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Editorial

Drug Tolerance in Pharmacology

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EDITORIAL

When addressing drug abuse and the use of prescription drugs such as opioid painkillers, it is important to consider the significance of the words tolerance, dependency, and addiction. Unfortunately, these words are sometimes misused by both practitioners and laymen, contributing to the misguided assumption that tolerance, dependency, and addiction are just distinct names for the same thing. Knowing the difference between these words, however, will result in a clearer understanding of the risks of substance addiction. The most noticeable difference between both terms is that the physical effects of drug use relate to tolerance and dependency.

Drug tolerance is a pharmacological term which describes the reduced reaction of subjects to a drug after its repeated use. Increasing its dosage can re-enhance the effects of the drug. This can, however, accelerate tolerance, further reducing the effects of the drug. Drug tolerance is predictive of drug use, but drug dependency or addiction is not inherently associated with it. The method of development of tolerance is reversible (e.g., by a drug holiday) and can include both physiological and psychological influences. Drugs that contribute to the growth of tolerance and physical dependency also have the ability, but not always, to cause addiction.

CLASSIFICATION

Pharmacodynamic Tolerance: With regular use, pharmacodynamic tolerance starts when the cellular reaction to a drug is decreased. Large concentrations of a drug continuously binding to the receptor are a common cause of pharmacodynamic tolerance, desensitising it by repeated contact. Other possibilities include a drop in receptor density (usually related to receptor agonists) or other mechanisms that contribute to changes in the possible firing rate of action. The opposite, i.e., increased receptor firing rate, an increase in receptor density, or other mechanisms, includes pharmacodynamic tolerance to a receptor antagonist. While most occurrences of pharmacodynamic tolerance occur after sustained exposure to a drug, instances of acute or instant tolerance (tachyphylaxis) can occur.

Pharmacokinetic (metabolic) tolerance: The absorption, delivery, metabolism and excretion of drugs refers to pharmacokinetics (ADME) All psychoactive substances are first ingested into the bloodstream, transported to different parts of the body in the blood, including the place of action (distribution), broken down in some way (metabolism), and gradually eliminated from the body (excretion) All of these factors, including its efficacy, side effects, and duration of action, are very important determinants of the essential pharmacological properties of a drug. Due to a reduced volume of the drug reaching the site, pharmacokinetic resistance (dispositional tolerance) exists because it affects This could be caused by an increase in the induction of enzymes, such as CYP450 enzymes, necessary for the degradation of the drug. With oral absorption, this form of tolerance is most apparent, since other drug administration routes bypass first-pass metabolism.

Behavioral tolerance: Behavioral tolerance occurs with the use of some psychoactive drugs, where, with prolonged use, tolerance to a behavioral effect of a medication, such as increased methamphetamine motor activity, occurs. It can occur through drug-independent learning or as a form of brain pharmacodynamic tolerance; as one learns how to consciously resolve drug-induced disability by practice, the former behavioral tolerance mechanism occurs. Behavioral tolerance is also context-dependent, meaning tolerance depends not on the medication itself, but on the atmosphere in which the drug is administered.

Withdrawal: Some individuals can begin to notice very painful issues when they avoid using drugs when it comes to substance addiction. Withdrawal is the aspect of drug addiction that occurs when a person is no longer using it, but their bodies have become used to routinely taking certain drugs. Based on a few different variables, the symptoms that happen in withdrawal can vary. These include what drugs they used and how much they used them. Some symptoms of withdrawal that are typical include dizziness, vomiting, sleeplessness, Fear, Hallucinations, Depression, Sweats, Panic attacks.

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