psicol., Divers. Health*, n.10, v.1, p.168-180, 2020. Available in: <https://pesquisa.bvsalud.org/bvsm/resouce/pt/biblio-1282792>. Accessed: Oct. 18. 2021.
- [5] MARTINS, B.S.; DORTA, D.J.; COSTA, J.L. *Forensic Toxicology*, 1st edition, Blucher Publishing House, v.1, p.1-750, 2018.
- [6] NALOTO, D.C.V.; LOPES, F.C.; FILHO, S.B.; FIOL, F.S.D.; BERGAMASCHI, C.C. Prescription of benzodiazepines for adults and the elderly of a mental health outpatient clinic, *Ciência & Saúde Coletiva*, n.21, v.4, p.1267-1276, 2016. Available in: <https://www.scielo.br/j/csc/a/C5mWSnzJ68qZ5hqtqJhv pDn/?lang=pt>. Access in: 2 sea. 2021.
- [7] PERELLÓ, M.; RIO-AIGE, K.; ESCOLIES, R.G.; GASCÓN, P.; RIUS, P.; JAMBRINA, AM.; BAGARIA, G.; ARMELLES, M.; PÉREZ-CANO, F.J.; RABANAL, M. Evaluation of Medicine Abuse Trends in Community Pharmacies: The Medicine Abuse Observatory (MAO) in a Region of Southern Europe. *Int. J. Environ. Res. Public Health*, p.1-18, 2021. Available from: <https://doi.org/10.3390/ijerph18157818> Access on: 5 Aug. 2021.
- [8] RAMOS, T.B.; BOKEHI, L.C.B.; OLIVEIRA, E.B.; GOMES, M.S.A.; BOKEHI, J.R.; CASTILHO, S.R. Information on benzodiazepines: what does the internet offer us? *Science & Public Health*, n.25, v.11, p.4351-4360, 2020. Available in: <https://www.scielo.br/j/csc/a/DtG5DTPk8sbVxYr8gRPf ZNw/?lang=pt>. Access in: 2 sea. 2021.
- [9] Psychiatric Care in Brazil Suffer impacts of the COVID-19, 2020 pandemic. Available in: <https://www.abp.org.br/post/atendimentos-psiquiatricos-no-brasil-sofrem-impacto-da-pandemia-de-covid-19>. Accessed: 16 Dec. 2021.