Estimado lector:

En este número les presentamos una serie de estudios de los efectos de diferentes Drogas en el cerebro, tales como la Ritalina, la metanfetamina, heroína y el tabaco.

Además se presenta un interesante artículo sobre los sistemas de entrega utilizados por los drogodependientes que puede ser de gran utilidad para el desarrollo de habilidades de concientización y reconocimiento que permitan ayudar a combatir el abuso de drogas y la adicción.

Incluimos también, entre otros, un par de estudios sobre drogadicción realizados en Irán, que se enfocan en el impacto que esta enfermedad tiene sobre la calidad de la vida familiar, así como su relación e impacto según el género, edad y estatus residencial.

Esperamos que, pese a la barrera del idioma, el material aquí presentado sea de su total interés y provecho.
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Does Exercise Deprivation Increase the Tendency Towards Morphine Dependence in Rats?


Exercise deprivation has been concluded to have some negative effects on psychological well-being. This study was conducted to find out whether exercise deprivation may lead to morphine dependence in rats.

Background: Forty male Wistar rats weighing 162 ± 9 g were housed in clear plastic cages in groups of two under standard laboratory conditions. The study had two phases. In phase I, the animals were randomly divided into exercised (E) and unexercised (UE) groups (n = 20 each) and treadmill running was performed based on a standard protocol for three weeks. At the end of the training period, plasma β-endorphin levels were determined in four rats from each group. In phase II, the animals were provided with two bottles, one containing tap water and the other 25 mg/l morphine sulfate in tap water for a total of 12 weeks. At the end of this phase naloxone was injected intraperitoneally to precipitate morphine withdrawal.

Methods: There was no significant difference between UE and E groups in morphine consumption (mg/kg/wk) [group: F(1,14) = 0.2, P = 0.690; time: F(11,154) = 18.72, P < 0.001; interaction: F(11,154) = 1.27 , P = 0.245]. No statistically significant difference between the two groups of animals was seen regarding withdrawal signs.

Findings: The study showed that discontinuation of exercise does not increase the tendency of morphine dependence in rats.

Drug Delivery Methods Ranking Addiction Potential


ABSTRACT: Substance abusers and drug addicts generally seek the fastest and most effective methods of getting high this means that drug delivery methods are important to users, and typically an addict will prefer one method over another. However, because there are a wide variety of drug delivery methods, substance abusers will often fluctuate between these techniques when the need arises. Understanding the different ways that people use drugs can aid in creating awareness and recognition skills to help combat drug abuse and addiction.
Knowledge of Dentistry, Medicine, and Pharmacy Students about Psychedelic Drugs in Kerman University of Medical Science

http://ahj.kmu.ac.ir/index.php/ahj/article/download/26/16

Psychedelic drugs can cause one to get out of normal status and permanent cerebral defects, via affecting central nervous system. Consumption of these drugs seems to be increasing nowadays especially among the youth and university educated population. We conducted a study to evaluate the awareness of medical science students of Kerman University of medical science who are going to be the future medical population.

Background: This cross-sectional study was carried out on 471 of students of medicine, dentistry and pharmacy which were in the first to forth year of their education about psychedelic drugs (Ecstasy, LSD, Ice, crack and Yaba). To evaluate the students’ awareness of drugs we used questionnaire with reliability and validity proven via pilot study. Statistics analysis was performed using SPSS13 software.

Methods: Average of their age was 3.2 ± 20.4. Overall among the students, 56.7% were in the low level of insight, 34.3% in medium and 6.9% in good level and 2.2% had best insight of the drugs. Also only 32.2% of students had the full information about the name of drug, 25.7% had information about the form of them, 24% about the addiction with them, 7% about their complication and only 5% about the origin of drugs. The information about all psychedelic drugs was higher among pharmacy students, students of the third year and males.

Findings: Our study showed a low insight about psychedelic drugs like Ecstasy, LSD, Ice, Crack, and Yaba among the students. According to this lack of information of these groups, it is suggested that educational courses about the complication, signs and symptoms of these drugs be held.

Study of Addiction in the Family and its Impact on the Quality of Family Life from the Women Point of View


Addiction, because of its progressive nature in all aspects of life, is considered as a health hazard and its adverse effects are visible in mental, physical, social, emotional, spiritual and cognitive health of people in the family and community. This study shows the relationship between addiction in family and quality of life in Iranian families and in this respect addiction was considered as the independent variables and quality of life was the dependent variable. The research method used in this study includes library and survey methods which collected information and data by questionnaires techniques. Statistical population in this study include 200 wives of addict people in three drug addiction centers in Tehran district 11 who voluntarily cooperated and were questioned through Nonprobability Sampling method. Results showed that the main hypothesis of the study is confirmed, which indicates that there is a significant relationship between addiction in family and quality of life, from the perspective of women in Iranian society.
A social work study on the impact of age, gender and residential status on drug addiction


Abstract

Drug addiction is one of the most important issues in developing countries and it has become a serious issue, which has impacted social health, significantly. In this paper, we study the relationship between age, gender and residential status with drug addiction. The study chooses a sample of 900 people where 450 were female, 450 were male, and all the residence lived in province of Esfahan, Iran. In our survey, two third of the surveyed people were living in cities and only one third of the surveyed people were residing in rural areas. The results of our survey have indicated that there were some positive relationship between age and addiction to drugs and between gender and addiction to drugs (Sig=0.04). In other words, older people will more likely to go for drug addiction. In addition, men tend to get addicted more than women do (Sig=0.03). However, there is no evidence to believe that residential status had any impact on addiction to drugs.

Neuroadaptive Changes Associated with Smoking: Structural and Functional Neural Changes in Nicotine Dependence


Abstract: Tobacco smoking is the most frequent form of substance abuse. We provide a review of the neuroadaptive changes evidenced in human smokers with regard to the current neurobiological models of addiction. Addiction is thought to result from an interplay between positive and negative reinforcement. Positive reinforcing effects of the drugs are mediated by striatal dopamine release, while negative reinforcement involves the relief of withdrawal symptoms and neurobiological stress systems. In addition, drug-related stimuli are attributed with excessive motivational value and are thought to exert a control on the behavior. This mechanism plays a central role in drug maintenance and relapse. Further neuroadaptive changes associated with chronic use of the drug consist of reduced responses to natural rewards and in the activation of an antireward system, related to neurobiological stress systems. Reduced inhibitory cognitive control is believed to support the development and the maintenance of addiction. The findings observed in human nicotine dependence are generally in line with these models. The current state of the research indicates specific neuroadaptive changes associated with nicotine addiction that need to be further elucidated with regard to their role in the treatment of nicotine dependence.
Long-Term Effects of Chronic Oral Ritalin Administration on Cognitive and Neural Development in Adolescent Wistar Kyoto Rats


Abstract: The diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) often results in chronic treatment with psychostimulants such as methylphenidate (MPH, Ritalin®). With increases in misdiagnosis of ADHD, children may be inappropriately exposed to chronic psychostimulant treatment during development. The aim of this study was to assess the effect of chronic Ritalin treatment on cognitive and neural development in misdiagnosed “normal” (Wistar Kyoto, WKY) rats and in Spontaneously Hypertensive Rats (SHR), a model of ADHD. Adolescent male animals were treated for four weeks with oral Ritalin® (2 × 2 mg/kg/day) or distilled water (dH2O). The effect of chronic treatment on delayed reinforcement tasks (DRT) and tyrosine hydroxylase immunoreactivity (TH-ir) in the prefrontal cortex was assessed. Two weeks following chronic treatment, WKY rats previously exposed to MPH chose the delayed reinforcer significantly less than the dH2O treated controls in both the DRT and extinction task. MPH treatment did not significantly alter cognitive performance in the SHR. TH-ir in the infralimbic cortex was significantly altered by age and behavioural experience in WKY and SHR, however this effect was not evident in WKY rats treated with MPH. These results suggest that chronic treatment with MPH throughout adolescence in “normal” WKY rats increased impulsive choice and altered catecholamine development when compared to vehicle controls.

Functional and Structural Brain Changes Associated with Methamphetamine Abuse


Abstract: Methamphetamine (MA) is a potent psychostimulant drug whose abuse has become a global epidemic in recent years. Firstly, this review article briefly discusses the epidemiology and clinical pharmacology of methamphetamine dependence. Secondly, the article reviews relevant animal literature modeling methamphetamine dependence and discusses possible mechanisms of methamphetamine-induced neurotoxicity. Thirdly, it provides a critical review of functional and structural neuroimaging studies in human MA abusers; including positron emission tomography (PET) and functional and structural magnetic resonance imaging (MRI). The effect of abstinence from methamphetamine, both short- and long-term within the context of these studies is also reviewed.
Repeated Episodes of Heroin Cause Enduring Alterations of Circadian Activity in Protracted Abstinence


Abstract: Opiate withdrawal is followed by a protracted abstinence syndrome consisting of craving and physiological changes. However, few studies have been dedicated to both the characterization and understanding of these long-term alterations in post-dependent subjects. The aim of the present study was to develop an opiate dependence model, which induces long-lasting behavioral changes in abstinent rats. Here, we first compared the effects of several protocols for the induction of opiate dependence (morphine pellets, repeated morphine or heroin injections) on the subsequent response to heroin challenges (0.25 mg/kg) at different time points during abstinence (3, 6, 9 and 18 weeks). In a second set of experiments, rats were exposed to increasing doses of heroin and subsequently monitored for general circadian activity up to 20 weeks of abstinence. Results show that heroin injections rather than the other methods of opiate administration have long-term consequences on rats’ sensitivity to heroin with its psychostimulant effects persisting up to 18 weeks of abstinence. Moreover, intermittent episodes of heroin dependence rather than a single exposure produce enduring alteration of the basal circadian activity both upon heroin cessation and protracted abstinence. Altogether, these findings suggest that the induction of heroin dependence through intermittent increasing heroin injections is the optimal method to model long-term behavioral alterations during protracted abstinence in rats. This animal model would be useful in further characterizing long-lasting changes in post-dependent subjects to help understand the prolonged vulnerability to relapse.

Early Life Adversity Alters the Developmental Profiles of Addiction-Related Prefrontal Cortex Circuitry


Abstract: Early adverse experience is a well-known risk factor for addictive behaviors later in life. Drug addiction typically manifests during adolescence in parallel with the later-developing prefrontal cortex (PFC). While it has been shown that dopaminergic modulation within the PFC is involved in addiction-like behaviors, little is known about how early adversity modulates its development. Here, we report that maternal separation stress (4 h per day between postnatal days 2–20) alters the development of the prelimbic PFC. Immunofluorescence and confocal microscopy revealed differences between maternally-separated and control rats in dopamine D1 and D2 receptor expression during adolescence, and specifically the expression of these receptors on projection neurons. In control animals, D1 and D2 receptors were transiently increased on all glutamatergic projection neurons, as well as specifically on PFC→nucleus accumbens projection neurons (identified with retrograde tracer). Maternal separation exacerbated the adolescent peak in D1 expression and blunted the adolescent peak in D2 expression on projection neurons overall. However, neurons retrogradely traced from the accumbens expressed lower levels of D1 during adolescence after maternal separation, compared to controls. Our findings reveal microcircuitry-specific changes caused by early life adversity that could help explain heightened vulnerability to drug addiction during adolescence.
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