NATIONAL SEMINAR ON DRUG ADDICTION AND ABUSE AMONG YOUTH (DAY 2023)

February 28, 2023

PROCEEDINGS

PUBLISHED ON SEPTEMBER, 2023

EDITORS

Dr. Kanchi Siva Prasad

Dr. P. Narayana Raju

Dr. D. Veera Nagendra Kumar

September, 2023; PROCEEDINGS ISBN:978-93-5967-634-0

NATIONAL SEMINAR ON DRUG ADDICTION AND ABUSE AMONG YOUTH (DAY 2023)

February 28, 2023

PROCEEDINGS

EDITORS

Dr. Kanchi Siva Prasad

Dr. P. Narayana Raju

Dr. D. Veera Nagendra Kumar

Organized by

Department of Zoology & IQAC

SKR GOVERNMENT DEGREE COLLEGE, GUDUR – 524 101

TIRUPATI DISTRICT, ANDHRA PRADESH, INDIA

NATIONAL SEMINAR ON DRUG ADDICTION AND ABUSE AMONG YOUTH

Proceedings of National Seminar on "Drug addiction and abuse among youth", February, 28th 2023, Department of Zoology & IQAC, SKR Govt. Degree College, Gudur, Tirupati. Dt.

Editors:

Dr. Kanchi. Siva Prasad
Lecturer in Zoology
SKR Govt. Degree College
GUDUR

Dr. P. Narayana Raju
Lecturer in Physical Education
SKR Govt. Degree College
GUDUR

Dr. D. Veera Nagendra Kumar
Lecturer in Zoology
Government College for Men (A)
KADAPA

Published by SKR GDC GUDUR

Edition 2023

www.pothi.com

978-93-5967-634-0

SKR GOVERNMENT DEGREE COLLEGE, GUDUR, TIRUPATI DT.AP.,

NATIONAL SEMINAR ON DRUG ADDICTION AND ABUSE AMONG YOUTH

S.K.R. Government Degree College, Gudur

Message from Principal

February 28, 2023

Dr Palleti Venkateswarlu, M.Com., M.Ed., M.Phil., Ph.D

The National Seminar on "Drug addiction and abuse among youth" organized by the department of Zoology and IQAC of our college makes me glad to be a part with you in this grand occasion. I hope it is one of the rare opportunities for academicians/ Lecturers/ young scientists / students and those who are interested in this field, provides opportunities to participate and to share their ideas thereby to take constructive suggestions on the emerging trends in the relevant field. On behalf of our institution and my team I extend my cordial welcome to all the participants.

SKR GOVERNMENT DEGREE COLLEGE, GUDUR, TIRUPATI DT.AP.,

NATIONAL SEMINAR ON DRUG ADDICTION AND ABUSE AMONG YOUTH

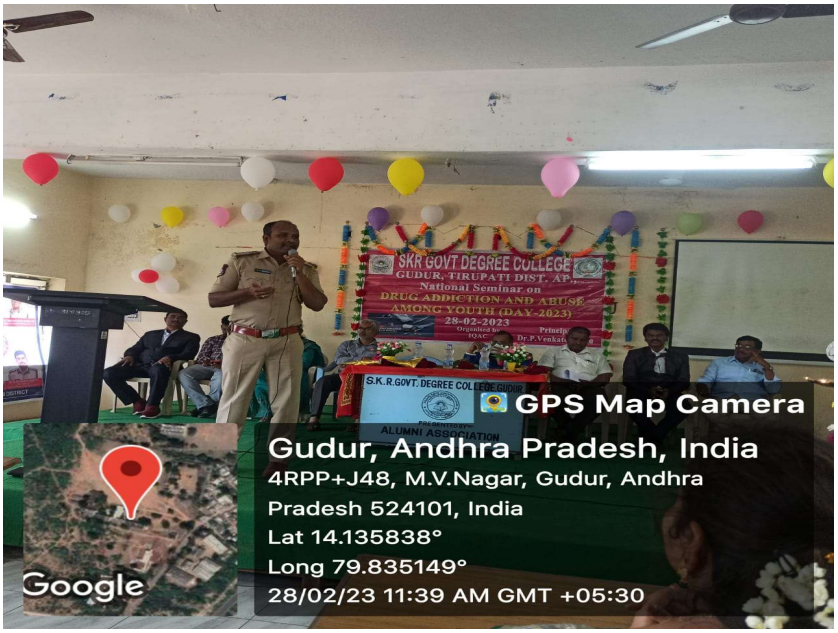
Special Enforcement Bureau: Gudur

PROH.& EXCISE INSPECTOR

Sri . P. Vijaya Kumar, CI

GUDUR

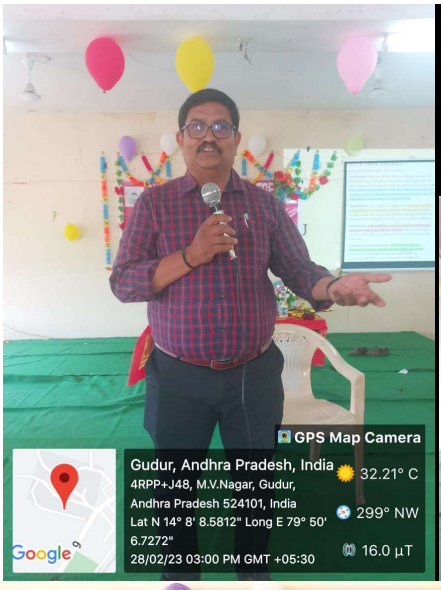
National Seminar on "Drug addiction and abuse among youth" is being held at SKR Government Degree College, Gudur on February 28th , 2023. The seminar has received a huge response and received many research papers, and organizers have selected all the papers for inclusion in the proceedings of the seminar. It is inspiring to note that a number of papers have been received from Degree Colleges. Professors and many other senior Lecturers / researchers will deliver invited talks in the seminar. I hope that the deliberations in the seminar will help students / researchers from and the seminar will provide a platform for inculcating the scientific attitude from all of the students. I wish the seminar all success.

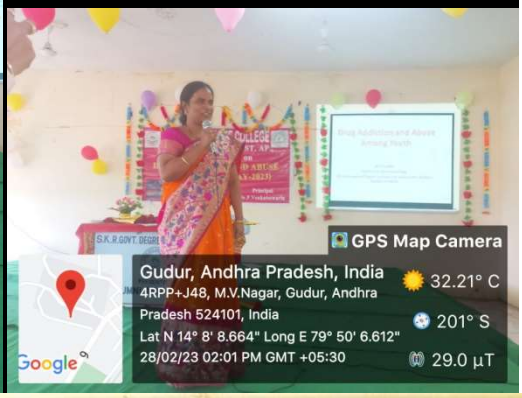


NATIONAL SEMINAR ON DRUG ADDICTION AND ABUSE AMONG YOUTH

SKR GOVERNMENT DEGREE COLLEGE, GUDUR, TIRUPATI DT.AP.,

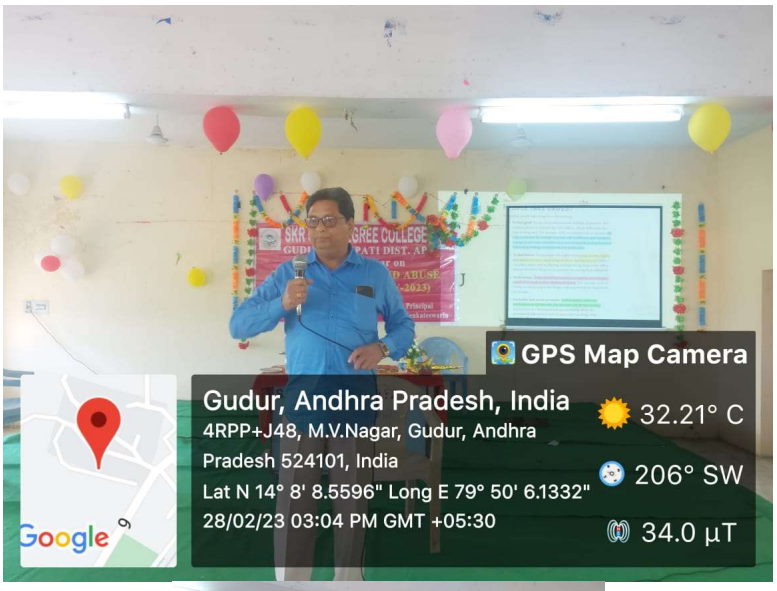
NATIONAL SEMINAR ON DRUG ADDICTION AND ABUSE AMONG YOUTH





SKR GOVERNMENT DEGREE COLLEGE, GUDUR, TIRUPATI DT.AP.,

NATIONAL SEMINAR ON DRUG ADDICTION AND ABUSE AMONG YOUTH



SKR GOVERNMENT DEGREE COLLEGE, GUDUR, TIRUPATI DT.AP.,

NATIONAL SEMINAR ON DRUG ADDICTION AND ABUSE AMONG YOUTH

SKR GOVERNMENT DEGREE COLLEGE, GUDUR – 524 101

Ph. No: 9676841978, email: kanchi1976@gmail.com
Dr. K. Siva Prasad, Lecturer in Zoology

Message from Organizing Secretary

The National Seminar "Drug addiction and abuse among youth" aims to provide a common platform for all scientific community and academia. A number of persons from colleges are participating in this seminar. It is also expected to be a good get- together of senior and young scientists. Department of Zoology, Government Degree College, Gudur has good infrastructure to support research activities. Although the present seminar is a National Seminar, its scope is wider. We wish to thank all the authors, reviewers and invited speakers, members of advisory board and organizing team, student-volunteers and all other who have contributed in the successful organization of the seminar.

I wish to express my deepest sense of gratitude to my judicious and sagacious Principal Dr. P. Venkateswarlu, whose keen, able, friendly advice and encouragement seminar in success. His transfixing instructions and continuous support throughout the way of this seminar.

I express my sincere gratitude to all my colleagues. Dr.G Jansi Vani, Dr.Mohammed Maqsood Ahmed, Sri P S Sridhara Sarma, Dr.Y. Srinivasulu, Dr G V Sri Vallinath, Dr P Vijaya Mahesh Kumar, Smt S Kiranmaiye, Smt B Krupa Karuna Vani, Sri B Ratneswara Rao, Dr K Koteswara Rao, Sri KP Krishna Murthy, Smt MVL Sailaja, Dr G Surendra, Dr P Narayana Raju, Smt B Lakshmi, Smt SK Mymoon, Sri K Ravi Raju, Sri B Peera Kumar, Dr SJM Prathap Kumar.

I never forgotten my friends and colleagues Dr. SB. Sainath, Assistant Prof. of Biotechnology, Vikrama Simhapuri University, Dr. G. Narasimhulu, University, Kebangsaan Malaysia, Dr. M. Ananda Rao, Dr. K.R. Shanmugam, Dr. M. Gurusekhar, Dr. P. Ravi Sekhar, Dr. Y. Savithri, Dr. G. Swathi, , Dr. Nagendra Kumar, Dr. Narasimharao, B. Srinivasa Rao, K. Ngaraju, N. Ganesh, A. Srinivasulu.

I owe my sincere thanks to the non-teaching staff for lending their support and affectionate cooperation in all spheres of this seminar.

Kanchi. Siva Prasad

Organizing Secretary.

SKR GOVERNMENT DEGREE COLLEGE, GUDUR, TIRUPATI DT.AP.,

IQAC National Seminar

on

DRUG ADDICTION AND ABUSE AMONG YOUTH (DAY-2023)

28-02-2023

KEYNOTE ADDRESS:

——“ A GOOD TEACHER CAN STOP YOUTH ADDICTION IN THE BUD “

It is hardly surprising that drug usage has crept into the fabric of many teenage lives in this current era of globalization and technological growth. Drug addiction is one such serious and disastrous problem that has severely trapped the young generation of our country. Even youngsters from low-income families have been discovered to use and become addicted to drugs. Youngsters incorrectly think that abusing drugs and alcohol is a current fashion trend in the twenty-first century.

In many nations around the world, substance use is a serious public health issue. The survey indicates that 11.2 million people were injecting drugs globally. Every day, countless people overdose on drugs, and some even commit suicide by checking themselves into a hospital. Even in rare circumstances, an overdose of drugs can cause death. The most commonly consumed drugs in the world include alcohol and marijuana. Even though these substances are legal in the vast majority of countries, they can still lead to a number of side effects. The United Nations Office on Drugs and Crime (UNODC) estimates that between the ages of 15 and 64, roughly 7% of the world's population used illicit drugs on a regular basis practically everywhere. Young people are using more drugs, with use levels today in many countries higher than with the previous generation. Today, one in four deaths is related to the use of illicit drugs, and more than 7 million people experience an illicit drug disorder.

In India, there are 15.8 million children between the ages of 10 and 17 who are drug dependent, according to statistics. The genuine figure, according to experts, is much higher. Alcohol, followed by marijuana and painkillers, is the psychoactive substance that is most

frequently consumed, according to studies. The Global Drug Report 2022 asserts that India has the highest proportion of opiate users worldwide. With an increase in trafficking, the tendency is predicted to grow. According to the United Nations Office on Drugs and Crime (UNODC), around 7% of the global population used illicit drugs frequently almost everywhere. Students are particularly prone to substance misuse for a number of reasons, such as peer and academic pressure, the allure of popularity and identity, easily accessible pocket money, and relatively simple access to a number of substances, especially in industrial, metropolitan elite areas, such as nicotine (cigarettes).

In reality, drug misuse is more closely linked to illnesses, disabilities, and fatalities than any other illness that can be avoided. Addiction is a complicated disease marked by the inability to stop taking substances or engaging in particularly damaging behaviors. It may have a range of detrimental psychological, physiological, and personal effects. Drug and alcohol addicts are more likely to sustain unintended injuries, have accidents, and experience domestic violence. In addition, addiction is a neuropsychological condition marked by a strong desire to engage in certain behaviors, such as using drugs, despite the harm and other negative effects that result. Drug-using students are more prone to engage in violent and aggressive behavior. It has also been connected to a multitude of mental illnesses, depending on the chemical taken. On the other hand, it has been linked to abnormal behavior, social disorder, and membership in hostile organizations. Teenage substance users suffer risks and negative effects on their psychological, social, and behavioral levels that could manifest physically.

Addiction hijacks the brain, much as cardiovascular disease harms the heart and diabetes harms the pancreas. All types of drugs and alcohol affect a person’s brain’s reward circuit after excessive use. Alcohol and drug use can have a serious negative effect on one's general health. There are a variety of impacts that various chemicals have on the body, from noticeable short-term effects to long-term harmful effects. It is more likely that these effects will endure long after a person stops taking a substance the longer they use it.Long-term usage also alters other chemical systems and circuits in the brain, which impacts mental processes like memory, stress, learning, and behavior. It is now widely accepted that cigarette smoke, methamphetamine, and opiates can all result in overdose and death, cause several malignancies, and cause serious dental issues known as "meth mouth." Moreover, some substances, including inhalants, can harm or even eliminate nerve cells in the brain or peripheral nervous system (the nervous system outside the brain and spinal cord). Some common mental side effects include psychosis, depression, anxiety, and mood changes. Psychosis is often a direct result of drug use, but sadness, anxiety, and mood swings can be both a direct and indirect result of drug use and can persist even after use has stopped. When a person struggles with addiction and a mental health issue, whether it appeared before or after using drugs or alcohol, it is said that they have a dual diagnosis. Dual diagnosis is the most effective course of action in these instances. A significant aspect of addiction is its impact on a person’s personal life, including relationships, family, employment and other obligations. A person with a substance use disorder might not have the self-control to stop using, despite the implications it has on their lives. This kind of chronic illness can drastically alter a person's life and the lives of those close to them.

According to the Indian investigation, a wide range of illegal drugs are still in use despite the existence of stringent drug control laws and a number of organizations dedicated to

reducing drug supply. Drug addiction cannot be cured, however treatment programmes can assist you in breaking the cycle of drug use and helping you stay clean. Several tactics must be used to fight drug addiction. Legal, social, and religious measures are urgently needed to combat drug addiction.

Although the government has implemented stringent steps to end the drug crisis, more drastic action is still required. The rules that are already in place to stop drug misuse should be better enforced, more stringently applied, and implemented.

Drug addiction recovery is notoriously challenging. Setbacks frequently occur. Co-occurring mental health disorders are an important factor that is much too frequently ignored. To solve the addiction and overdose problem, which now claims over 100,000 lives each year, it is essential to treat mental diseases like depression, anxiety, post-traumatic stress disorder,ADHD(Attention-deficit/hyperactivity disorder), and others with drugs or other therapies.

The prevention of teen substance addiction depends heavily on the involvement and support of parents, guardians, and other carers. One of the best methods for adults to engage with children is through conversation. Improved child-parent communication as well as routine parental supervision and monitoring are advised to prevent substance abuse. Drug use can be decreased with the aid of effective parent teaching, family skill development, planned family therapy, and other interventions. Teachers play a significant role in curbing Drug and Substance Abuse (DSA) because they spend much of their time with students. Students prefer to speak with a trusted teacher rather than a family member when discussing personal difficulties. Students can receive assistance from teachers who have received training in dealing with drug issues in finding the right resources and support. Therefore, Parents and teachers should keep an eye on teenagers so that the problem can be rectified at the right time and be solved through counseling. A good teacher can nip underage addiction in the bud before it turns into a problem that’s much, much harder to handle.

Dr.KRISHNA KUMAR VEPAKOMMA
PROFESSOR & PRINCIPAL (Retd.)
GOVERNMENT DEGREE COLLEGE
NAIDUPET - 524126

IQAC National Seminar
on
DRUG ADDICTION AND ABUSE AMONG YOUTH
(DAY-2023)

28-02-2023

Doping and performance enhancing drugs in athletes and sports men

Abstract

The origins of doping in sports go back to the very creation of sport itself. From ancient usage of substances in chariot racing to more recent controversies in doping in baseball, doping in tennis, doping at the Olympic Games, and doping at the Tour de France, popular views among athletes have varied widely from country to country over the years. The use of drugs in sports goes back centuries, about all the way back to the very invention of the concept of sports. In competitive sports, doping is the use of banned athletic performance-enhancing drugs by athletic competitors as a way of cheating. “Doping” refers to the use of banned substances in competitive sports. Performance enhancing

drugs (PEDs) is another term used to for drugs used by athletes to improve their athletic performance. The term *doping* is widely used by organizations that regulate sporting competitions. The use of drugs to enhance performance is considered unethical, and is prohibited by most international sports organizations, including the International Olympic Committee. Furthermore, athletes taking explicit measures to evade detection exacerbate the ethical violation with overt deception and cheating.

The general trend among authorities and sporting organizations over the past several decades has been to strictly regulate the use of drugs in sport. The reasons for the ban are mainly the health risks of performance-enhancing drugs, the equality of opportunity for athletes, and the exemplary effect of drug-free sport for the public. Anti-doping authorities state that using performance-enhancing drugs goes against the "spirit of sport".

Anabolic steroids are synthetically derived from testosterone and modified to have greater anabolic effects. They work by increasing the concentration of nitrogen in the muscle which inhibits catabolic glucocorticoid binding to muscle. This ultimately prohibits the breakdown of muscle and preserves muscle mass. Anabolic steroids are oxandrolone, stanozolol and nandrolone. Anabolic steroids can be taken through a transdermal method, orally, or through injection. Injectable forms of the steroid are the most potent and long-lasting. In general, potential side effects include: muscle hypertrophy, acne, hypertension, elevated cholesterol, thrombosis, decreased high-density lipoproteins, altered libido, hepatic carcinoma, cholestasis, peliosis hepatitis, septic arthritis, psychosis, aggression, addiction, and depression.

Potential side effects specifically in males include: male pattern baldness, oligospermia, prostate hypertrophy, testicular atrophy, and prostate cancer. Potential side specifically in females include: hirsutism, uterine atrophy, amenorrhea, breast atrophy, and thickening of vocal cords. Urine samples are

tested to determine the ratio of testosterone glucuronide to epitestosterone glucuronide, which should be 3:1. Any ratio of 4:1 or greater is considered a positive test. The 1988 Anti-Drug Abuse Act and 1990 Anabolic Steroid Act both deemed anabolic steroids as an illegal substance when not used for disease treatment.

Key words: Doping, Drug addiction, steroids, drug abuse.

Dr. P. Narayana raju
Lecturer in Physical Education
SKR Govt. Degree College
Gudur – 524 101.

NATIONAL SEMINAR ON DRUG ADDICTION AND ABUSE AMONG YOUTH

INDEX

NATIONAL SEMINAR ON DRUG ADDICTION AND ABUSE AMONG YOUTH

NATIONAL SEMINAR ON DRUG ADDICTION AND ABUSE AMONG YOUTH

Alcoholism And Harmful Effects of Alcohol: A Systematic Review

D. Veera Nagendra Kumar [1], P. Sachidevi [2], G. Seethamma [3]

[1]Department of Zoology, Government College for Men (A), Kadapa, A.P

[2]Department of Zoology, SKR&SKR Government College for Women (A), Kadapa, A.P

[3]Department of Zoology, KVR Government College for Women (A), Kurnool. A.P

Abstract:

Alcohol consumption, particularly heavier drinking, is an important risk factor for many health problems and, thus, is a major contributor to the global burden of disease. In fact, alcohol is a necessary underlying cause for more than 30 conditions and a contributing factor to many more. The most common disease categories that are entirely or partly caused by alcohol consumption include infectious diseases, cancer, diabetes, neuropsychiatric diseases (including alcohol use disorders), cardiovascular disease, liver and pancreas disease, and unintentional and intentional injury. Alcohol works on the brain to produce its desired effects, e.g., sociability and intoxication, and hence the brain is an important organ for exploring subsequent harms. These come in many different forms such as the consequences of damage during intoxication, e.g., from falls and fights, damage from withdrawal, damage from the toxicity of alcohol and its metabolites and altered brain structure and function with implications for behavioral processes such as craving and addiction.

Key words: Alcohol, diabetes, brain structure, neuropsychiatric diseases

Introduction:

The phenomenon of adolescent alcohol consumption has been investigated in numerous studies (Hussong, Ennett, Cox, & Haroon, 2017). Many young people try alcohol at some point during adolescence, with the lifetime prevalence of alcohol use among adolescents being as high as 80% (Marshall, 2014). An earlier study reported for example, that up to 70% of adolescents had already tried alcohol by the age of 13–14 years (Bremner, Burnett, Nunney, Ravat, & Mistral, 2011). At the same time, the early initiation of alcohol consumption has been linked to heavier alcohol use in adulthood and an increased risk for alcohol use disorders later in life (Merline, O'Malley, Schulenberg, Bachman, & Johnston, 2004). Alcohol use in young adolescents is especially alarming given the potentially damaging effect that alcohol can have on the developing brain (Squeglia, Jacobus, & Tapert, 2014). some research has shown that the association between alcohol use and externalizing behaviors such as aggressive behavior, delinquency, and hyperactivity is similar in boys

and girls (Colder et al., 2013; Jun et al., 2015), as is the association between internalizing behaviors and early drinking (Parrish et al., 2016),

The World Health Organization (WHO) has estimated that about 2 billion people worldwide consume alcoholic beverages and 76.3 million have diagnosable alcohol related disorders. Both the volume of alcohol and the drinking pattern are of importance for the health outcome. Recent meta-analyses showed that there is a relationship between alcohol ingestion and more than 60 types of disease and injury. The use of alcohol can, depending on the consumption pattern, enhance the risk of health problems such as neurological disorders, alcoholic cirrhosis, fetal alcohol syndrome, and traffic and other accidents, as well as social problems in terms of inability to cope with work, family and other relations, and harm to those in the surrounding environment (WHO.,2008).

Alcohol use is related to wide range of physical, mental and social harms (Abel, 1997). Most health Professionals agrees that alcohol affects practically every organ in the human body. Alcohol consumption was linked to more than 60 disease conditions in a series of recent meta-analyses (Ridolfo and Stevenson, 2001). Alcoholism is a serious problem for any age group that can have pathological effect on several important systems of the body, eg: Central vascular system, central nervous system, liver, kidney function and cognitive function. It is generally accepted that excessive alcohol consumption can induce dramatic changes in the physiological and biochemical processes of the whole organism and in the cells (Oba *et al.*, 2005).

Alcohol exposure to brain can be associated with oxidative perturbation of cellular oxidant/antioxidant balance (Calabrese et al., 2000). Ethanol induces the formation of reactive oxygen species (ROS), such as hydrogen peroxide (H_2O_2), hydroxyl Radical ($^{\bullet}OH$) and superoxide anion radical ($O_2^{\bullet -}$) in different cerebral areas. The main damage to cell after ethanol results from the ROS-induced alteration of macromolecules, such as polyunsaturated fatty acids in membrane lipids, proteins and DNA (Montoliu et al., 1994; Reniset al., 1996). Lipid peroxidations, especially in membranes, play a crucial role in tissue injury (Sahin and Gumuslu, 2004

Oxidative stress takes place when the antioxidant defense and the generation of reactive species are unbalanced. Increasing evidence points to oxidative stress as an important mechanism of alcohol toxicity (Sergent *et al.*, 2001) in as much as alcohol induces peroxidation of membranes lipids and oxidation of proteins and nucleic acids. These effects lead to changes in cellular markers of oxidative stress such as intraerythrocyte glutathione (GSH) in moderate alcohol consumers (Rigamonti *et al.*, 2003), an effect that occurs in conjunction with an activated endothelial production of NO (Hendrickson *et al.*, 1999). Therefore, changes in endothelial function might be the result of an alcohol-induced activation of oxidative stress.

Harmful effects of alcohol

Overall, the following are the main disease and injury categories impacted by alcohol consumption

Cancer, Cardiovascular disease,Infectious disease, Diabetes; Neuropsychiatric disease, Liver and pancreas disease; and Unintentional and intentional injury

i) Cancer

Alcohol has consistently been related to the risk of cancer of the mouth (lip, tongue), pharynx, larynx, hypopharynx, oesophagus and liver (Corrao et al., 2004). The molecular and biochemical mechanisms suggested that these mechanisms differ by target organ and include variations (i.e., polymorphisms) in genes encoding enzymes responsible for ethanol metabolism (e.g., alcohol dehydrogenase, aldehyde dehydrogenase, and cytochrome P450 2E1), increased estrogen concentrations, and changes in folate metabolism and DNA repair (Seitz and Becker 2007).The relationship between average volume of alcohol consumption and cancer is usually characterized as almost monotonically increasing relative risks with increasing volume of drinking (Lachenmeier et al. 2009).

ii)Diabetes:

A curvilinear relationship exists between the average volume of alcohol consumption and the inception of diabetes (Baliunas et al. 2009)—that is, lower alcohol consumption levels have a protective effect, whereas higher consumption is associated with an increased risk.

ii) Cardiovascular disease

Cardiovascular disease is a general category that includes several specific conditions, and alcohol's impact differs for the different conditions. There is increasing research in the past decades about the role of alcohol as both a risk and protective factor for cardiovascular disease. Most studies suggest that low-level consumption equally offers some protection against ischaemic stroke. In contrast, hypertension and other cardiovascular disorders such as cardiac arrhythmias or heart failure are adversely affected by alcohol (Taylor et al. 2009)). There are some indications that hypertension may be related to the pattern of heavy drinking occasions (Neese*et al.*, 2004).

iii) Liver cirrhosis

Alcohol has been estimated as the leading cause of liver cirrhosis in established market economies (Corrao *et al.*, 1999). There is some debate whether alcohol's contributory role should be restricted to alcoholic liver cirrhosis alone or be extended to unspecified liver cirrhosis. Several

authors contend that, empirically, it is extremely difficult to separate alcoholic from unspecified liver cirrhosis, and that the term "unspecified liver cirrhosis" is applied when no specific etiological factor is reported or identified. Research in the United States and in Central and South American countries indicated that an appreciable proportion of cirrhosis deaths without mention of alcohol were in fact attributable to alcohol (Haberman and Weinbaum, 1990).

iv) Other chronic conditions

Other risks of alcohol consumption currently discussed ill the literature include epilepsy acute and chronic pancreatitis and psoriasis. Ethanol itself, besides its metabolic effects is also a stressogenic factor and in combination with other stressor the effects are more probably additive than antagonistic (Albano*et al.*, 2002). It was reported that ethanol intake in rats resulted in increase of catecholamine and corticosterone response to stress. Because high plasma levels of glucocorticoids decrease the sensitivity of tissues to insulin.Caro and the exaggerate response to stress after ethanol intake could affect the insulin binding and insulin receptors in insulin target tissues.

v)Hypoglycemic coma

Consumption of alcoholic beverages is the leading cause of severe hypoglycemic coma and deaths (Koppes *et al.,* 2005). It also been established that alcohol interferes with glycemic control primarily by inhibiting Glucogenesis through an effect of redox state of the liver and hepatic glucose production, and reducing the mobilization of carbohydrates during hypoglycemia.

Alcohol– Brain Metabolism

Alcohol is a natural product of fruit of cereal fermentation and belongs to the family of intoxicant anesthetics that includes volatile anesthetics, barbiturates and benzodiazepines. Ethanol affects almost all body organs, but its effects on the CNS that makes the use enticing. The initial effects are disinhibition and euphoria, but with increasing doses ethanol induces sedation, confusion and incoordination, and further on coma and death may occur (LisaGustafssion, 2007).

Alcohol is frequently consumed by large proportion of the population and can readily cross the blood-brain barrier, entering the central nervous system.Alcohol is oxidized to acetaldehyde most selectively by enzyme cytochrome P.450 2 E1, which is also present in various brain regions. The acetaldehyde further, oxidized to acetate by the acetaldehyde dehydrogenase enzyme which is also present in the various brain regions and capable of producing hydroxyl radicals (Liu *et al.*, 2000). Acetaldehyde can damaged brain proteins and DNA as well as cause lipid peroxidations in membranes.

Alcohol induced brain diseases

i) Fetal alcohol syndrome (FAS) is a disorder of permanent birth defects that occurs in the offspring of women who drink alcohol during pregnancy. It is unknown whether amount, frequency or timing of alcohol consumption during pregnancy cause difference in degree of damage done to the fetus. Thus, the current recommendation is not to drink at all during pregnancy. Alcohol crosses the placental barrier and can stunt fetal growth or weight, create distinctive facial stigmata, damage neurons and brain structures, and cause other physical mental, or behavioral problems (Streissguth, 1997).

The main effect of FAS is permanent central nervous system damage, especially to the brain developing brain cells and structures are underdeveloped or malformed by prenatal alcohol exposure, often creating an array of primary cognitive and functional disabilities (including poor memory, attention deficits, impulsive behavior, and poor cause-effect reasoning) as well as secondary disabilities (for example, mental health problems, and drug addiction. The risk of brain damage exists during each trimester, since the fetal brain develops throughout the entire pregnancy (Guerri., 2002).

Fetal alcohol exposure is the leading known cause of mental retardation in the Western world. In the United States the FAS prevalence rate is estimated to be between 0.2 and 2.0 cases per 1,000 live births, comparable to or higher than other developmental disabilities such as Down syndrome or Spina Bifida. (Fetal Alcohol Syndrome: Guidelines for Referral and Diagnosis (PDF), CDC 2004.). While prenatal alcohol exposure does not automatically result in FAS, the U.S. Surgeon General advises pregnant women to abstain from alcohol use due to the risk of the syndrome (U.S. Surgeon General Release Advisory on Alcohol use in Pregnancy, U.S, DHHS, 2005).

ii) Alcohol Consumption and Alcohol Related Brain Injury

Alcohol related brain injury is more likely to occur if a person drinks heavily on a regular basis over many years. It is possible to develop ARBI over a short period of time, if the drinking is aggressive enough. This can be known as ‘binge drinking’, which means drinking more than six drinks at a time. Safe levels of alcohol consumption include. (Better Health Australia, 2001).

Alcohol ingesting has the greatest impact on risk for alcohol dependence. However, alcohol also has been associated with basically all mental disorders (Kessler et al. 1997). The association between epilepsy and alcohol is much clearer. There is substantial evidence that alcohol consumption can cause unprovoked seizures, and researchers have identified plausible biological pathways that may underlie this relationship (Samokhvalov et al. 2010). Most of the relevant studies found that a high percentage of heavy alcohol users with epilepsy meet the criteria of alcohol dependence.

Conclusion:

This study has shown, alcohol use is associated with tremendous costs to the drinker, those around him or her, and society as a whole. These costs result from the increased health risks (both physical and mental) associated with alcohol consumption. To reduce alcohol's impact on the burden of disease it therefore is imperative to develop effective interventions that can prevent or delay initiation of drinking among those who do not drink, particularly adolescents, and limit consumption to low-risk drinking levels among those who do consume alcohol.

References:

Hussong, A. M., Ennett, S. T., Cox, M. J., & Haroon, M. (2017). A systematic review of the unique prospective association of negative affect symptoms and adolescent substance use controlling for externalizing symptoms. Psychology of Addictive Behaviors, 31(2), 137–147.

Marshall, E. J. (2014). Adolescent alcohol use: Risks and consequences. Alcohol and Alcoholism, 49(2), 160–164.

Bremner, P., Burnett, J., Nunney, F., Ravat, M., & Mistral, W. (2011). Young people, alcohol and influences. York: Joseph Rowntree Foundation.

Merline, A. C., O'Malley, P. M., Schulenberg, J. E., Bachman, J. G., & Johnston, L. D. (2004). Substance use among adults 35 years of age: Prevalence, adulthood predictors, and impact of adolescent substance use. American Journal of Public Health, 94(1), 96–102.

Squeglia, L. M., Jacobus, J., & Tapert, S. F. (2014). The effect of alcohol use on human adolescent brain structures and systems. Handbook of Clinical Neurology, 125, 501–510.

Colder, C. R., Scalco, M., Trucco, E. M., Read, J. P., Lengua, L. J., Wieczorek, W. F., & Hawk, L. W., Jr. (2013). Prospective associations of internalizing and externalizing problems and their co-occurrence with early adolescent substance use. Journal of Abnormal Child Psychology, 41(4), 667–677.

Parrish, K. H., Atherton, O. E., Quintana, A., Conger, R. D., & Robins, R. W. (2016). Reciprocal relations between internalizing symptoms and frequency of alcohol use: Findings from a longitudinal study of Mexican-origin youth. Psychology of Addictive Behaviors, 30(2), 203–208.

Corrao, G.; Bagnardi, V.; Zambon, A.; And LA Vecchia, C. A metanalysis of alcohol consumption and the risk of 15 diseases. Preventive Medicine 38(5):613–619, 2004.

Seitz, H.K., and Becker, P. Alcohol metabolism and cancer risk. Alcohol Research & Health 30(1):38–47, 2007.

Lachenmeier, D.W.; Kanteres, F.; And Rehm, J. Carcinogenicity of acetaldehyde in alcoholic beverages: Risk assessment outside ethanol metabolism. Addiction 104(4):533–550, 2009.

Baliunas, D.O.; Taylor, B.J.; Irving, H.; ET AL. Alcohol as a risk factor for type 2 diabetes: A systematic review and metaanalysis. Diabetes Care. 32(11):2123–2132, 2009.

Taylor, B.; Irving, H.M.; Kanteres, F.; ET AL. The more you drink, the harder you fall: A systematic review and metaanalysis of how acute alcohol consumption and injury or collision risk increase together. Drug and Alcohol Dependence. 110(1–2):108–116, 2010.

Neese, S., La Grange, L., Trujillo, E. and Romero D. (2004). The effects of ethanol and silymarintreatment during gestation on spatial working memory. Crowdy, KA, Marple-Horvat DE., Alcohol Clin Exp Res. Mar;28(3):402-7.

Corrao, G. (1999). Exploring the dose-response relationship between alcohol consumption and the risk of several alcohol-related conditions: a meta-analysis. Addiction, 94(10): 1551-1573.

Haberman, P.W., Weinbaum, D.F. (1990), Liver cirrhosis with and without mention of alcohol ascause of death. British Journal of Addiction, 85(2): 217-222.

Albano, (2002). Free radicals and alcohol-induced liver injury. Ethanol and liver, pp 53-190 [CDINSherman, VR Preedy and RR Watson, editors]. London: Taylor and Francis.

Koppes, L.L., Dekker, J.M., Hendriks, H.F., Bouter, L.M., Heine, R.J. (2005). Moderate alcohol consumption lowers the risk of type 2 diabetes: a meta-analysis of prospective observation all studies. Diabetes Care. 28: 719-25.

Lisa Gustafsson, (2007). Endogenous Opioids and Voluntary Ethanol Drinking. Consequences of Postnatal. Environmental Influences in Rats. Acta Universitatis Upsalienses. Digital comprehensive Summaries of Uppsala Dissertations from the Faculty of Pharmacy 51. 80 pp. Uppsala. ISBN 978-91-554-6843-9.

Liu, J., Yeo, HC., Overvik-Douki, E., et al. (2000). Chronically and acutely exercised rats: biomarkers of oxidative stress and endogenous antioxidants. J Appl Physiol; 89(1): 21-8.

Streissguth, A. (1997). Fetal Alcohol Syndrome: A Guide for Families and Communities. Baltimore: Brookes Publishing. ISBN 1-55766-283-5.

Guerri, C. (2002). Mechanisms involved in central nervous system dysfucntions induced by prenatal ethanol exposure. Neurotoxicity Research, 4(4), 327-335.

Samokhvalov, A.V. Irving, h.; Mohapatra, S; and Rehm, j. Alcohol consumption, unprovoked seizures and epilepsy: A systematic review and metaanalysis. Epilepsia 51(7):1177–1184, 2010a.

Kessler, R.C.; Crum, R.M.; Warner, L.A.; ET AL. Lifetime cooccurrence of DSMIIIR alcohol abuse and dependence with other psychiatric disorders in the National Comorbidity Survey. Archives of General Psychiatry 54(4):313–321, 1997.

Samokhvalov, A.V.; Irving, H.M.; AndRehm, J. Alcohol consumption as a risk factor for pneumonia: A systematic review and metaanalysis. Epidemiology and Infection 138(12):1789–1795, 2010c.

Effect of Drug Abuse on Development of Fetus and Newborns: A review

C. Narasimha Rao, U. Srineetha, D. Veera Nagendra Kumar

Department of Zoology, Government College for Men(A), Kadapa, A.P. -516004.

Abstract

Drug abuse among women is a global problem. Drug abuse can lead to various health issues, including addiction, organ damage, mental health disorders, and even overdose. The use of addictive substances during pregnancy can be risky for the health of the woman and her children in the short and long term. In 2021, 26.6 million women aged 18 years and older (20.4% of the population) reported illicit drug use.Direct effects occur because drugs can interact with the developing fetus. Additionally, drugs can also have indirect effects by impacting the mother's body. Abstinence Syndrome (NAS) refers to a group of withdrawal symptoms that newborns may experience after being exposed to addictive substances, such as opioids, during pregnancy. Exposure to alcohol during pregnancy leads to Fetal Alcohol Spectrum Disorder (FASD) can cause permanent damage to the developing fetus.These abnormalities disrupt normal developmental patterns and are linked to impairments in cognitive abilities, executive function, memory, visual and auditory processing, motor skills, behavioral regulation, and social adaptation.

Key words: Drug abuse, drug withdrawal symptoms, NAS, FASD, Development of fetus and newborn.

Introduction

Drug abuse refers to the excessive, recurrent, and illegal use of drugs. It involves abusing substances, such as illegal drugs or prescription drugs, in a way that can have serious negative consequences for an individual's physical and mental health, relationships, and overall well-being.Drug abuse can lead to various health issues, including addiction, organ damage, mental health disorders, and even overdose. It can also impact a person's personal and professional life, as it often contributes to impaired judgment, decreased productivity, financial problems, and legal issues.

The prevalence of drug abuse varies across regions and countries. Factors such as societal norms, economic conditions, availability of drugs, and cultural influences can contribute to the problem. International organizations like the United Nations Office on

Drugs and Crime (UNODC) and the World Health Organization (WHO) monitor and address the issue of drug abuse on a global scale. They work towards promoting prevention strategies, improving treatment options, and enhancing international cooperation to combat illicit drug trade.

Drug abuse among women is a global problem, albeit with regional and country differences. The use of addictive substances during pregnancy can be risky for the health of the woman and her children in the short and long term. The most frequently abused substances are tobacco and alcohol, as well as marijuana and cocaine.Research shows that the use of tobacco, alcohol or illegal drugs or the abuse of prescription drugs by pregnant women can have serious health consequences for infants. Many substances easily pass through the placenta, so substances taken by a pregnant woman also reach the fetus [1].Women make up more than 40 percent of people using pharmaceutical drugs for non-medical purposes and nearly one in two people using amphetamine-type stimulants (ATS), but only one in five in ATS treatment is female[2].In 2021, 26.6 million women aged 18 years and older (20.4% of the population) reported illicit drug use in the past 12 months [3].

The placenta allows drugs of abuse to readily pass through and impact fetal brain development. Consequently, in utero exposure to drugs can have enduring consequences for both the structure and function of the brain. These effects on the developing nervous system, occurring before homeostatic regulatory mechanisms are fully established, often diverge from their impact on fully developed systems [4].

Drug abuse during pregnancy can have detrimental effects on both the fetus and newborn.

1. Fetal exposure: When a pregnant woman abuses drugs, substances like nicotine, alcohol, marijuana, cocaine, heroin, or prescription drugs can cross the placental barrier and directly affect the developing fetus.

2. Premature birth: Substance abuse increases the risk of premature birth, which can lead to various health complications for the newborn.

3. Low birth weight: Drug abuse is associated with low birth weight in infants, which can lead to developmental delays, poor growth, and long-term health issues.

4. Neonatal abstinence syndrome (NAS): If a pregnant woman abuses opioids, the newborn may develop NAS. It occurs when the infant becomes dependent on the drug in the womb,

leading to withdrawal symptoms after birth. NAS requires medical intervention and specialized care.

5. Birth defects: Certain drugs, like alcohol and some prescription medications, can cause birth defects in babies. These defects may affect their physical, cognitive, and behavioral development.

6. Respiratory problems: Babies born to mothers who abused drugs may experience respiratory issues, such as respiratory distress syndrome, due to underdeveloped lungs.

7. Cognitive and behavioral issues: Drug exposure during pregnancy may contribute to cognitive and behavioral problems in children, including difficulties with learning, attention, memory, and social interaction.

Effects on the developing fetus and newborn

Certain drugs can have various effects on the development of a fetus. During the early stages of pregnancy, known as the embryonic stage, drugs can potentially cause significant birth defects. However, as the fetus progresses into the fetal period, after major structural development has taken place, the effects of drugs become more subtle. These effects may include abnormal growth or maturation, changes in neurotransmitters and their receptors, and alterations in brain organization.

These direct effects occur because drugs can interact with the developing fetus. Additionally, drugs can also have indirect effects by impacting the mother's body. For example, nicotine affects specific receptors in the mesolimbic pathway, while alcohol activates certain neural pathways that involve inhibitory γ-aminobutyric acid (GABA) receptors and reduce activity in glutamate receptors. Drugs of abuse can mimic naturally occurring neurotransmitters, such as marijuana acting as anandamides, opiates acting as endorphins, and cocaine/stimulants affecting dopamine and serotonin levels in the mesolimbic dopaminergic pathways [5].

Abstinence Syndrome (NAS) refers to a group of withdrawal symptoms that newborns may experience after being exposed to addictive substances, such as opioids, during pregnancy. When a pregnant individual consumes substances like heroin, prescription painkillers, or certain medications, the fetus becomes dependent on these substances as well. After birth, when the drug supply is abruptly stopped, the infant may undergo withdrawal, leading to various physiological and neurological symptoms. Some common symptoms

include tremors, excessive crying, poor feeding, sleep disturbances, irritability, and seizures. Treatment for NAS typically involves minimizing environmental stimuli, providing proper nutrition and hydration, and administering medications to manage withdrawal symptoms. It is crucial for healthcare professionals to monitor and care for infants with NAS to ensure their well-being and support their recovery [6&7].

Exposure to alcohol during pregnancy leads to Fetal Alcohol Spectrum Disorder (FASD) can cause permanent damage to the developing fetus.Individuals diagnosed with fetal alcohol spectrum disorder (FASD) exhibit neuroimaging findings indicating atypical brain structure, cortical development, white matter microstructure, and altered functional connectivity. These abnormalities disrupt normal developmental patterns and are linked to impairments in cognitive abilities, executive function, memory, visual and auditory processing, motor skills, behavioral regulation, and social adaptation [8,9&10].It is important to note that FASD is entirely preventable by avoiding alcohol consumption during pregnancy

Conclusion

After reviewing the effects of drug abuse on the development of fetuses and newborns, we can conclude that drug abuse during pregnancy can have significant detrimental effects on both the fetus and the newborn. The use of drugs such as alcohol, tobacco, opioids, cocaine, and marijuana have been linked to various negative outcomes.Drugs can cross the placenta, exposing the developing fetus to harmful substances, resulting in an increased risk of preterm birth, low birth weight, miscarriage, birth defects, and developmental delays. Additionally, drug abuse during pregnancy can lead to neonatal abstinence syndrome, where the newborn experiences withdrawal symptoms after birth.

Furthermore, drug use during pregnancy can have long-term effects on the child's cognitive, behavioral, and emotional development. It may contribute to learning disabilities, behavioral problems, poor motor skills, and increased susceptibility to substance abuse later in life.It is essential for expectant mothers to understand the significant risks of drug abuse and seek support and treatment as early as possible. Healthcare providers should provide comprehensive prenatal care and education to prevent and address drug abuse, ensuring the well-being and healthy development of both the fetus and the newborn.

References

1. Jones HE, Fielder A. Neonatal abstinence syndrome: Historical perspective, current focus, future directions. *Prev Med.* 2015; 80:12-17. Doi: 10.1016/j.ypmed.2015.07.017
2. World drug report, 2022. WDR22_Booklet_1.pdf (unodc.org)
3. Women and drugs, Substance Use in Women DrugFacts | National Institute on Drug Abuse (NIDA) (nih.gov)
4. Ross EJ, Graham DL, Money KM, Stanwood GD. Developmental consequences of fetal exposure to drugs: what we know and what we still must learn. Neuropsychopharmacology. 2015 Jan;40(1):61-87. doi: 10.1038/npp.2014.147. Epub 2014 Jun 18. PMID: 24938210; PMCID: PMC4262892.
5. Marylou Behnke, Vincent C. Smith, COMMITTEE ON SUBSTANCE ABUSE, COMMITTEE ON FETUS AND NEWBORN, Marylou Behnke, Vincent C. Smith, Sharon Levy, Seth D. Ammerman, Pamela Kathern Gonzalez, Sheryl Ann Ryan, Vincent C. Smith, MD Martha J. Wunsch, Lu-Ann Papile, Jill E. Baley, Waldemar A. Carlo, James J. Cummings, Praveen Kumar, Richard A. Polin, Rosemarie C. Tan, Kristi L. Watterberg; Prenatal Substance Abuse: Short- and Long-term Effects on the Exposed Fetus. *Pediatrics* March 2013; 131 (3): e1009–e1024. 10.1542/peds.2012-3931
6. Anbalagan S, Mendez MD. Neonatal Abstinence Syndrome. 2023 Apr 29. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan–. PMID: 31855342.
7. Sanlorenzo LA, Stark AR, Patrick SW. Neonatal abstinence syndrome: an update. Curr Opin Pediatr. 2018 Apr;30(2):182-186. doi: 10.1097/MOP.0000000000000589. PMID: 29346142; PMCID: PMC5843557.
8. Fetal Alcohol Syndrome and Fetal Alcohol Spectrum Disorders,*Am Fam Physician.* 2017;96(8):515-522A, Fetal Alcohol Syndrome and Fetal Alcohol Spectrum Disorders | AAFP
9. Wozniak JR, Riley EP, Charness ME. Clinical presentation, diagnosis, and management of fetal alcohol spectrum disorder. Lancet Neurol. 2019 Aug;18(8):760-770. doi: 10.1016/S1474-4422(19)30150-4. Epub 2019 May 31. PMID: 31160204; PMCID: PMC6995665.

10. Wilhoit LF, Scott DA, Simecka BA. Fetal Alcohol Spectrum Disorders: Characteristics, Complications, and Treatment. Community Ment Health J. 2017 Aug;53(6):711-718. doi: 10.1007/s10597-017-0104-0. Epub 2017 Feb 6. PMID: 28168434.

Protective Effects of Medicinal Plants against Neurotoxicity: A Review

D. Veera Nagendra Kumar, C. Narasimha Rao, U. Srineetha

Department of Zoology, Government College for Men (A), Kadapa, Andhra Pradesh-516004

Abstract:

Neuroprotection is the protection of the structure and function of neurons from insults from cellular injuries caused by a variety of agents or neurodegenerative diseases. Natural products play an essential role in prevention and therapy of various neurodegenerative diseases, and neuronal dysfunctions. Ethnopharmacological studies have provided information to identify potential new drugs from plant sources. Recently many drugs which available in medicine were originally isolated from plants or their constituents Anti-inflammatory and antioxidant activities of plants and isolated components form plants were used in improvement neuro-inflammation, anxiety, convulsion and etc. The current review will highlight the neuroprotective effects of medicinal plants.

Key words: Neuroprotective, medicinal pants, neurotoxicity, neurodegenerative diseases

Introduction:

Neurodegeneration has been identified as the pivotal pathophysiological change in most brain-related disorders [1]. Nowadays, these diseases, which are associated with different multifactorial etiologies, have created massive medical, social, and financial problems [2] .The neurodegenerative diseases are including Alzheimer's Disease (AD), Parkinson's disease (PD), Multiple Sclerosis (MS) and etc. I Pathologic processes including inflammation, oxidative stress, apoptosis, mitochondrial dysfunction, and genetic factors lead to neuronal degeneration in PD [3]. Neurons are central to the proper functioning of the human brain since they play a critical role in communication [4]. Most neurons originate in the brain; however, neurons are present everywhere in the body [5].There are different antioxidants in the brain, like superoxide dismutase (SOD) as enzymatic antioxidant and thiol containing molecules such as glutathione (GSH) as non-enzymatic antioxidant.CNS which contains high level of polyunsaturated fatty acids is more sensitive to peroxidation reactions. Medicinal plants possess neuroprotective effects via mechanisms that include inhibiting protein-based deposit accumulation, oxidative stress, and neuroinflammation, and correcting defects of neurotransmitters such as acetylcholine and dopamine [7]. In herbal medicine,

plant organs including: leaves, stems, roots, flowers, fruits and seeds were used as alternative and complementary therapy. In the present review study, it was aimed to highlight the useful effects of different plants on different induced methods for neurotoxicity.

Neuroprotective medicinal plants:

Calendula officinalis

The neuroprotective effect of Calendula officinalis Linn. flower extract (COE) on Monosodium glutamate (MSG)-induced neurotoxicity was evaluated in rats. Adult Wistar rats were administered systemically for 7 days with MSG and after 1h of MSG injection, rats were treated with COE (100 and 200 mg/kg) orally. At the end the treatment period, animals were assessed for locomotor activity and were sacrificed; brains were isolated for estimation of LPO, GSH, CAT, TT, GST, Nitrite and for histopathological studies. MSG caused a significant alteration in animal behavior, oxidative defense (raised levels of LPO, nitrite concentration, depletion of antioxidant levels) and hippocampal neuronal histology [8].

Cassia occidentalis

The antianxiety and antidepressant activity of the ethanolic and aqueous extracts of Cassia occidentalis leaves (500 mg/kg, orally) was evaluated in rodents. Antianxiety activity was tested by exposing rats to unfamiliar aversion in different methods like elevated plus maze model and actophotometer. In elevated plus-maze test, the ethanolic and aqueous extracts of Cassia occidentalis leaves at a dose of 500 mg/kg orally, significantly increased the number of entries and time spent into the open arm. The magnitude of the antianxiety effects 500 mg/kg orally, of ethanolic and aqueous extracts of Cassia occidentalis was comparable to that of diazepam 5 mg/kg ip. The average of basal activity scores after 30 and 60 min of administration of ethanolic and aqueous extracts of Cassia occidentalis leaves 500 mg/kg orally, showed significant reduction of the locomotor activity. The antidepressant activity was tested by using despair swim test and tail suspension test. In despair swim test apparatus, the ethanolic and aqueous extracts of leaves of Cassia occidentalis at a dose of 500 mg/kg orally, significantly decreased the immobility time. The magnitude of the antidepressant effects of 500 mg/kg orally, of ethanolic and aqueous extracts of leaves of Cassia occidentalis was comparable to that of fluoxetine 10 mg/kg ip. In tail suspension test, the ethanolic and aqueous extracts of leaves of Cassia occidentalis at a dose of 500 mg/kg orally, significantly decreased the immobility time. The magnitude of the antidepressant

effects of 500 mg/kg orally, of ethanolic and aqueous leaves of Cassia occidentalis was comparable to that of fluoxetine 10 mg/kg ip. Ethanolic extract of Cassia occidentalis leaves showing more significant antidepressant activity over the aqueous extract [9].

Lavandula angustifolia

Researches indicate that Lavandula angustifolia can put down and glutamate-induced neurotoxicity via inhibition cholinesterase [10]. It has been reported that Lavandula angustifolia extract is benefit for cognitive dysfunction [11].

Aerva lanata

High levels of flavonoids and phenolic compounds maybe are responsible of Aerva lanata antioxidant activity [50]. It has been reported that Aerva lanata improved behavioral functions [51]. Histological studies on brain showed that administration of A. lanata might have a protective effect against cisplatin-induced animals [12] .

Myrtus communis

The neuroprotective effect of myrtle was studied against lipopolysaccharides (LPS) induced neurotoxicity in rat. Nitric oxide, malondialdehyde, interleukine-1β, tumour necrosis factor α, estrogen, 5LOX, 15LOX, lipoxin A4, asymmetric dimethyl arginine (ADMA) and Willebrand factor (VWF) were determined in serum and brain tissue of challenged rats. The results revealed significant increase in the investigated stress parameters associated with significant decrease in the estrogen level in LPS-intoxicated rats. Marked amelioration was detected in all the studied biomarkers [13].

Polygala paniculata

Most species of Polygala genus possesses significant protective effects against neuronal death and cognitive impairments by reduction of Ca2+, Na+ and enhancement of K+ level or ‘antiglutamatergic’ effect in neurodegenerative disorders related to excitotoxicity [64]. Bettio reported that some hydroethanolic extract constitutes of Polygala paniculata may have considered as ligand for some receptors like 5- HT2A, α2, β and D2 [14].

Lithospermum officinale

Shikonin exhibited a neuroprotective effect against the damage caused by ischemia/reperfusion in mice, it decreased the neurological deficit scores, infarct size, and

levels of malondialdehyde, carbonyl, and reactive oxygen species. The neuroprotective effect of shikonin could be mediated by its antioxidant effects. The neuroprotective activity of shikonin and its derivatives was also been described in microglial cells which were the prime effectors in immune and inflammatory responses of the central nervous. Two of shikonins derivatives (isobutyryl- and isovalerylshikonin) were more effective than shikonin in repressing microglial LPS-induced activation. Shikonin also protected dopaminergic neurons against 6-hydroxydopamineinduced neurotoxicity [15-16].

Ocimum basilicum

The neuroprotective effect of Ocimum basilicum leaf extract (200 and 400 mg/kg, orally, once daily for 7 days) was studied following cerebral injury induced by bilateral common carotid artery occlusion followed by reperfusion in mice. Cognitive outcomes and sensorimotor disturbances were evaluated with Morris Water Maze, Elevated Plus Maze and neurological severity score, respectively. Treatment with the extract resulted in marked improvement in memory and motor coordination. The extract also decreased cerebral infarct size and oxidative stress in mice. The extract contained high total phenol content, and possessed strong antioxidant effects [17].

Nerium oleander

PBI-05204, a supercritical CO2 extract of Nerium oleander, exerted significant neuroprotection to neural tissues damaged by oxygen and glucose deprivation occurred in ischemic stroke. The neuroprotective activity of PBI-05204 was maintained for several hours after oxygen and glucose deprivation treatment. The neuroprotective activity of PBI05204 was mediated through oleandrin and/or other glycoside constituents. Accordingly, the authors suggested a clinical potential for PBI-05204 in the treatment of ischemic stroke and prevention of associated neuronal death [18].

Oxalis corniculate

The neuroprotective effect of alcoholic extract of Oxalis corniculata, was evaluated via the analysis of behavioral features in MPTP (1-methyl,4- phenyl-1,2,3,6-tetra hydro pyridine) induced Parkinsonic mouse. Behavioral studies were performed by the astrophotometer, elevated plus maze, rota rod, hole board, step down and step through tests. Treatment with Oxalis corniculata reversed the alterations in locomotor and muscle coordination in MPTP induced Parkinsonic mouse. Different doses of Oxalis corniculata

increased memory retention and retrieval significantly. The authors concluded that the memory retention and retrieval enhancement of Oxalis corniculata extract could be attributed to the presence of antioxidants such as flavonoids, coumarins, tocopherols and phenolic acids [19].

Coriandrum sativum

The neuroprotective effect of Coriandrum sativum was evaluated against ischemic-reperfusion insult in brain. The global cerebral ischemia in albino rats was induced by blocking common carotid arteries for 30 mins followed by 45 mins of reperfusion. At the end of reperfusion period, histological changes, levels of lipid peroxidation, superoxide dismutase, catalase, glutathion, calcium and total protein were measured. Bilateral common carotid artery occlusion produced significant elevation in lipid peroxidation, calcium levels and infarct size, and decrease in endogenous antioxidants such as reduced glutathion, superoxide dismutase and catalase levels. Pretreatment with methanolic extract of leaves of Coriandrum sativum (200 mg/kg, po) for 15 days increased endogenous enzyme levels of superoxide dismutase, glutathion, catalase and total protein levels, and reduces cerebral infarct size, lipid peroxidation and calcium levels. It also attenuated reactive changes in brain histology like gliosis, lymphocytic infilteration and cellular edema. Accordingly, Coriandrum sativum possessed protective effect in ischemic-reperfusion injury and cerebrovascular insufficiency states [20].

Conclusion:

Plants and their constituents play their protective roles via increased SOD and catalase levels, restoration of GSH, decreased MDA levels and also protects of neurons against ROS as antioxidant activities. Anti-inflammatory properties of plants and their constituents as well as due to their interactions with pro-inflammatory cytokines such as IL-6, IL-1β, and TNF-α and mediated by overexpression of BCl-2 which is inducible nitric oxide synthase (iNOS). The management of neurodegenerative diseases remains a challenge in the modern medicine because of their complicated pathogenesis. Many medicinal plants possessed neuroprotective effect by many mechanisms. The current review discussed the medicinal plants with neuroprotective effect.

References:

1. Merelli A., Czornyj L., Lazarowski A. Erythropoietin: A neuroprotective agent in cerebral hypoxia, neurodegeneration, and epilepsy. Curr. Pharm. Des. 2013;19:6791–6801.doi:
2. Saxena S, Caroni P. Selective neuronal vulnerability in neurodegenerative diseases: from stressor thresholds to degeneration. Neuron. 2011;71:35-48.
3. Fu W, Zhuang W, Zhou S, Wang X. Plantderived neuroprotective agents in Parkinson's disease. Am J Trans Res. 2015;7:1189.
4. Van den Heuvel M.P., Sporns O. Network hubs in the human brain. Trends Cogn. Sci. 2013;17:683–696.
5. Pino A., Fumagalli G., Bifari F., Decimo I. New neurons in adult brain: Distribution, molecular mechanisms and therapies. Biochem. Pharmacol. 2017;141:4–22.
6. Floyd RA, Carney JM. Free radical damage to protein and DNA: mechanisms involved and relevant observations on brain undergoing oxidative stress. Annals of Neurology. 1992; 32: S22- S27.
7. Al-Snafi AE,Talab TA, Majid WJ. Medicinal plants with central nervous activity - An overview (Part 1). IOSR Journal of pharmacy. 2019; 9(3): 52-102.
8. Shivasharan BD, Nagakannan P, Thippeswamy BS, Veerapur VP. Protective effect of Calendula officinalis L. flowers against monosodium glutamate induced oxidative stress and excitotoxic brain damage in rats. Indian J Clin Biochem. 2013; 28(3): 292-298.
9. Shafeen S, Srinath RT, Arafath S, Nagarjuna S, Padmanabha RY. Evaluation of antianxiety and antidepressant activity of Cassia occidentalis leaves. Asian J Pharm Clin Res. 2012; 5(3): 47-50.
10. Muruganandam A, Ghosal S, Bhattacharya S. The role of xanthones in the antidepressant activity of Hypericum perforatum involving dopaminergic and serotonergic systems. Biogenic Amines. 1999;15:553.
11. Adsersen A, Gauguin B, Gudiksen L, Jäger AK. Screening of plants used in Danish folk medicine to treat memory dysfunction for acetylcholinesterase inhibitory activity. Journal of ethnopharmacology. 2006;104:418-422.
12. Rao MA, Palaksha MN, Sirisha KN, Bhargavi VL, Manikandhar P. Effect of Aerva lanata on cisplatin induced Neurotoxicity in rats. World Journal of Pharmacy and Pharmaceutical Sciences. 2014;3:2431-2451.

13. Youness ER, Mohamed NA, Ashour MN, Aly HF, Ibrahim AMM. Neuroprotective effect of Myrtus communis and Zingbar officinale in LPS induced neurotoxicity in brain rats' model. Der Pharma Chemica. 2016; 8(19): 474-482.
14. Swamy AV, Patel NL, Gadad PC, Koti BC, Patel UM, Thippeswamy AHM, et al. Neuroprotective activity of pongamia pinnata in monosodium glutamate-induced neurotoxicity in rats. Indian journal of pharmaceutical sciences. 2013;75:657.
15. Nam KN, Son MS, Park JH, Lee EH. Shikonins attenuate microglial inflammatory responses by inhibition of ERK, Akt, and NF-κB: neuroprotective implications. Neuropharmacology. 2008; 55: 819-825.
16. Al-Snafi AE. Chemical constituents and pharmacological effects of Lithospermum officinale. IOSR Journal ofPharmacy. 2019; 9(8): 12-21.
17. Singh V, Krishan P, Shri R. Improvement of memory and neurological deficit with Ocimum basilicum L. extract after ischemia reperfusion induced cerebral injury in mice. Metab Brain Dis. 2018; 33(4): 1111-1120.
18. Al-Snafi AE.Bioactive ingredients and pharmacological effects of Nerium oleander. IOSR Journal of Pharmacy. 2020; 10(9): 19-32.
19. Aruna K, Rajeswari PDR, Sankar SR. The effect of Oxalis corniculata extract against the behavioral changes induced by 1- methyl- 4-phenyl-1,2,3,6-tetrahydro pyridine (MPTP) in mice. Journal of Applied Pharmaceutical Science. 2017; 7(03): 148-153.
20. Vekaria RH, Patel MN, Bhalodiya PN, Patel V, Desai TR, Tirgar PR. Evaluation of neuroprotective effect ofCoriandrum sativum Linn. against ischemic - reperfusion insult in brain. International Journal of Phytopharmacology. 2012; 3(2): 186-193.

TOXIC SUBSTANCES & THEIR EFFECTS ON FISHE HEALTH

U.Srineetha[1] and P.Sachi Devi

Lecturer in zoology,[1]Govt.College for men(A),and [2]SKR and SKR Women College(A),Kadapa

Abstract

Rapid industrialization results in the production of huge amounts of solid and/or liquid wastes, which is usually discharged into the nearby water bodies, leading to the damage of the important ecosystems and seafood products. Like humans and other species of animals, fish have also been found to be polluted with a large number of heavy metals, chemicals, drugs, infections or pollutants/contaminants. Many aquaculture chemicals are by their nature biocidal when released to the surrounding environment at toxic concentration Therefore, the present overview aims to highlight the issue of pollution of aquatic ecosystems and fish health. Heavy metals are widely used in every industrial application; therefore, they form the core group of pollutants of any industrial discharge. Some of the heavy metals such as Fe, Mn, Co, Ni, Cu, Zn and Cr are essential as they form the cofactor for many of the enzymes and also needed in metabolic activities. On the contrary, their exceeding amount is also detrimental to both animals and human beings. Based on the current review, it has been observed that to monitor the health of indicator organism (fish), battery of bioassays or biomarkers are required. In addition to this rationale of using the few selected parameters such as condition indices, bioaccumulation, blood biochemistry, marker enzymes of tissue damage, oxidative stress, , hemato-biochemical parameters and histopathology in describing, the aquatic pollution has also been emphasized. All these parameters are significantly affected by heavy metals and hence proved as useful tools in biomonitoring or toxicity assessment studies. Since fishes are consumed by large mass of population due to their high protein and polyunsaturated fatty acid content, human health is also under danger. These compounds are quickly degraded or precipitated; they are not bioaccumulative and do not cause environmental perturbations in natural water receiving pond effluents. Most substances used in pond aquaculture to improve soil or water quality presented little or no risk to food safety. They may be biomagnified in the animal tissue and so consumers are at risk of intoxication with the chemicals.

Keywords: Heavy metals Bioaccumulation Oxidative stress , hemato-biochemical parameters of fish, histopathology

Introduction

Like humans and other species of animals, fish have also been found to be polluted with a large number of heavy metals, chemicals, drugs, infections or pollutants/contaminants. Many aquaculture chemicals are by their nature biocidal when released to the surrounding environment at toxic concentration. Thus, there is a potential for mortality of non-target organisms[1]. Three classes of aquaculture chemicals and their effects on non-target biota are carbaryl pesticide mortality of non-target invertebrates, organophosphate parasiticide- effects on nearby biota and antibacterial residues-effects in aquatic sediments on the associated microbial community (Weston, 1996

Water is essential for all forms of life. Seas and oceans contribute approximately 97%, while the freshwater resources consist only 3% of the entire water reserve of the earth. About 68.7% of the freshwater is locked up in glaciers and ice caps on poles, 30.1% in groundwater, 0.3% in surface water bodies and 0.9% in other forms [1]. So the amount of freshwater on Earth is limited, but its quality is always under suspect as reported by Global Analysis and Assessment of Sanitation[2]. Now, water has a key role in sustaining ecological balance. Moreover, it is not only the main component of the biosphere but also a major part of the living organisms [2]. Life cannot be sustained more than few days without water, while an inadequate supply of water may change the pattern of distribution of organisms as well as of human beings. The widespread scarcity, the gradual destruction and the aggravated pollution of the water resources also lead to degradation of ecosystem. Nowadays, water quality issues are gaining recognition as river waters are getting heavily polluted at many places.

Pesticides, disinfectants, antibiotics, chemotherapeutic agents and anesthetics are highly toxic. Use of large quantities of antibiotics in aquaculture has the potential to be detrimental to fish health, to the environment, wildlife and to human health. Copper and zinc have been measured in sediments near aquaculture sites at high concentrations[3]. These elements could be lethal to aquatic biota and persist in sediments. Copper-based antifouling paints are applied to 4 cages and nets to prevent the growth of attached marine organisms on them. The buildup of these organisms (‘epibiota’) would reduce the water flow through the cages and decrease dissolved oxygen[4].pointed out that the serious threats to aquaculture water come from herbicides used to control aquatic vegetation in fish ponds, runoff of pesticides, herbicides and fertilizers from fields adjoining aquaculture ponds; and aquifer contamination due to pollution of the recharge water.

Factors influencing toxicity:

1. Composition of the toxic agent

2. Dose and Concentration:

(a) Exposure medium, (b) Length of exposure, (c) Time of exposure and (d) Route of exposure

3. Metabolism of toxicant,

4. Gender, and 5.Age

Major Toxicants and effects of their exposure in fishes - Heavy Metals & Pesticides :

1. Heavy metals: Heavy metals are defined as metallic elements that have a relatively high density• compared to water e.g., arsenic, lead, mercury, cadmium, chromium and some 'trace elements' like copper, selenium and zinc. They play an important role in maintaining the body metabolism. But if present in• quantity more than required by the body, heavy metals can prove to be damaging. Urbanization and industrialization have increased dumping of heavy metals into the• environment As fish is in direct contact with water, they are therefore used as biomonitors to assess the• bioaccumulation and biomagnification of contaminants within the water system and tell us the health of other aquatic animals.

Mode of actions of heavy metals in living tissues

Heavy metals have the atomic density greater than 4 g/cm^3 and have the chemical properties to attract and accept electrons, which cause toxicity to aquatic organisms[5]. Heavy metals can persist in the environment for so long resulting a continuous exposure of fish to the heavy metals. The accumulation process of heavy metals and their mode of action in fish depend on the type of heavy metals, fish species, duration of exposure etc. Bioaccumulation and biomagnification are

Lethal concentrations of heavy metals for fish

Heavy metals when crossed the tolerance limits are proved to be a potential threat to organisms due to high toxicity and tissue damage within the body. Toxicity tests are performed in a dose-dependent manner to investigate the effects of heavy metals in the physiology of aquatic organisms, which in further help determining the discharge limit of the chemicals to the natural environment[5]. Determining the lethal concentration is a widely used assay to detect the level of

Heavy metals effect on hemato-biochemical parameters of fish

Fish blood is an important diagnostic tool to detect any stressful or pathological condition in any place within the body to various biotic and abiotic stresses. The exposure of fishes to heavy metal is manifested by numerous changes in hematological and biochemical parameters[7,8]. How heavy metal

Heavy metals effect on histopathology of different organs of fish

Major fish organs like gills, liver and kidney are very sensitive to heavy metal toxicants and are extensively studied for different fish species exposed to different heavy metals. These organs respond differently to various heavy metals and are considered to be an important bio-monitoring tool in evaluating their toxic effects in various fish species[6]. Prolonged exposure of heavy metals induces cytotoxicity and causes degenerative changes in the vital organs of the fish[9].

Molecular responses in fish to heavy metals exposure

Changing the expression profile of different genes involved in oxidative stress response and the detoxification of heavy metals in fishes are being used to reveal the cellular and physiological responses of different heavy metal exposure and considered as potential biomarkers to detect hazardous chemicals in the environment. The standard qPCR analysis, microarray and the most recent genomics technology such as transcriptomics, RNAseq have been used to study genome-wide and simultaneous[10]

Conclusions

In spite of the fact that CPs have been classified as a major group of pollutants, and the limitations on their use and their production in many countries, CPs are still introduced into the environment. CPs are resistant to biodegradation and therefore persistent in the environment. Because of their lipophilicity, these chemical compounds can be transported through the cell membrane and therefore bio-accumulate in algae, plants, and fish, leading to various adverse effects. Anthropogenic inputs and industries are the major sources of heavy metal contamination in the aquatic environments. Establishing industries are essential for country's development and when their effluents are discharged directly into the environment without proper wastewater treatment cause deleterious effects in the aquatic biota. Fish is an important and chief source of animal protein and are in direct contact with heavy metals due to aquatic pollution. Unfortunately, nowadays fish are

References

1.Boyd, C.E and Massaut, L. (1999). Risks associated with the use of chemicals in pond aquaculture. Aqua. Engine., 20(2): 113-132.

2.DMTA (2009). Methods for disinfection of aquaculture establishments. In: Manual of Diagnostic Tests for Aquatic Animals, Chapter, 1; pp. 1-3

3.Eyckmans M, Celis N, Horemans N, Blust R, De Boeck G. Exposure to waterborne copper reveals differences in oxidative stress response in three freshwater fish species. Aquat Toxicol. 2011;103(1–2):112–20.

4.Gautam PK, Gautam RK, Banerjee S, Chattopadhyaya MC, Pandey JD. Heavy metals in the environment: Fate, transport, toxicity and remediation technologies. In: Heavy Metals: Sources, Toxicity and Remediation Techniques. 2016;pp.101-130.

5.Javed, M., and Usmani, N. (2012). Toxic effects of heavy metals (Cu, Ni, Fe Co, Mn, Cr, Zn) to the haematology of *Mastacembelus armatus* thriving in Harduaganj Reservoir, Aligarh, India. *Glob. J. Med. Res.* 12, 59–64.

Google Scholar

6.Naz, S., Hussain, R., Ullah, Q., Chatha, A. M. M., Shaheen, A., and Khan, R. U. (2021). Toxic effect of some heavy metals on hematology and histopathology of major carp (*Catla catla*). *Environ. Sci. Pollut. Res.* 28, 6533–6539. doi:10.1007/s11356-020-10980-0

CrossRef Full Text | Google Scholar

7.Shah, S. L., and Altindag, A. (2004). Hematological parameters of Tench (*Tinca tinca* L.) after acute and chronic exposure to lethal and sublethal mercury treatments. *Bull. Environ. Contam. Toxicol.* 73, 911–918. doi:10.1007/s00128-004-0513-y

PubMed Abstract | CrossRef Full Text | Google Scholar

8.Shah, S. L. (2006). Hematological parameters in tench *Tinca tinca* after short term exposure to lead. *J. Appl. Toxicol.* 26, 223–228. doi:10.1002/jat.1129

PubMed Abstract | CrossRef Full Text | Google Scholar

9.Vinodhini, R. and Narayanan, M. (2008). Bioaccumulation of heavy metals in organs of fresh water fish Cyprinus carpio (Common carp). Int. J. Environ. Sci. Tech., 5(2): 179-182.

10.Wang WC, Mao H, Ma DD, Yang WX. Characteristics, functions, and applications of metallothionein in aquatic vertebrates. Front. Mar. Sci. 2014;1: 34

NATIONAL SEMINAR ON DRUG ADDICTION AND ABUSE AMONG YOUTH

Increasing incidence of addiction to Alcohol, Drugs & Tobacco in Youth with special reference to their Vulnerability

[1]G.L.N.Prasad [2]Smt.B.Nagajyothirmai [3]Dr.B.Sreedevi[4]Dr.P.Sachi Devi

[1&3]Lecturers in Zoology, Govt.Degree College, Kalyandurg

[2]Lecturer in Zoology, Govt.Degree College, Uravakonda

[4]Lecturer in Zoology, SKR&SKR Govt College for Women (A) Kadapa

Addiction is scientifically defined as behavioral disorder characterized by dependence of a victim on a substance. Normally substances like tobacco, drugs and alcohol have addiction potential. Youth are generally susceptible to this sort of addiction that is usually chronic and relapsing in nature. Daily dose of caffeine also has its addictive effect on the psyche of the consumer. Addictive behavior is characterized by mood swings, withdrawal symptoms and multiple personality disorder. Many addicts may suffer from bipolar personality disorder. Alter ego of the addicts and victims may trouble their social relations. Addicts exhibit a compulsive behavior in a sense that they cannot refrain themselves from taking that substance to which he or she is addicted. Victim has unusual craving for the substance and the denial of access to the substance may trigger withdrawal symptoms in the victim. Control over his own self is lost and this may give way to the behavioral abnormality. Thus substance addiction leads to behavioral addiction and this in turn leads to impulsive addiction. Griffith worked out effectively on the various components of this addictive behavior. Addiction at no point of time is positive and productive. Addiction is a complex behavioral pattern.

Indian youth are much addicted to Drugs, alcohol and nicotine. Influence of movies and changing life style may be one of the reasons for this addiction. Concrete reasons for increased incidence of substance abuse by Indian youth are listed below.

- Strained family relations
- Influence of social media
- Peer group pressure
- Increased accessibility

- Emotional imbalance
- Lack of parental guidance due to prevalence of nuclear families
- Professional pressure
- Failure to manage the stress
- Escapist tendency
- Family history of abuse
- Religion and traditions

Nicotine abuse:

This is normally taken in the form of cigarette. There is one funny definition of cigarette. "A cigarette is a pinch of tobacco rolled in white paper which has fire at one end and fool at another end" . In urban areas, it is found out that students get addicted to nicotine at school age itself due to its easy access. Cigarettes are available in the public market and purchasing them is not a taboo yet. Normally the nicotine addicts ignore the statutory warning "smoking is injurious to health" on nicotine products. Gutka chewing is another form of nicotine abuse. Truck drivers normally become victims to this gutka chewing. It is said that nicotine triggers the glucose production in the liver and this triggers the creative ideas in the persons who use it. It is quite hypothetical and there is no research evidence in support of such statements. Instead, nicotine abuse causes oral and lung cancers. FCV tobacco and hookah tobacco are available in India. Nicotine or tobacco in any form is unsafe and causes health hazards that are irreversible. FCV stands for 'flue cured Virginia' tobacco. This is produced by curing the leaves with heat. In Guntur markets Harvel De Bouxo Rio Grande tobacco is available. This tobacco intake is negatively affecting the youth. This results in brain anomalies. It also causes breathing problems in athletes reducing their performance in the playground. Chronic Obstructive Pulmonary Disease is directly linked to tobacco usage.

Alcohol is a fermented beverage that is often consumed by many people. In Western countries, its consumption is common as a part of daily menu in order to generate heat within the body in order to cope up with cold climate. Ethyl alcohol is used for human consumption. Methyl alcohol causes optic nerve damage when consumed. Ethyl alcohol, when it reaches cerebellum, results in the loss of equilibrium. Ethyl alcohol is broken down by liver that acts as a check post and as a result in alcoholics liver gets severely damaged. Symptoms of alcoholism are listed below.

- Loss of equilibrium

- Loss of judgement
- Speech related anomalies
- Stammering
- Liver cirrhosis
- Delayed responses
- Cancers

For treating severe alcoholics, deaddiction centers and rehabilitation centers are now available the World over.

Nausea and vomiting occurs in alcoholics due to accumulation of acetaldehyde in the blood.

Drugs like Bhang are normally consumed during religious fests as a part of rituals. Drugs belong to the following categories.

Opioids are extracted from *Papaver somniferum*. Morphine and heroin belong to the category of opioids. Heroin is diacetyl morphine. Morphine can be used as an effective pain killer. Normally excessive use of opioids may bring the following behavioral changes in the addicts.

- They become introverts
- Indifferent attitude
- Severe depression
- Mood swings
- Unusual sleep rhythms
- Anti-social attitude

Cannabinoids are extracted from *Cannabis sativa.*It is used in doping. It causes euphoria in the addicts.

Cocaine is extracted from the *Erythroxylum coca*. It often interferes with dopamine transport.

Adolescence is the vulnerable period to this drug abuse.

De-addiction strategy:

This involves a cooperative and sustained effort from the family and the victim. Professional help from the psychiatrist is to be sought. Peer pressure should be avoided. Triggers should be avoided. Support system should be developed. Aversion therapy may be the remedy.

Drug addicts may suffer from physical and mental ailments. Their relationships may be strained. They may be the cause of accidents. Suicidal tendencies may become dominant. Cognitive Behavior Therapy offers promising solution to the victims.

Above all, addicts get trapped in legal issues and all these factors tax them physically, socially, emotionally and economically.

Keywords: Addiction, De-addiction, withdrawal symptoms, Cognitive behavior therapy

References:

https://www.mayoclinic.org/diseases-conditions/drug-addiction/symptoms-causes/syc-20365112

https://medlineplus.gov/druguseandaddiction.html

Alcohol: Effect on Brain Functions

U.Srineetha,D.Veera Nagendra Kumar,C.Narasimha Rao

Assistant professor in zoology, Govt. College for men (A),Kadapa,A.P

Abstract

Over the past 40 years, rigorous examination of brain function, structure, and attending factors through multidisciplinary research has helped identify the substrates of alcohol-related damage in the brain,excessive and chronic alcohol consumption results in damage of brain structure and function. One main area of this research has focused on the neuropsychological sequelae of alcoholism, which has resulted in the description of a pattern of sparing and impairment that provided an essential understanding of the functional deficits as well as of spared capabilities that could be useful in recovery.Alcoholism results from an interplay between genetic and environmental factors, and is linked to brain defects and associated cognitive, emotional, and behavioral impairments. A confluence of findings from neuroimaging, physiological, neuropathological, and neuropsychological studies of alcoholics indicate that the frontal lobes, limbic system, and cerebellum are particularly vulnerable to damage and dysfunction. An integrative approach employing a variety of neuroscientific technologies is essential for recognizing the interconnectivity of the different functional systems affected by alcoholism. In that way, relevant experimental techniques can be applied to assist in determining the degree to which abstinence and treatment contribute to the reversal of atrophy and dysfunction. These studies have elucidated the component processes of memory, problem solving, and cognitive control, as well as visuospatial, and motor processes and their interactions with cognitiveOther hypotheses, based on factors such as aging, gender, and genetics, have been developed to explain various alcohol-related neurological consequences. Many pharmacological treatments to improve neuropsychological functioning in alcoholics have been tested, but none has proved entirely successful. With prolonged abstinence, however, slow recovery of cognitive functioning can occur in some cases. control processes. Another large area of research has focused on observable brain pathology,

Keywords: Alcohol dependence, alcoholism, alcohol and other drug effects and consequences,alcohol use disorders brain, brain structure, age,gender,health.brain function.

Introduction

Looking at publications from the early 1970s,one is struck by the lack of research on alcohol's actions on the brain.However,closer consideration shows that there also was a lack of neurobiology research in general, moreover, most of the techniques critical to modern neuroscience were not available in 1970. Alcoholic beverages contain ethanol, a psychoactive drug with relaxant and euphoric effects, consumed by people throughout the world. In general, the effects of alcohol intoxication follow a biphasic time course as the initial feelings of relaxation and exuberance give way to hangover, exhaustion, and depression, or vomiting and loss of consciousness in cases of higher doses[1].Criteria for classifying someone as an alcoholic vary[2], but it is thought that excessive alcohol use and alcoholism exist along a continuum of alcohol-disorders associated with increased frequency of a harmful drinking pattern[3].

Risky drinking patterns for men are defined as consuming more than 14 drinks per week, or more than four drinks in a single day at least once a month; for women, the limits are more than seven drinks per week and three drinks per day .Alcoholism has devastating consequences, but not all alcoholics are equally at risk for brain changes and neurobehavioral deficits. Nearly half of the estimated 18 million people in the USA who are problem drinkers appear to be free of cognitive, sensory, or motor impairments. By contrast, upwards of 2 million alcoholics develop permanent and debilitating conditions that require lifetime custodial care[4]. However, most problem drinkers have mild neuropsychological difficulties, which improve within a year of abstinence; Fein et al. 2006b).though structural and functional brain damage is partially reversible after several weeks of abstinence[5], the underlying mechanisms are poorly understood. It is clear, however, that the locus and extent of brain damage, as well as the type and degree of impairment, differ across individuals. Such differences suggest that certain factors increase the likelihood of developing cognitive, sensory, or motor impairments with alcohol misuse. Among the important factors that must be considered are demographic variables (e.g., age, gender, socioeconomic background, and education), genetics and family history of alcoholism, alcohol use patterns (e.g., the age of onset of alcohol consumption, the type and amount of alcohol consumed, severity and duration of the dependency, duration of abstinence, nutritional status during periods of consumption), and the use or abuse of other psychoactive substances and nicotine[6]Additionally, overall physical and mental health are important factors, because

comorbid medical, neurological, and psychiatric conditions not only can interact to aggravate alcoholism's effects on the brain and behavior, but they also can contribute to further drinking[7].

Gender

Gender-related differences in the susceptibility, progression and clinical outcomes of alcohol dependence are well-known. However, the neurobiological substrates underlying such differences remain unclear. In the past decade, there has been an increasing interest in alcoholism-related gender differences with respect to possible changes in brain and behavior[7]. However, the degree to which men and women differ with respect to these changes remains controversial. For example, in a recent cross-sectional, population-based study in which gender differences in cognitive performance were explored in relation to alcohol consumption[8] drinking data were collected from men and women between 35 and 85 years of age, and the participants were classified into non, light, moderate, and heavy drinking subgroups. There were clear gender differences in episodic memory (favoring women) and visuospatial tasks (favoring men). When these gender differences were examined by drinking group, visuospatial performance favoring men disappeared for the moderate to heavy drinking groups, but higher performance by women on episodic memory tasks was consistent across all levels of alcohol consumption. The results suggested that moderate alcohol intake may be less detrimental to women than to men.

In other studies, Sullivan and her colleagues administered an extensive battery of neuropsychological tests to recently detoxified alcoholic men and women[9] compared with nonalcoholic control men and women. In alcoholic men and women alike, there were deficits in visuospatial abilities and balance. The alcoholic men, but not the women, had deficits in executive functions and gait, and the alcoholic women, but not the men, had additional impairments in short-term memory and fluency. In both gender groups, there was relative preservation of declarative memory and upper limb mobility reported that although alcoholic men and women showed impaired performance on neuropsychological tests relative to same-sex nonalcoholic control participants, only the alcoholic men differed from their controls on a measure of visually evoked event-related brain potentials. Other investigators found that alcoholic men and women displayed similar electrophysiological abnormalities[10].

Age

Normal chronological aging is associated with a number of physiological changes suggesting increased sensitivity to alcohol. For example, with declining body water content, older people who drink alcohol tend to have increased blood alcohol concentration compared to younger people, and aging interferes with the body's ability to metabolize alcohol[11]. Neuroanatomical changes seen in aging are similar to those associated with chronic alcoholism. In both, cerebral atrophy is most prominent in the frontal lobes. Other effects include greater than normal ventricular enlargement and widening of the cerebral sulci of alcoholics in relation to increasing age Given the observed morphological similarities in the brains of alcoholic and aging nonalcoholic individuals, researchers sought to characterize parallels in functional decline associated with alcoholism and aging[12], and some investigators proposed that alcoholism is ass

HealthMedical conditions concomitant with alcoholism that are most likely to influence neurobiological and neurobehavioral functioning include liver disease, cardio-vascular disease, and malnutrition. Thus, poor liver function[12]and hypertension have been associated with drinking outside of meals, and certain arrhythmias have been associated with binge drinking. Thiamine (vitamin B1) deficiency, a consequence of poor diet, can contribute to Alcohol-Induced Persisting Amnestic Disorder (Korsakoff's syndrome), a severe disorder characterized by permanent cognitive and emotional deficits[13]. Other common neurological conditions in alcoholics are head injury, encephalopathy, and fetal alcohol syndrome (or fetal alcohol effects).

Family history

In an attempt to clarify the nature of genetic factors in relation to alcoholism, the National Institute on Alcohol Abuse and Alcoholism (NIAAA) sponsored a multi-institutional program: Collaborative Studies on Genetics of Alcoholism (COGA) in 1989. Since then, COGA investigators have successfully recruited thousands of individuals from hundreds of extended families densely affected by alcoholism. The investigators have collected detailed and extensive clinical, neuropsychological, electrophysiological, biochemical, and genetic data. Evidence from these studies has led to the identification of chromosomal regions containing genes that influence alcoholism risk and related phenotypes[14]. Subsequently, single nucleotide polymorphisms (SNPs) have been geno-typed in positional candidate genes

located within the linked chromosomal regions, and analyzed for association with these phenotypes. Using this sequential approach, COGA investigators have reliably detected and identified associations with specific genes contributing to the risk for alcoholism.

Accute effects of ethanol ingestion

Alcohol's effects on the brain and behavior depend upon an individual's blood alcohol concentration (BAC). Low doses can have a stimulating effect, and higher levels can have depressant effects. In addition, effects can differ depending on the time lapsed since ingestion; the same BAC may result in different effects on the ascending versus descending limbs of the BAC curve[15]. Individuals also differ in their tolerance to acute intoxication. Even when people are subjected to the same environmental conditions, their responses to a given dose of alcohol vary significantly on metabolic, physiological, subjective, cognitive, motor, and other measures. The pharmacokinetics (time course of absorption, distribution, metabolism, and excretion of ethanol) varies significantly when alcohol is administered orally, but much less so when alcohol is given intravenously[16].

Alcohol effected neural system behavior

We collapsed findings from the two cerebral hemispheres. In viewing, therefore, it is important to note that the differences between alcoholic and nonalcoholic groups are exclusive of brain laterality effects; these effects are sensitive to stimulus materials (e.g., verbal versus visuospatial) and task demands (e.g., attention, perception, motor response, etc.; . Thus, because alcoholics commonly display a pattern of deficits that includes visuospatial, attentional, and emotional abnormalities characteristic of patients with right hemisphere damage, some investigators have suggested that the right hemisphere may be more vulnerable to the effects of alcoholism than the left hemisphere[17]. As evidence accumulates, it may favor the view that group differences between thehemispheres may be greater for the right hemisphere than for the left

Frontal lobe structure and function

Emotional changes have direct social and interpersonal significance. Among the abnormalities are affective processing deficits such as a diminished ability to recognize facial

expressions of emotion[18] and to decipher affective prosody in spoken language. The abnormalities in emotional perception have been attributed to a combination of underlying factors, e.g., visuospatial deficits, abnormal processing of social information, poor inhibitory control, and interpersonal stress

Limbic system structure and function

The limbic system monitors internal homeostasis, mediates memory and learning, and contributes to emotional feelings and behaviors. The limbic system also drives important aspects of sexual behavior, motivation, and feeding behaviors. Primary areas of the limbic system include the hippocampus, amygdala, septal nuclei, hypothalamus, and anterior cingulate gyrus. For the purpose of this review, because numerous studies of alcoholics have reported abnormalities in the amygdala, hippocampus, and hypothalamus, the discussion is focused on those brain

Amygdala

Neuroimaging studies have shown that the amygdala responds to facial expressions of many emotions, especially those with negative affective qualities such as sadness, anger, and fear[19], even in the absence of conscious awareness of their presentation to subjects. Neuroimaging studies have shown that conditioned responses to both aversive and positive stimuli are processed and largely mediated by the amygdala, having connections to early sensory processing areas as well as toautonomic centers[20].

Hippocampus

Results of a nonhuman animal study have suggested that the deleterious effect of ethanol on the survival of newly-formed neurons in the adult rat hippocampus could result in impairment of hippocampal-dependent cognitive functions[21]. Neurogenesis is primarily a developmental process that involves the proliferation, migration, and differentiation into neurons of primordial stem cells of the central nervous system. Neurogenesis declines until it ceases in the young adult mammalian brain, with two exceptions: The olfactory bulb and the hippocampus produce new neurons throughout adult life. The ethanol-induced reductions in hippocampal neurogenesis can be attributed to two general mechanisms: an effect on cell

proliferation or on cell survival. These changes in hippocampal structure could be part of the anatomical basis for cognitive deficits observed in alcoholism.

Hypothalamus

Although anterograde amnesia is the most obvious presenting symptom in Korsakoff patients, these individuals have additional cognitive and emotional impairments[22].Like patients with bilateral prefrontal cortical lesions, Korsakoff patients are abnormally sensitive to distractions (proactive interference). This sensitivity may be due to alcoholism-related prefrontal dysfunction, which impairs the ability to counteract the effects of cognitive interruptions. In addition to their memory problems and their sensitivity to interference, Korsakoff patients also tend to repeat unnecessary behaviors (perseverative responding), have restricted attention, retarded perceptual processing abilities, ataxia, and decreased sensitivity to reward contingencies.

Cerebellar structure and function

The past two decades, careful study has expanded the purview of the cerebellum to include influence on functions classically associated with frontal lobe functioning[23]. As noted in the previous section on frontal lobes, this part of the brain has executive control functions such as cognitive flexibility, speed in allocation of attentional resources, shifting ability, inhibition of perseverative errors, abstractive and planning skills, and suppression of irrelevant information. Together, these observations suggest a functional role for frontocerebellar circuitry. Further, cerebellar volume shrinkage in alcoholics has been shown to correlate with performance on tests of executive function, traditionally attributed to frontal pathology, thus revealing the importance of disrupted frontocerebellar circuitry in the constellation of alcoholism-related functional impairments[24]. Additionally, an fMRI study of alcoholic and nonalcoholic control subjects performing a verbal working memory task showed that despite comparable levels of task performance by the two groups, the alcoholic group exhibited greater fMRI activation than the control group in the right superior cerebellar and left frontal regions. As Sullivan and her colleagues have suggested, it may be that increased demands on frontal brain regions may be incurred to overcome alcoholism-related impairments, and that the cerebellum provides supplementary compensation for maintaining information in a compromised brain system[25]

Right hemisphere structure and function

Findings with respect to hemispheric differences in alcoholics with the use of functional brain imaging studies also have shown inconsistent results. There have been reports that cerebral blood flow of the RH is more affected than the LH. Other studies have found either no difference in cerebral blood flow and glucose metabolism between the halves of the brain[26], or increased hypometabolism in the LH). To complicate matters, found that the right frontal cortex showed greater hypometabolism than the left, and the left parietal cortex showed greater hypometabolism than the right.

Implications for Treatment and Recovery

-Because alcoholism is associated with diverse changes to the brain and behavior, treatment professionals might find it most helpful to use a combination of neuropsychological observations and structural and functional brain imaging results in developing predictors of abstinence versus relapse, with the purpose of tailoring treatment methods to each individual patient. For example, the development of effective medications for controlling alcoholism relies upon knowledge about the neuroanatomical origins of neurotransmitters involved in craving, intoxication, and addiction. Neuroimaging methods have already provided significant insight into the nature of brain damage caused by heavy alcohol use, and the integration of results from different methods of neuroimaging will spur further advances in the diagnosis and treatment of alcoholism-related damage. Clinicians also can use brain imaging techniques to monitor the course of treatment because these techniques can reveal structural, functional, and biochemical changes in patients across time as a result of abstinence, therapeutic interventions, withdrawal, or relapse. Neuroimaging research already has shown that abstinence of less than a month can result in an increase in cerebral metabolism, particularly in the frontal lobes, and that continued abstinence can lead to at least partial reversal in loss of brain structure and function[27]. Thus, through the combined efforts of scientists and clinicians, important strides already have been made in the diagnosis, prevention, and treatment of alcoholism, and hopefully there will be continued advances in the future.

Conclusions

Subsequent relapsers displayed increased brain atrophy in brain areas associated with error monitoring and behavioral control. Correcting for gray matter reductions, we found that, in these patients, alcohol-related cues elicited increased activation in brain areas associated with attentional bias toward these cues and that, in patients who remained abstinent, increased activation and connectivity were observed in brain areas associated with processing of salient or aversive stimuli.

Alcoholics are a diverse group. They experience different subsets of symptoms, and the disease has different origins and modulating influences for different people. Therefore, to understand the effects of alcoholism, it is important to consider the influence of a wide range of variables on a particular behavior or set of behaviors. The underpinnings of alcohol-induced brain defects are multivariate; to date, the available literature does not support the assertion that any one variable can consistently and completely account for these impairments. Instead, the identification of the most salient variables is a primary focus of current research. In summary, the technology for neurobiological studies was remarkably primitive in 1970, and few laboratories were applying even these limited approaches to understanding neuronal actions of alcohol.

References

1. Alling C, Bostrom K. Demyelination of the mamillary bodies in alcoholism. A combined morphological and biochemical study. *Acta Neuropathologica (Berl)* 1980;50:77–80. [PubMed] [Google Scholar]
2. Badsberg-Jensen G, Pakkenberg B. Do alcoholics drink their neurons away? *Lancet.* 1993;342:1201–1204. [PubMed] [Google Scholar]
3. Cardenas VA, Studholme C, Gazdzinski S, et al. Deformation-based morphometry of brain changes in alcohol dependence and abstinence. *NeuroImage.* 2007;34:879–887. [PMC free article] [PubMed] [Google Scholar]
4. De Rosa E, Desmond JE, Anderson AK, et al. The human basal forebrain integrates old and the new. *Neuron.* 2004;41:825–837. [PubMed] [Google Scholar]

5. Delaveau P, Salgado-Pineda P, Wicker B, Micallef-Roll J, Blin O. Effect of levodopa on healthy volunteers' facial emotion perception: An FMRI study. *Clinical Neuropharmacology.* 2005;28(6):255–261. [PubMed] [Google Scholar]
6. Desmond JE, Chen SH, DeRosa E, Pryor MR, Pfefferbaum A, Sullivan EV. Increased frontocerebellar activation in alcoholics during verbal working memory: An fMRI study. *Neuroimage.* 2003;19(4):1510–1520. [PubMed] [Google Scholar]
7. Dirksen CL, Howard JA, Cronin-Golomb A, Oscar-Berman M. Patterns of prefrontal dysfunction in alcoholics with or without Korsakoff's syndrome, patients with Parkinson's disease, and patients with rupture and repair of the anterior communicating artery. *Neuropsychiatric Disease and Treatment.* 2006;23(3):327–339. [PMC free article] [PubMed] [Google Scholar]
8. Doggrell SA. Which treatment for alcohol dependence: Naltrexone, acamprosate and/or behavioural intervention? *Expert Opinion on Pharmacotherapy.* 2006;7(15):2169–2173. [PubMed] [Google Scholar]
9. Eckardt MJ, File SE, Gessa GL, Grant KA, Guerri C, Foffman PL, et al. Effects of moderate alcohol consumption on the central nervous system. *Alcoholism: Clinical and Experimental Research.* 1998;22:998–1040. [PubMed] [Google Scholar]
10. Edenberg HJ, Foroud T. The genetics of alcoholism: Identifying specific genes through family studies. *Addiction Biology.* 2006;11(3-4):386–396. [PubMed] [Google Scholar]
11. Ellis RJ, Oscar-Berman M. Alcoholism, aging, and functional cerebral asymmetries. *Psychological Bulletin.* 1989;106:128–147. [PubMed] [Google Scholar]
12. Errico AL, King AC, Lovallo WR, Parsons OA. Cortisol dysregulation and cognitive impairment in abstinent male alcoholics. *Alcoholism: Clinical and Experimental Research.* 2002;26(8):1198–1204. [PubMed] [Google Scholar]
13. Everitt BJ, Cardinal RN, Parkinson JA, Robbins TW. Appetitive behavior: Impact of amygdala-dependent mechanisms of emotional learning. *Annals of the New York Academy of Science.* 2003;985:233–250. [PubMed] [Google Scholar]
14. Fein G, McGillivray S, Finn P. Normal performance on a simulated gambling task in treatment-naive alcohol-dependent individuals. *Alcoholism: Clinical and Experimental Research.* 2006;30(6):959–966. [PMC free article] [PubMed] [Google Scholar]

15. Fein G, Torres J, Price LJ, Di Sclafani V. Cognitive performance in long-term abstinent alcoholic individuals. *Alcoholism: Clinical and Experimental Research.* 2006;30(9):1538–1544. [PMC free article] [PubMed] [Google Scholar]

16. Fabian MS, Parsons OA. Differential improvement of functions in recovering alcoholic women. *Journal of Abnormal Psychology.* 1983;92:87–95. [PubMed] [Google Scholar]Goodwin DW, Crane JB, Guze SB. Phenomenological aspects of the alcoholic "blackout." *British Journal of Psychiatry.* 1969;115:1033–1038. [PubMed] [Google Scholar]

17. Lancaster FE. Ethanol and white matter damage in the brain. In: Hunt WA, Nixon SJ, editors. *Alcohol-Induced Brain Damage: NIAAA Research Monograph No. 22.* Rockville, MD: National Institute of Health; 1993. pp. 387–399. [Google Scholar]

18. Lim KO, Pfefferbaum A. Segmentation of MR brain images into cerebrospinal fluid spaces, white and gray matter. *Journal of Computer Assisted Tomography.* 1989;13:588–593. [PubMed] [Google Scholar

19. Makris N, Oscar-Berman M, Jaffin SK, et al. Decreased volume of the brain reward system in alcoholism. *Biological Psychiatry.* 2008;64:192–202. [PMC free article] [PubMed] [Google Scholar]

20. NIAAA . *Ninth special report to the US Congress on alcohol and health.* NIAAA; Bethesda, MD: 1997. [Google Scholar]

21. Nicolás JM, Catafau AM, Estruch R, Lomeña FJ, Salamero M, Herranz R, et al. Regional cerebral blood flow-SPECT in chronic alcoholism: Relation to neuropsychological testing. *Journal of Nuclear Medicine.* 1993;34(9):1452–1459. [PubMed] [Google Scholar]

22. Parsons OA. Alcohol abuse and alcoholism. In: Adams RL, Parsons OA, Culbertson JL, Nixon SJ, editors. *Neuropsychology for clinical practice.* American Psychological Press; Washington, D.C.: 1996. pp. 175–201. [Google Scholar]

23. Parsons OA, Leber WR. The relationship between cognitive dysfunction and brain damage in alcoholics: Causal, interactive, or epiphenomenal? *Alcoholism: Clinical and Experimental Research.* 1981;5(2):326–343. [PubMed] [Google Scholar]

24. Pfefferbaum A, Sullivan EV. Disruption of brain white matter microstructure by excessive intracellular and extracellular fluid in alcoholism: Evidence from diffusion tensor imaging. *Neuropsychopharmacology.* 2005;30(2):423–432. [PubMed] [Google Scholar]

25. Pfefferbaum A, Sullivan EV, Mathalon DH, Lim KO. Frontal lobe volume loss observed with magnetic resonance imaging in older chronic alcoholics. *Alcoholism: Clinical and Experimental Research.* 1997;21(3):521–529. [PubMed] [Google Scholar]

26. Rangaswamy M, Porjesz B, Ardekani BA, Choi SJ, Tanabe JL, Lim KO, et al. A functional MRI study of visual oddball: Evidence for frontoparietal dysfunction in subjects at risk for alcoholism. *Neuroimage.* 2004;21(1):329–339. [PubMed] [Google Scholar]

27. Ratti MT, Bo P, Giardini A, Soragna D. Chronic alcoholism and the frontal lobe: Which executive functions are impaired? *Acta Neurologica Scandinavica.* 2002;105(4):276–281. [PubMed] [Google Scholar]

INSIGHTS OF DRUG ABUSE ON COGNITIVE PROCESSES

Dr N. Anitha, Dr Ch. Lalitha Kumari and Sri K. Nagaraju
Dept. of Zoology, D.K.Govt. College for Women (A), Nellore, AP, India
Correspondence: nelapatianitha75@gmail.com

ABSTRACT:

Drug addiction also called substance use disorder is a disease that alters the functioning of brain and behaviour, leading to an inability to control. It influences on the internal thoughts, feelings and one's behaviour. The cognitive functions on perception, attention, memory and reasoning. Each of this work together to integrate new knowledge. Cognitive skills play a vital role in the overall development of an individual like thinking, reading, remembering and decision making. Psychiatric drugs, anticonvulsants, antidepressants, narcotic pain killers, sleeping pills, anti seizure drugs etc cause dementia and delirium. Antidepressants usage is associated with increased risk of developing cognitive impairment and dementia. Beta-blockers interfere with epinephrine and nor epinephrine that cause memory loss as they block the action of acetylcholine, a chemical messenger that plays a vital role in the central and peripheral nervous system. The development of brain during adolescence is characterized by biological, cognitive and social changes because the linkages between their reward seeking behaviour and impulse are still in developing stage. The substance at an early stage leads to the impairment of brain and vulnerable. The impairment of cognitive development is old age factors, family history of dementia, diabetes, obesity etc.

Keywords: Cognitive, abuse, youth, impairment, depression, psychological.

Addiction is a neuropsychological disorder that alters the functioning of brain and weakens the self-control. Drug addiction is a chronic disorder leads to drug abuse despite their harmful effects. It causes damage to the functioning of the organs and persist throughout the life and leads to death if left untreated. Substances like nicotine, opioids, cocaine, heroin, foods with high fat and sugar content are involved in addiction. The factors that leads for substance addiction include economic status, drug experimentation, mental disorders, lack of parental supervision and usage of drugs with peer team.

The Association of Psychological Science writes that only between 20-30% of people who use drugs actively develop an addiction. Billions of brain cells communicate by

passing chemical messages at synapse by neurotransmitter like dopamine. It is secreted by the brain during healthy activities and one of the factors for reduced dopamine is drug abuse like cocaine or heroin that force the brain to release massive amounts and preventing it from reabsorbing the dopamine. The brain imaging techniques like MRI, positron emission tomography scan revealed that in an addicted brain severe exposure to drugs has corrupted the regions and can permanently change the molecular and neurochemical structure and functioning of the brain. Individuals addicted to substance look differently and vary from person to person. After many years of research scientists identified addiction as a disease, the disease model, genetic combination and other environmental factors.

According to new disease model, it is a disorder of the part of the brain in making proper decision. If one becomes addicted to cocaine, the defect is stress-induced hedonic regulation. Cocaine increases the amount of dopamine in brain that is related to control of movement and reward. The reward, pleasure and motivation centres of the brain are affected by the substance used. Opioid drugs emit powerful chemicals in the brain that makes people to be dependent. The normal functioning of the brain is changed and without these drugs one can no longer feel normal. Reports have shown that individuals who use drugs show abnormal results that affects on the cognition. Repeated usage of these drugs can impart the brain where one cannot do normal daily activities like sleep, walk in a straight line, speak properly. The reason behind is, drugs affect the brain, in turn affects on the behaviour.

In brain receptors – opiate substance triggers opiate receptors. In a case study a man who overly abused alcohol and other drugs can no longer form memories. By repeated usage of drugs brain cannot handle it and show difficulty in remembering. The first sign is short-term memory loss immediately after using drugs. Excessive alcohol usage is referred to as 'Blacking out' where one cannot remember anything from the night before and also long-term memory is also affected. The longer we use drugs, it shows permanent effect on long-term memories.

The various chronic drug disorders and their effect on cognition

Nicotine – deficits in working memory

Cocaine – deficits in cognitive flexibility

Opioids - deficits in cognitive flexibility

Alcohol - deficits in working memory and attention

Cannabis - deficits in cognitive flexibility and attention

Motor functioning becomes slow, impaired and damaged after drug addiction.

Hallucinogens act on neural circuits in the brain that utilize serotonin. The mental illness and drug addiction are linked together and one causes the other or sometimes both. Depression leads to isolation and drug makes us happy. So, the individual slowly becomes dependent and then addicted. Similarly, anxiety and stress individuals become addicted to depressants or substance that calm them and relax. Nearly 70% of people addicted to drugs or alcohol also have mental health disorder.

Addiction to drugs can start with experimental use or prescribed medicines. The risk of addiction depends on the type of drug. Some drugs like opioid, pain killers show higher risk and cause addiction more quickly. In general people assigned male at birth are more likely to develop substance use disorder. Substance use or misuse is highest among people aged 18-25 years. About 20% of people in the US have depression or anxiety disorder. Tobacco use disorder is the most common substance use disorder worldwide and in the United States.

To overcome the drug abuse – to unlearn negative thought and behaviour and learn to adopt healthier thinking patterns and habits.

References:

1. Kelley AE. Memory and addiction: Shared neural circuity and molecular mechanisms. Neuron. 2004;44;161-179.DOI: 10.1016/j.neuron.2004.09.016.
2. Thomas J. Gould, Addict Sci Clin Pract. 2010 Dec; 5(2): 4-14
3. Cahill L, McGaugh JL. Mechanisms of emotional arousal and lasting declarative memory. Trends in Neurosciences. 1998;21(7):294-299.
4. Claudia Juarez-Portilla, Tania Molina-Jimenez, Jean-Pascal Morin, Gabriel Roldan-Roldan and Rossana Citiali Zepeda. Influence of Drugs on Cognitive Functions. Chapter Metrics Overview. DOI: 10.5772/intechopen.71842.
5. Dwoskin LP, Glaser PE, Bsrdo MT. Methamphetamine. In: Addiction Medicine. New York: Springer; 2010. Pp. 1049-1061. DOI: 10.1007/978-1-4419-0338-9-52.
6. Rendell PG,Mazur M, Henry JD. Prospective memory impairment in former users of methamphetamine. Psychopharmacology. 2009;203:609-616.DOI: 10.1007/s00213-008-1408-0.

Human future: A glimpse into the drugs

Dr. G.Swathi

Lecturer in Zoology, Government Degree and PG College, Puttur.

Abstract

A drug is a chemical substance, typically of known structure, which, when administered to a living organism, causes a change in an organism's physiology or psychology. These drugs have been used by humans for a long time. Drugs that have been developed for life saving conditions are at the top of the list, since their discovery and implementation has often paved the way for further development that has caused human society to prosper. They shed the light on quality of life and improved the life span. There are some drugs which are used as magic supplements for expanding life span. These were consumed not only to improve health but also to have psychological experiences like entheogens, hallucinogens like psychedelics, dissociatives, or deliriants. Some psychoactive substances may also play a significant part in the rituals. The most common drugs used in ancient cultures are cannabis and intoxicants. Ancient Greek culture, Vedic culture, etc had used these psychoactive drugs in restricted rituals. But, in the present scenario, the usage of psychoactive drugs has taken an awkward path making the innocent young and depressed people into its fangs. These drugs when used continuously change a person's mood or behavior by acting on the central nervous system. The psychoactive drugs are commonly known as narcotic drugs which were classified into 7 schedules. In this paper we will discuss how drugs shape the future of humans.

Keywords: Psychoactive drugs, supplements, central nervous system.

SOCIO AND ECONOMIC EFFECTS FOR DRUG ABUSE: A STUDY IN ANDHRA PRADESH

B. Peera Kumar, Lecturer in Economics, SKR Govt. Degree College, Gudur.

Drug abuse is a major social issue. Today there is no part of the world which is free from drug abuse. India is also caught in this vicious problem of drug abuse. Drug addiction causes a huge cost on human resources as well as it promotes illegal production and distribution of drugs. Drug abuse has a direct impact on social and economic aspect of the nation. The impact of drug is realized in workplace, family and the society. It results in violence at home and gang wars in cities, increase crimes and even stresses the public health system and we find young mass addicted to drugs. It leads to unsafe life. Drug addiction not only breaks the family harmony but also puts high economic burden on the society. The economic impact due to Drug abuse is immeasurable. The use, production and marketing of drugs, emergence of a class of drug consumers is a huge challenge for mankind. It ultimately leads to unemployment, weak human resources, weak brain power, unhealthy society and increasing crime at large. The socioeconomic impact is associated with the expenditure incurred. We need to design a policy to prevent drug abuse. We must develop a prevention strategy and we need to educate the youth and protect the human resources. The impact is felt in various domains of life such as: family, industries, workplace and economy of the country.

Neuroprotective effect of micronutrients and Antioxidants in Drug abuse

Dr. C. Samson Raju, Dr.C.Venkatekrishnaiah, Dr.G.Swathi
Lecturer in Zoology,
Govt. Degree College, Puttur, Tirupati District, Andhra Pradesh.

ABSTRACT

Drugs of abuse act on the brain's reward pathway, which is a network of brain regions that are involved in regulating pleasure, motivation, and learning. Drugs of abuse can enhance the release of dopamine, a neurotransmitter that is involved in the regulation of reward and motivation. This increase in dopamine release can lead to the reinforcement of drug-seeking behavior, which can contribute to the development of addiction. Drugs of abuse can also alter the activity of other neurotransmitters, such as serotonin, norepinephrine, and gamma-aminobutyric acid (GABA), which can contribute to the complex effects of drug abuse on behavior. Psychological factors such as stress, trauma, and mental health disorders such as depression and anxiety can contribute to drug abuse to cope with negative emotions and experiences. Social factors such as peer pressure, cultural norms, and access to drugs can contribute to drug abuse. Effective pharmacological treatments for drug abuse and addiction have not yet been identified.

Drug addiction therapy involves a comprehensive approach that addresses the individual's specific needs and the severity of their addiction. Medication-assisted treatment, detoxification, behavioural therapies, support groups, and rehabilitation programs are some general treatment approaches that can help individuals with drug abuse disorders to overcome their addiction and achieve long-term recovery. The dopaminergic pathway has been shown to be affected by a number of micronutrients and antioxidants, such as Omega-3 fatty acids, Selenium, Magnesium, Iron, Zinc, Vitamin B6, Vitamin B12, Vitamin D, and Vitamin E. These compounds are involved in the synthesis of dopamine, dopaminergic signalling, regulating neuronal activity, synaptic plasticity and their deficiencies lead to increased risk of neurodegenerative diseases. Hence, these micronutrients and antioxidants should be supplemented in adequate quantities along with a balanced diet.

Key words: Drug addiction, micronutrients, neurotransmitters,

NATIONAL SEMINAR ON DRUG ADDICTION AND ABUSE AMONG YOUTH

"DRUG USE IN INDIA: SOME HISTORICAL PERSONALATIES IN INDIA."

Dr. Govindu Surendra, Assistant Professor, Dept of History, S.K.R. Govt. Degree College, GUDUR, Tirupathi dist. govindusurendra@gmail.com; Mob: 9866008662

ABSTRACT

According to the *Oxford English Dictionary*, the term "addict" in the meaning of "attached by one's own inclination, self-addicted to a practice; devoted, given, inclined to" has been used since the first part of the 16th century. India has an ancient tradition of usage drugs in daily activities and ceremonial rituals. One manifestation of the long history of drug use is that humans have used mind-altering plants since prehistoric times. "Early humans discovered that eating some plants gave a feeling of relaxation, happiness, drowsiness, or peace," This paper endeavors to discuss some historical personalities since an ancient time to modern times has one of the socio habits to take drugs. Our early ancestors lived as hunter-gathers and –as shown by the culture of human groups who retained this lifestyle. In Vedic age Soma was a sacred beverage in the mention Rig-Veda. Some drugs have been used as medications for most of human history. Alcohol, nicotine, and caffeine, being palatable for their mild psychotropic properties, are examples of widely consumed drugs. The oldest seeds of cultivated vines so far discovered and carbon dated were found in Georgia and belong to the period from 7000 to 5000 B.C.E. Coffee was largely used throughout the Islamic world at the end of the 15th century. Its use spread rapidly in Europe, and Europeans introduced coffee plants into their colonies. Tea's history is much older, since the plant was already being harvested in China in the 3rd century B.C.E. How do Hindu and Muslim view substance addiction? What happens to the soul of the person suffering from addictive disorder? These are some of the questions that this article tries to answer.

Keywords: *drug, addiction, history, human, soul, lifestyle, Alcoholics*

Role of ICT in Drug Addiction and Abuse among Youth

Lakshmi Bheemavarapu
Lecturer in Computer Applications
SKR Government Degree College, Gudur, Tirupati Dist.
jlr.lakshmi@gmail.com, Mobile No - 7893204741

Abstract

A drug is any chemical substance that causes a change in an organism's physiology or psychology when consumed. Drug addiction is a strong desire to have drug and its abuse is the improper use of the drug. Information and Communication Technology (ICT) means the use of computers, mobiles, internet and other technologies to get and share information in electronic format. As today's young people are digital natives there is a close relation between the youth and ICT. Parent child relationships are also getting affected by ICT. The education system is using it as part of its curriculum and the increased use of social networking websites is also making the young people to spend more time with ICT. Because of this close contact of youth with ICT they are more prone to drug usage, abuse and addiction. Drug mafia is using Internet especially dark web as their main tool to spread its business and attracting youth to expand their business. Because of increased pressure in current education system, lack of parental caring, peer influence and other factors are forcing the youth towards drug usage and its abuse. This paper focuses a light on the role of ICT in drug usage, its affects, addiction and abuse among youth, and also its role in prevention, treatment and awareness about it.

Keywords: drug, abuse, addiction, ICT, dark web

A case study on Drug addiction and abuse among the Adolescent Age Group

1. Dr.D.Sujatha, Lecturer in Zoology, Visvodaya Government Degree College ,Venkatagiri , Tirupati (District)

2. Dr.D.Umamaheswari, Lecturer in Physics, SPW Degree and PG College Tirupati

Drug addiction and abuse among the students has become a global problem and it is responsible for millions of deaths. More men use drugs than women .Drug abuse occurs more frequently in young people than in other age groups. Since some drugs are more available and used more often than others. How much opium-heroin and coca-cocaine are produced and where? Tobacco and alcohol consumption account for nearly 5 million deaths annually worldwide. Adolescence is a time when enormous changes take place in the process of normal development. In many cultures it is, according to one observer, "a time for developing a person's sense of self identity, a process that involves separating from parental attachments and values and establishing new social ties, values and ideals. Crime and drugs may be related in several ways. Drugs may be closely linked to other major problems, such as the illegal use of guns, various forms of violence and terrorism. Education is the principal means of preventing drug abuse. In addition to educational institutions, other settings are important for the contributions they make to learning and socialization. Studies also confirm that the chance of becoming a cigarette smoker among males and females is almost equal however, the prevalence of regular alcohol consumption in males is slightly higher than in females.

NATIONAL SEMINAR ON DRUG ADDICTION AND ABUSE AMONG YOUTH

Drug addiction and abuse among youngsters: Preventive measures

Dr.Meesala Guru Sekhar[1]Dr.K.R. Shanmugam [2]and Kanchi Siva Prasad [3]

1. Assistant Professor,Department of Zoology, Government Degree College, Cumbum-523333,Prakasam(Dt), A.P.

2.Assistant Professor,Department of Zoology,PRR & VS Government Degree College, Vidavalur-524318,SPSR Nellore (Dt), A.P.

3.Assistant Professor,Department of Zoology, S.K.R.Government Degree College, Gudur-524101,Tirupati(Dt), A.P.

Abstract

Drug Addiction or habitual use of any chemical substance has altered states of body or mind for other than medically purposes. The global problem of addiction and drug abuse is responsible for millions of deaths. The majority of addicts are between 15 to 35 years of age and it is the most productive age group of the nation. With every addict the life of a whole family is affected. In recent years, India is seeing a rising trend in drug addiction. India is facing a major problem with the illicit use of drug, drug trafficking and consuming. The spread and entrenchment of drug abuse needs to be prevented.

A drug is a chemical substance whether or not obtained from natural sources which is taken for the pleasant effects it produces. Drug abuse regarded as a personality disorder, also be seen as worldwide epidemic with evolutionary genetic, physiology and environmental influences controlling and affecting human behaviour. However, there is reported increase in abuse of prescription drugs such as morphine ephedrine morphine, proxyvon, diazepam and codeinebased cough syrups.

The most common use of drug in India is alcohol, followed by cannabis,heroin opium, stimulants, benzodiazepines, antihistamines and LSD. The National level survey conducted on drugs use in India indicated that use of drugsis more in males compare with females. Economic burden, disturbed family environment, violence, and psychological problems are other consequences of drug abuse in the family.

Preventive Measures: Establishment of rehabilitation centresand conducting awareness drivesto drug addicts,proper government vigilance over drug trafficking, proper upbringing of

children, Inculcation of moral values at school level,availability of drug resisting pills,strong foundation of habits and values incalculate at an early age.

Keywords : Drug Addiction, Drug Abuse, Preventive measures

Correspondent author : **meesala1980@gmail.com**

Protective effect of medicinal plants on alcohol detoxification in experimental rats

K. R. Shanmugam[1*] M. Guru Sekhar [2]

[1] Department of Zoology, PRR & VS Government Degree College, Vidavalur, SPSR Nellore District, A.P

[2] Department of Zoology, Government Degree College, Cumbum, Prakasam District, A.P-India

Abstract

Alcohol intoxication refers to a clinically harmful condition induced by intake of alcohol, when alcohol and its metabolites accumulate in the blood stream faster than it can be metabolized by the liver. The major adverse effects of alcohol are the neurologic, gastrointestinal, and cardiovascular problems. Individuals who seek medical treatment for alcohol intoxication likely have additional medical problems related to chronic alcohol consumption or alcohol dependence. Herbal medicine especially ginger, garlic, curcumin have protective effects against alcohol intoxication. These medicinal plants will protect tissue damage caused alcohol. These medicinal plants also protects the tissues like liver, heart, kidney and brain from oxidative stress due to alcohol toxicity. The therapeutical potential of medicinal plants may be due to presence of photochemicals and antioxidant compounds. Our findings indicate that herbal medicines have significant protective effect on alcohol detoxification in experimental rats, suggesting its usefulness in the treatment of tissue injury caused by alcohol consumption.

Keywords: Alcohol intoxication, oxidative damage, herbal treatment, rats

Corresponding author : krshanmugamphd@gmail.com

Classification of Drugs- Specific reference to Hallucinogens

Dr. Kanchi Siva Prasad[1], Dr. Meesala Guru Sekhar[2] and Dr. P. Narayana Raju[3].

1. Lecturer in Zoology*, SKR Govt. Degree College, Gudur, Tirupati, Dt. AP.,
2. Dr. Meesala Gurusekhar, Govt. Degree College, Cumbum, Prakasam Dt.AP.,
3. Lecturer in Physical Education, SKR Govt. Degree College, Gudur, Tirupati, Dt. AP.,

Corresponding author email: *kanchi1976@gmail.com

ABSTRACT

Physicians have long recognized that different types of drugs affect people differently. Nonetheless, drugs may be categorized or classified according to certain shared symptomatologies or effects. The Drug Recognition Experts (DREs) categorization process is premised on these long-standing, medically accepted facts. DREs classify drugs in one of seven categories:

1.Central nervous system (CNS) depressants,
2. CNS stimulants,
3. Hallucinogens,
4. Dissociative anesthetics,
5. Narcotic analgesics,
6. Inhalants, and
7. Cannabis.

Drugs from each of these categories can affect a person's central nervous system and impair a person's normal faculties, including a person's ability to safely operate a motor vehicle.

(1) Central Nervous System (CNS) Depressants

CNS depressants slow down the operations of the brain and the body. Examples of CNS depressants include alcohol, barbiturates, anti-anxiety tranquilizers (e.g., Valium, Librium, Xanax, Prozac, and Thorazine), GHB (gamma hydroxybutyrate), Rohypnol, and many other anti-depressants (e.g., Zoloft, Paxil).

(2) CNS Stimulants

CNS stimulants accelerate the heart rate and elevate the blood pressure and "speed-up," or over-stimulate, the body. Examples of CNS stimulants include cocaine, "crack" cocaine, amphetamines, and methamphetamine ("crank").

(3) Hallucinogens

Hallucinogens cause the user to perceive things differently than they actually are. Examples include LSD, peyote, psilocybin and MDMA (Ecstasy).

(4) Dissociative Anesthetics

Dissociative anesthetics include drugs that inhibit pain by cutting off or dissociating the brain's perception of the pain. PCP, its analogs, and dextromethoraphan are examples of dissociative anesthetics.

(5) Narcotic Analgesics

Narcotic analgesics relieve pain, induce euphoria, and create mood changes in the user. Examples of narcotic analgesics include opium, codeine, heroin, demerol, darvon, morphine, methadone, Vicodin, and oxycontin.

(6) Inhalants

Inhalants include a wide variety of breathable substances that produce mind-altering results and effects. Examples of inhalants include Toluene, plastic cement, paint, gasoline, paint thinners, hair sprays, and various anesthetic gases.

(7) Cannabis

Cannabis is the scientific name for marijuana. The active ingredient in cannabis is delta-9 tetrahydrocannabinol, or THC. This category includes cannabinoids and synthetics like Dronabinol.

Key words: Drugs, Alcohol, Hallucinogens, addiction.

INTRODUCTION

Drugs are substances that change a person's mental or physical state. They can affect the brain works, how feel and behave, understanding and senses. This makes them unpredictable and dangerous, especially for young people. The effects of drugs are different for each person and drug. The study of drugs or chemicals and the effects they have on living animals is called pharmacology. A drug is a chemical that interacts with proteins in the body to affect a physiological function. This is the general idea behind all medicine. Once these chemicals are absorbed into the systemic circulation they bind with certain proteins and this

changes the functioning of the cell slightly. For example, anticancer drugs bind to proteins on the surface of cancer cells this stimulates the cells to die. In this case cell death is the physiological action of the drug. Proteins exist in many different forms in the body and have many different functions. Each protein has a specific function and is quite specific to the cell type that it acts on. For example, there are specific types of proteins called receptors. Receptors are embedded on the cell surfaces, there are different receptors for different types of cells. A liver cell will have different receptors than a cardiac cell. The receptor binds to other proteins and chemicals on the outside of the cell and this in turn creates a change in the functioning of the cell. Drugs that produce a change in the cell functioning are called agonists. Drugs that stop a normal function of the cell are called antagonists.

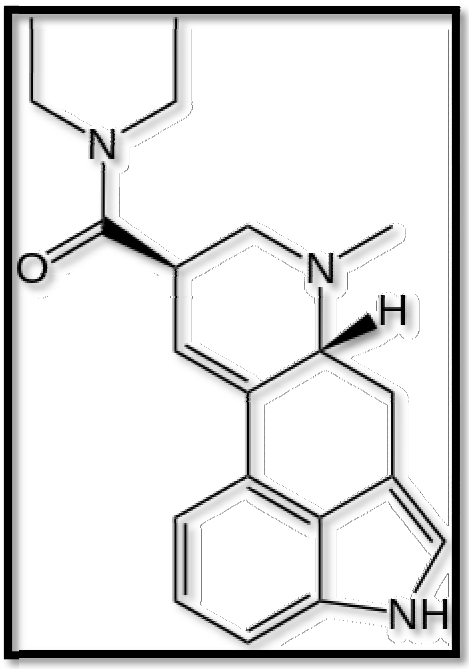
HALLUCINOGENS

Hallucinogens, or "psychedelics", are drugs that alter users' state of consciousness and produce different kinds of hallucinations. The main types of hallucinogens are d-lysergic acid diethylamide (LSD), hencyclidine (PCP), hallucinogenic amphetamines, mescaline and psilocybe mushrooms.

LSD - D-Lysergic Acid Diethylamide

LSD is a semi-synthetic drug derived from lysergic acid, which is found in a fungus that grows on rye and other grains. LSD, commonly referred to as "acid", is one of the most potent hallucinogens. It is usually sold on the street as small squares of blotting paper with drops containing the drug, but also as tablets, capsules or occasionally in liquid form. It is a colourless, odourless substance with a slightly bitter taste.

Lysergic acid diethylamide (LSD) chemical structure



(6aR,9R)-N,N-diethyl-7-methyl-4,6,6a,7,8,9-hexahydroindolo[4,3-fg]quinoline-9-carboxamide

Taking LSD leads to strong changes in thought, mood and senses in addition to feelings of empathy and sociability. However, the exact effects of LSD vary depending on the mental state of the user and the environment when taking the drug. The risks associated with LSD use short-term, LSD produces delusions and distorted perceptions. Sense of depth and time changes and colours, sound and touch seem more intense. Some LSD users experience severe, terrifying thoughts and feelings such as fear of losing control, fear of insanity and death, and despair. The physical effects are small compared to the psychological and emotional effects. They include dilated pupils, increased heart rate and blood pressure, loss of appetite, sleeplessness, dry mouth and tremors.

Lysergic acid diethylamide (LSD)

Lysergic acid diethylamide, commonly known as LSD (from German Lysergsäure-diethylamid), and known colloquially as acid, is a potent psychedelic drug.[1]. Effects typically include intensified thoughts, emotions, and sensory perception.[2]. At sufficiently high dosages LSD manifests primarily mental, visual, and auditory hallucinations.[3,4]. Dilated pupils, increased blood pressure, and increased body temperature are

typical.[5]. Effects typically begin within half an hour and can last for up to 20 hours (although on average, experiences last 8–12 hours).[6]. LSD is also capable of causing mystical experiences and ego dissolution. [7]. It is used mainly as a recreational drug or for spiritual reasons.[8]. LSD is both the prototypical psychedelic and one of the "classical" psychedelics, being the psychedelic with the greatest scientific and cultural significance.[9]. LSD is synthesized as a solid compound, typically in the form of a powder or a crystalline material. This solid LSD is then dissolved in a liquid solvent, such as ethanol or distilled water, to create a solution. The liquid serves as a carrier for the LSD, allowing for accurate dosage and administration onto small pieces of blotter paper called tabs. LSD is typically either swallowed or held under the tongue.[2,10]. LSD is pharmacologically considered to be non-addictive with low potential for abuse. Adverse psychological reactions are possible, such as anxiety, paranoia, and delusions. LSD is active in small amounts relative to other psychoactive compounds with doses measured in micrograms.[10]. It is possible for LSD to induce either intermittent or chronic visual hallucinations, in spite of no further use. Common effects include visual snow and palinopsia. In cases where this causes distress or impairment it is diagnosed as hallucinogen persisting perception disorder (HPPD). [10]. While there are no known cases of death from LSD overdose, LSD can cause injury and death as a result of accidents stemming from psychological impairment.[1,5]. The effects of LSD are thought to stem primarily from it being an agonist at the 5-HT2A (serotonin) receptor, and while exactly how LSD exerts its effects by agonism at this receptor is still not fully known, corresponding increased glutamatergic neurotransmission and reduced default mode network activity are thought to be key mechanisms of action.[1]. In addition to serotonin, LSD also binds to dopamine D1 and D2 receptors, which is why LSD tends to be more stimulating than compounds such as psilocybin. [10]. In pure form, LSD is clear or white in color, has no smell, and is crystalline.[13] It breaks down with exposure to ultraviolet light. [4]. LSD was first synthesized by Swiss chemist Albert Hofmann in 1938 from lysergic acid, a chemical derived from the hydrolysis of ergotamine, an alkaloid found in ergot, a fungus that infects grain.[4].

Conclusion:

LSD can cause pupil dilation, reduced appetite, profuse sweating and wakefulness. Other physical reactions to LSD are highly variable and nonspecific, some of which may be secondary to the psychological effects of LSD. Among the reported symptoms are elevated

body temperature, blood sugar, and heart rate, alongside goose bumps, jaw clenching, mouth dryness, and hyperreflexia. In negative experiences, numbness, weakness, nausea, and tremors have also been exhibited.[4].

References:

1. Nichols DE (April 2016). Barker EL (ed.). "Psychedelics". Pharmacological Reviews. 68 (2): 264–355
2. National Institute of Drug Abuse. January 2016. Archived from the original on April 17, 2016. Retrieved April 24, 2016.
3. Leptourgos P, Fortier-Davy M, Carhart-Harris R, Corlett PR, Dupuis D, Halberstadt AL, et al. (December 2020). "Hallucinations Under Psychedelics and in the Schizophrenia Spectrum: An Interdisciplinary and Multiscale Comparison". Schizophrenia Bulletin. 46 (6): 1396–1408.
4. Holze F, Vizeli P, Ley L, Müller F, Dolder P, Stocker M, et al. (February 2021). "Acute dose-dependent effects of lysergic acid diethylamide in a double-blind placebo-controlled study in healthy subjects". Neuropsychopharmacology. 46 (3): 537–544.
5. LSD profile (chemistry, effects, other names, synthesis, mode of use, pharmacology, medical use, control status)". EMCDDA. Archived from the original on April 28, 2021. Retrieved July 14, 2018.
6. "This is Why You Can't Escape an Hours-Long Acid Trip". Inverse. Archived from the original on June 11, 2021. Retrieved February 3, 2020.
7. Liechti ME, Dolder PC, Schmid Y (May 2017). "Alterations of consciousness and mystical-type experiences after acute LSD in humans". Psychopharmacology. 234 (9–10): 1499–1510.
8. Gershon L (July 19, 2016). "How LSD Went From Research to Religion". JSTOR Daily. Archived from the original on January 28, 2021. Retrieved July 14, 2018.
9. Appel JB, Whitehead WE, Freedman DX (July 1968). "Motivation and the behavioral effects of LSD". Psychonomic Science. 12 (7): 305–306.
10. Commonly Abused Drugs Charts". National Institute on Drug Abuse. July 2, 2018. Archived from the original on March 1, 2020. Retrieved July 14, 2018.

DRUG ADDICTION AND ABUSE AMONG YOUTH

Smt B Krupa Karuna Vani, Lecturer in Chemistry, SKR GDC, Gudur, Tirupathi District.

Drug addiction is a worldwide problem. It is mostly seen among youth. Many young people have become dependent on different type of substances that have narcotic effect on them. Drugs spoil every aspect of life of youth. They disconnect with their families and live in their own worlds. They spend lots of money on buying drugs. They even get ready to earn the money illegally so they can buy drugs. There are so many health problems that comes with addicting to drugs. The most disturbing part about drugs is thousands of people are getting addicted to drugs, and the awareness that's been there is obviously not enough to stop them. Cocaine, meth,marijuana,crack,heroin etc are the street drugs that are most commonly used and easily available drugs. Heroine is the drug which is very dangerous that has the ability to malfunction the heart. Drug consumption has detrimental effect on society. Personal and family issues also lead to drug addiction in youth. When the people (mostly youth) fail to deal with the personal issues they turn towards drugs to escape from the ache that's been caused due to personal problems. The physiological effects of drug addiction can be difficult to endure and this is why the addict must be given treatment. thing is drug addictions are seen in every country of the world. The term drug not only means medicine but fatal narcotics with different specifications. These drugs have their evil effects on mind and body cells of addicts. The addict becomes dependent on the drug to a great extent that he or she cannot stop using it. Despite of having full knowledge of its effects on health addicts use it on regular basis.

SYMPTOMS OF DRUG ADDICTION

The most common symptoms of drug addiction are ---- obsession with a particular substance, loss of control over the usage of drugs, abandoning the activities which you used to enjoy. Drug addiction may have long term impact on life and one may develop severe symptoms such as fatigue, chills, insomnia, depression, anxiety, trembling, headache, behavior changes, dilated pupils, sweating, poor coordination problems, nausea etc. High stress levels, social pressure, mental health conditions, psychological trauma, exposure to drug abuse these are the main causes of drug addictions. One should consult someone to take enough guidance if facing any of the above mentioned conditions. So that they can save themselves from the addiction. Awareness should be given to everyone starting from schools on how to deal with these issues.

PREVENTION OF DRUG ADDICTION

As we all know prevention is always better than cure. It is always the best option to deter people from drug abuse. Though it is practically impossible to prevent every single person from the addiction, there are few things we can do to prevent drug addiction.

DEALING WITH THE PEER PRESSURE

The biggest reason why people start using is because of their friends or colleagues who utilize per pressure. No one in this would like to be left out especially teens and youngsters. If you are in such situations you should find a better group of friends who will not pressure you into harmful things. You should plan ahead of time or prepare a good excuse to stay away from tempting situation.

TREAT EMOTIONAL ILLNESS

Individuals suffering with any mental condition such as anxiety depression post traumatic stress etc. should seek help from a physiatrist. There is a strong connection between mental illness and drug addiction. Those with weak emotional status may easily turn to drugs.

LEARN TO DEAL WITH PRESSURE

People of today generation are overworked and often feel like taking a good break. However they make the mistake of turning to drugs and end up making life more stressful. Many of us fail to recognize this. The best way is to find other ways to handle stress. Whether it is taking up exercising or reading a good book you should try positive things that help in relieving stress.

UNDERSTANDING THE RISK FACTORS

If you are not aware of the risk factors of drug addiction you should first know about the drug abuse. Individuals who are aware of the physical and emotional effects of drug addiction are likely to overcome them. People take up drugs when something in their life is not going well and unhappy about their life. One should always look at the big picture and focus on priorities instead od worrying short term goals.

DEVELOPING HEALTHY HABITS

Eating a well balanced diet and doing regular exercise is the best way to prevent drug addiction. A healthy body makes it easier for people to deal with stress and handle life effectively which eventually reduces the temptation to use drugs. The above tips are just a few ideas that can help prevent drug addiction. However if the person has prevent drug addiction he or she seek drug detox treatment at the earliest.

TREATMENT OF DRUG ADDICTION

Drug addiction can be manages effectively like other chronic diseases such as diabetes heart disease asthma etc. Treatment of drug addiction is become personalized. The comprehensive treatment options not only address addiction, but treat the underlying issues resulting in addiction. Though there are many options to treat drug addiction it is not easy. Drug addiction is a chronic disease and one cannot stop using drugs within a few days. A lot of patients need long term or repeated care to stop using drugs completely. Drug addiction treatment depends on severity of drug abuse. The treatment must stop the person from using drugs as well keep him away from drugs.

NATIONAL SEMINAR ON DRUG ADDICTION AND ABUSE AMONG YOUTH

978-93-5967-634-0

SKR GOVERNMENT DEGREE COLLEGE, GUDUR, TIRUPATI DT.AP.,