The Genetic Influences on Opiate Addiction

Anne Sielschott
anne.sielschott@otterbein.edu

Follow this and additional works at: https://digitalcommons.otterbein.edu/stu_msn

Recommended Citation
Sielschott, Anne, "The Genetic Influences on Opiate Addiction" (2017). Nursing Student Class Projects (Formerly MSN). 265.
https://digitalcommons.otterbein.edu/stu_msn/265
The Genetic Influences on Opiate Addiction
Anne Sliedsholm, RN, BSN
Otterbein University, Westerville, Ohio

Introduction

The effects of addiction and the present opioid crisis can not only be felt at the individual level of the addict but throughout all aspects of society. From the infant born addicted to heroin, to the family member begging their loved ones to make a change, to the medical personnel with the responsibility of caring for those with drug seeking or violent behavior needing their next fix, the drug problem in America is one that can no longer be ignored. The number of unintentional drug overdoses in Ohio has grown from 411 in 2010 to a staggering 3055 in 2015, currently averaging 8 deaths per day in the state of Ohio (Kreos, et al., 2017). It is the responsibility of medical personnel to not only be aware of the statistics and trends regarding this crisis, but to also be knowledgeable and up-to date on the current research regarding what makes an individual an addict. What differences exist, for example, between Jimmy and Sally following the same treatment for heroin addiction while Sally’s battle will last longer and be more difficult? Part of the reason behind the genetic influences of addiction are understood, much research is being completed to discover the gene’s role, and how these could provide a more accurate diagnosis and functional assessment. The models will aid the provider in the recognition of the problem and the development of a treatment plan. The Genetic Influences

Phenotypic Presentation

Opiate addiction is defined as a chronic relapsing disease characterized by a significant degree of compulsive drug seeking behavior (Koob, 2008). Opiates are addictive because their interaction with specific receptors in the brain’s reward center is known to cause pleasurable effects, such as euphoria, excitement, and relaxation, making the desire for more drug and the desire to use it again stronger. This positive feedback loop continues to create a cycle of drug-seeking behavior. The dopamine release and dopamine receptor activation are thought to be fundamental in the development of addiction and its associated problems (Rauschent, Bonci, & Bawor, 2014). DRD4, the dopamine receptor 4, is a receptor that has been extensively studied. DRD4 deletion variants have been associated with increased sensitivity to the rewarding properties of drugs (Kalu, et al., 2014). These dopamine receptors have a high affinity for opioids, which are the most commonly abused substances in the United States. Opioids have a high potential for abuse and addiction, and members of the opioid receptor family include 

• Opioid receptors, which are responsible for欣]
• Dopamine receptors, which are responsible for欣]
• Serotonin receptors, which are responsible for欣]

While all three types of receptors are present in the brain, the nucleus accumbens, provide the “high” that is sought by addicts. Opiates increase the availability of dopamine and increase the activity of the mesolimbic system. This results in the 11βG allele. Increased sensitivity to pain and a decreased response to opioid treatment are associated with this genetic variation. Despite those with this variant habits have not participated with the 11βG allele request higher doses of opiates for treatment of pain (Kreos, et al., 2012). Dopamine is a powerful neurotransmitter, responsible for the positive rewards seen with things such as finishing a full meal, sexual encounters, and receiving an award. The use of opiates creates a large amount of dopamine to be released into the “rewards” pathway within the brain, the nucleus accumbens, providing the “high” that is sought by addicts. Opiates act in the mesolimbic system, increasing the activity of the nucleus accumbens. Opiates also increase the activation of CREB, which is known to increase the drive for drug use. CREB increases the drive for drug use by increasing the transcription of a gene called ΔFosB, which is known to increase the drive for drug use. CREB increases the drive for drug use by increasing the transcription of a gene called ΔFosB, which is known to increase the drive for drug use. CREB increases the drive for drug use by increasing the transcription of a gene called ΔFosB, which is known to increase the drive for drug use. CREB increases the drive for drug use by increasing the transcription of a gene called ΔFosB, which is known to increase the drive for drug use. CREB increases the drive for drug use by increasing the transcription of a gene called ΔFosB, which is known to increase the drive for drug use.