**Virginia R Post to week 3 discussion 1**

**Issues Behind Addictive Drug Use**

Psychoactive drugs have been used for centuries.  However, today drugs are considered a public health crisis.  Drugs like opium or cocaine were even considered appropriate for medicinal use.  Today, this notion seems laughable; except in their controlled and chemically altered forms, they still are. “Thanks to increased chemical and drug development in the 20th century, more drugs with abuse potential became available” (American Addiction Centers, 2019, para. 8). Based on our literature, humanity has tampering with these substance structures in the last century to duplicate and enhance their psychoactive properties (Advokat et. al, 2018) This is likely a significant catalyst of drug abuse and addition becoming more prevalent.

**Cocaine**

Cocaine is a stimulant found in the leaves of the Erythroxylon coca plant, commonly found in South America. Dating back 5000 years, the indigenous would chew the leaves to reduce fatigue, thirst, and hunger by its mechanism of blocking dopamine re-uptake. The a daily dose used by the indigenous was about 200 milligrams.  Once economic trade was brought to the region, people found ways to preserve the drug’s psychoactive effects since the potency of the leaves was not sustained long after harvest.  These leaves were soaked and mashed to extract the cocaine in the form of a paste, and was then treated with hydrochloric acid. Another alteration to the drug involved mixing cocaine hydrochloride with baking soda and water, then heating until cocaine crystals precipitate. This version became known as crack cocaine. One leave of the E. coca contains only one percent cocaine.  The coca paste has roughly 60-80 percent cocaine. The Cocaine hydrochloride, typically absorbed through snorting provides a dose of 25 milligrams, and a user may sniff 50-100 milligrams at a time.  The “crack” version, which can be smoked, provides doses of 250 milligrams – 1 gram (Advokat et. al, 2018).  Chewing the coca leaves may seem like a large dose, but the 200 milligrams are a daily dose measure.  It also has a “high” duration that is twice as long as cocaine hydrochloride (45-90 min vs. 30-45 min).  The shorter duration of Cocain hydrochloride and crack cocaine prompts more frequent use in a shorter amount of time.

**Psychedelics**

Various types of psychedelic drugs were also used in ceremonies and thought to be a conduit to the Gods or spiritual realm. Many drugs in this category does not have a reinforcing effect, and therefore, less likely to be abused. Categories of psychedelics include: anticholinergic, monoaminergic, glutamatergic NMDA receptor antagonists, and the opioid kappa receptor agonist.  Scopolamine, an anticholinergic substance, can produce restlessness, excitement, hallucinations, euphoria, and disorientation typically associated with psychedelics.  However, it also clouds the consciousness and causes memory loss; making it less popular for abuse.  Monoaminergic psychedelics interact with amine neurotransmitters, such as serotonin (5-HT), dopamine, and norepinephrine; which do have the potential of producing a reinforcing effect (Advokat et. al, 2018). However, psychedelics in their base form have had caused minor harm to users. “According to analyses of data obtained from the U.S. National Survey on Drug Use and Health (NSDUH) covering the years 2008 to 2012, people who used any of the three psychedelics drugs—LSD, psilocybin, and mescaline—were not at risk of developing symptoms of mental health problems” (Advokat et. al, 2018, pg. 257).  The more these compounds are tampered with or recreated, however, potency increases to lethal consequences. The German pharmaceutical company E. Merck developed methylenedioxymethamphetamine, best known as ecstasy, which is a prototype catecholamine psychedelic.  Because of its potency, the use of Ecstasy has been associated with tachycardia, convulsions, rigidity, breakdown of skeletal muscle, kidney failure, cardiac arrhythmias, and death (Advokat et. al, 2018).  Clearly since the science did not exist thousands, or even hundreds, of years ago to significantly increase the potency of psychedelics, these substances were likely not thought of as the threat to society as they are today. While overuse of many psychedelics may cause unpleasant reactions, these effects were mostly temporary and rarely resulted in death – accept perhaps, by accident.

**Marijuana**

As with some psychedelics, marijuana may cause some unpleasant experiences depending on dose.  It can cause a decrease in motor skills, which may carry social consequences, injury, or death if operating a vehicle or heavy machinery.  But the drug itself is generally harmless. Its active ingredient, THC, is a partial agonist at CB1 and CB2 receptors. Ironically, the second chemical found in Marijuana, CBD, is thought to be a CB2 antagonist – likely limiting the effect of the THC depending on ratio. CBD is also thought to be a serotonin 1A agonist.  CBD also affects the endogenous cannabinoids (eCB) - thought to influence addictive vulnerability. CBD is now thought to be a potential treatment option for a variety of conditions. However, marijuana continues to remain a schedule I drug classification; making possession of it carry significant legal consequences. Though the attitudes about marijuana is changing, the US federal government is slow to relent its position.  Because the metabolism of this drug remains it fatty tissue, its use is also easily detected in urine tests (Advokat et. al, 2018).  This increases the risk of being caught using it, and suffering legal consequences or loss of employment.   Unfortunately, this also lead to the creation of synthetic marijuana substances (K-2 or Spice).  The appeal of synthetic cannabinoid substances was its ability to produce the marijuana/psychedelic-like effects without being detectable in a urine sample.  Now, despite synthetic cannabinoids being classified as a schedule I drug, the ingredients can be easily changed and – as mentioned – it cannot be easily detected (Advokat et. al, 2018).  However, synthetic cannabinoids are far more dangerous than the cannabis plant drug it was modeled to mimic.  Clinical reactions to SC use has included acute kidney injury, seizures, psychosis, cardiotoxic effects, coma and death; and these deaths have ranged in people that are 13-56 years of age (Advokat et. al, 2018).  Once again, chemical tampering and synthetic reproduction of a naturally occurring drug has increased its lethality.

**Risk/Benefits**

I do NOT allege that these drugs were completely harmless to people before scientific tampering – but the harm they did cause to those who abused them was likely less alarming. And the scientific tampering has also produced drugs that have had a positive effect in medicine – such as anesthesia.  Amphetamines, synthesized from the ma-huang herb, are used to treat ADHD and narcolepsy.  Narcotics, synthesized from the poppy flower and similar to heroin, are used to treat intense pain.  However, despite its medical uses, narcotics and amphetamines are highly subject to be abused. Both also have dangerous side effects with prolonged use.  Narcotics depress respiratory function and damage the liver (Advokat et. al, 2018).  If a patient suffers from a respiratory condition, the risk will likely outweigh the benefit for pain relief.  If a patient has a history of stimulant abuse, prescribing Amphetamines may not be the best option; at least without proper monitoring or supervision. Considering the stimulatory effects, if a patient is high risk for adverse cardiac events or has an underlying cardiac condition, prescribing amphetamines presents an even higher risk for triggering cardiac arrest and/or death.  There have been recent studies to explore the medicinal properties for cocaine, marijuana and LSD.   Succinyl Norcocaine is a cocaine derivative in a vaccine that can treat cocaine addiction. As discussed, marijuana and its various strains, have been shown to replace or reduce the need for the more toxic amphetamines and narcotics.  LSD is currently showing promise as a potential treatment for PTSD (Advokat et. al, 2018). Marijuana and LSD have been shown to be less deadly than many of the prescription medication already in use.  However, a complete evaluation of patient health, medical history, and medications will still be necessary to ensure the benefit of eventually prescribing these drugs will out way all risks.

Resources:

Advokat, C. D., Comaty, J. E., & Julien, R. M. (2018). Julien's primer of drug action: A comprehensive guide to the actions, uses, and side effects of psychoactive drugs (14th ed.). Retrieved from [https://vitalsource.com (Links to an external site.)](https://vitalsource.com/)

American Addiction Centers Editorial Staff (2019, June 11). The History of Drug Abuse and Addiction Rehabilitation. Retrieved November 19, 2020, from [https://drugabuse.com/addiction/history-drug-abuse/ (Links to an external site.)](https://drugabuse.com/addiction/history-drug-abuse/)