Chapter 24
Pleasure Spectrum Syndromes (Substance Use/Abuse, Addictions to Substances and Beliefs, Fanaticism)

Contents

24.1 Gene × Meme Interaction, Evolutionary Adaptation, and Syndromes

Pleasure is the motivation for all living activity. Volitional action actively seeks pleasure and avoids unpleasure; nonvolitional autonomic dysfunction may cause unpleasure, which then stimulates the organism to correct the dysfunction.

For humans, there are certain activities that predictably produce pleasure, e.g., a good meal, good company, love, sex, good exercise, engaging in favorite hobbies. The emotion of pleasure seems associated with the dopaminergic activation of the medial forebrain bundle, the ascending mesolimbic ventral tegmental pathway and nucleus accumbens (see Chapter 12).

The dopaminergic and endorphinergic reward pathways of the brain are critical for survival since they provide the pleasure drives for eating, love, and reproduction; these are called "natural rewards" and involve the release of dopamine in the nucleus accumbens and frontal lobes (Comings and Blum, 2000).

Dopamine D2 receptor especially has been implicated in pleasure and reward mechanisms. Pleasure seems to be the net effect of neurotransmitter interaction at the mesolimbic brain region when dopamine is released from the neuron at the nucleus accumbens and interacts with a dopamine D2 receptor. "The reward cascade" involves the release of serotonin, which in turn at the hypothalamus stimulates enkephalin, which in turn inhibits GABA at the substantia nigra, which in turn fine tunes the amount of dopamine released at the nucleus accumbens ("reward site"). This normal mechanism of pleasure works well in most of us.

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When dopamine is released into the synapse, it stimulates a number of dopamine receptors (D1–D5) which results in increased feelings of well-being and reduced stress.

Release of dopamine and the sensations of pleasure can be produced by "unnatural rewards" such as alcohol, cocaine, methamphetamine, heroin, nicotine, marijuana, and other drugs, and by compulsive activities such as gambling, eating, and sex, and by risk taking behaviors. Since only a minority of individuals become addicted to these substances or behaviors, genetic and epigenetic factors play an important role in such vulnerabilities (Margaron, 2004).

When there is a dysfunction of the brain reward cascade often as a result of genetically influenced hypodopaminergic state, the brain may compensate for the lack of pleasure by seeking an external source of dopaminergic stimulation – e.g., drugs. This may result in multiple drug-seeking behavior as alcohol, cocaine, heroin, marijuana, nicotine, and glucose all cause activation and neuronal release of brain dopamine. Carriers of the DRD2 receptor gene Taq I A1 allele have compromised dopamine D2 receptors and a high risk for multiple addictive, impulsive, and compulsive behavioral propensities, such as severe alcoholism, cocaine, heroin, marijuana and nicotine use, glucose bingeing, pathological gambling, sex addiction, ADHD, Tourette's syndrome, autism, chronic violence, posttraumatic stress disorder, schizoid/avoidant cluster, conduct disorder and antisocial behavior. Blum proposed the term, "reward-deficiency syndrome," to describe the hypodopaminergic trait resulting in the breakdown of the reward cascade due to both multiple genes and environmental stimuli and resultant aberrant behaviors (Blum et al., 2000; Comings and Blum, 2000).

The pursuit of pleasure has obvious value to the organism, i.e., genes. When memes arose, they provided a shortcut for pleasure as imitation of successful behaviors, such as cracking open a shell, was more efficient than trial and error. As memes evolved, they tended to attach themselves to the pleasure-reward mechanism as this is a sure way of ensuring replication. For example, one tends to dwell on pleasant thoughts and memories, and tends to communicate (replicate and spread) them. Eventually, some memes co-opted the pleasure mechanism for their own propagation regardless of the welfare of the genes.

As memes in the brain are sophisticated neuronal connections, they are capable of eliciting subtly different pleasures as in sophisticated cooking. Thus, certain types of meditation or asceticism may produce a different kind of "high" while disavowing ordinary pleasures of life.

Some memes became experts in creating dopamine "high's" to the point of addiction, often at the expense of the genetic needs of the individual, as in gambling and in religious experiences (Comings et al., 2000; Previc, 2006). This may be particularly facilitated in conditions of dissociation (see Chapter 23). In religious fanaticism, the search for this dopamine high may result in killing of the self and/or others (e.g., suicide bombing). Religious memes also attached themselves to the fear-anxiety system of the brain – fear of eternal damnation and suffering. Thus armed with the brain mechanisms of ecstasy and terror, religions suppressed the memes geared to the interests of genes, such as reasoning, and engaged in religious wars for centuries.

Inability to feel pleasure, anhedonia, is often seen in depression and schizophrenia and represents a hypodopaminergic state, usually a result of gene × meme interaction. Memes of painful experiences, fear and anxiety, hopelessness, etc., may all contribute to the blockage of the reward-pleasure system.

In summary, pleasure spectrum disorders represent a dopamine system dysregulation caused by gene × meme interaction. Addictions may occur in individuals with a hypodopaminergic reward-deficiency syndrome. Imitating others getting high with drugs (meme) may be an important component in addictions as well as in religious fanaticism.

Syndromes. Why does the pursuit of pleasure (and reward) become problematic? Is not *everything* we do for pursuit of pleasure?

We may say that if the pleasurable activity does not serve the long-term well-being of the organism or of the society, then it is a problem. Obviously, this statement is meme-driven. From the genetic point of view, any pleasurable activity is evolutionarily driven to be adaptive. Considering whether an activity is good or bad in the long run is a product of memetic processing as are considerations of whether it is good or bad for the society. What I am saying here is that, unlike anxiety-mood spectrum syndromes and attention-cognition spectrum syndromes, pleasure spectrum disorders, with the exception of anhedonia, do not involve immediate gene-mediated suffering but are defined as problematic memetically, i.e., meme-defined disorders. We have seen, nevertheless, that gene × meme interaction is important in causing the hypodopaminergic state that probably underlies many serious addictions.

24.1.1 Substance Use/Abuse

We rely on substances for living – food, water, air. Substances derived from plants and animals have been used since time immemorial in the hopes of relieving pain, obtaining an energy boost, as an aphrodisiac, etc. Some of the substances used in herbal medicine are poisonous in large quantities, but then all prescription drugs we use are poisonous in large quantities. Indians in Peru have chewed on coca leaves for centuries without any ill effects or social taboo, and smoking or ingesting marijuana (bhang) has been widely accepted in India and other parts of Southeast Asia since at least 2000 BCE.

Of course, cocaine and marijuana are illegal substances in the United States, and thus their use is considered problematic though there is no evidence that moderate use causes any harm to the adult organism. Alcohol and tobacco, on the other hand, are legal, but they can be quite addicting, and tobacco in particular is not only highly addicting but is known to be detrimental to physical health in a dose dependent fashion. Caffeine is, of course, legal and widely used for its stimulant effect, but can cause anxiety symptoms, insomnia, and sympathetic hyperarousal if used excessively.

Psychotomemetic substances such as LSD and peyote, and designer drugs such as MDMA (3,4-methylenedioxy-*N*-methylamphetamine, "ecstasy") are illegal

substances and thus a problem even if used moderately. On the other hand, the "date rape" drug GHB (gamma-hydroxybutyric acid, "liquid ecstasy," "liquid G") is illegal (schedule I) except when prescribed for cataplexy and narcolepsy as xyrem (schedule III). Prescription drugs are legal unless used illegally, i.e., without prescription for the individual using it. All these substances have in common the fact that they are defined as problems by the society memetically rather than because they are inherently problematic.

24.1.2 Addictions to Substances and Beliefs, Fanaticism

Addiction can be to substances (e.g., alcohol, narcotics, stimulants) or memeplexes that may combine belief and behavior, including rituals (e.g., artistic endeavor, gambling, religion, fanaticism). Addiction represents an extreme of pleasure seeking behavior where the degree of pleasure achieved through the substance or activity (or the unpleasure without it) far outweighs considerations for other genetic and memetic needs of the organism. If an addicted individual is deprived of the addictive substance or activity, there results a state of severe unpleasure representing sudden dopamine withdrawal in the pleasure areas of the CNS discussed above. This may be further augmented by the physiologic withdrawal reactions to the addictive substances themselves, such as alcohol withdrawal and cocaine withdrawal.

As discussed earlier in the chapter, genetic polymorphisms interacting with early environment may contribute to a hypodopaminergic CNS thus resulting in a tendency to seek external augmentation of dopaminergic stimulation through substances or activities. Repeated exposure to addictive agents including substances and belief systems provides the opportunity for the commencement of the self-perpetuating addictive process.

Once established, addiction becomes a compulsion, and blends into obsessive–compulsive disorder (OCD). As with OCD, the obsession and compulsion associated with addiction may be ego-alien and the individual may wish to "get over" them, but find it impossible to do so. Environmental cues such as drinking buddies, drug paraphernalia, and religious symbols and rituals are strong memeplexes supporting and maintaining the addiction.

Are all addictions mental illness? Not necessarily. Some hobbies and even work (workaholism) may be addicting but are hardly illnesses. As with other pleasure spectrum conditions, addiction should be memetically considered a problem when it results in a severe conflict between the genetic needs of the organism and the addictive meme.

24.2 Treatment

Detailed descriptions of detoxification and treatment of specific substances including alcohol, narcotics, stimulants, and other substances are available in appropriate

textbooks and are beyond the scope of this book. We will discuss here briefly how distortions of the pursuit of pleasure might be approached.

Memes first arose as they provided a shortcut from trial and error in attaining pleasure first by forming memories of the location of food and the activities that resulted in mating, and then by learning to imitate the behavior and/or appearance of the successful ones. As memes evolved as information, and components of culture, certain memes attached themselves to the pleasure apparatus of the brain *regardless* of the welfare of the organism as a whole. Such memes, in the form of tradition and religion, co-opted the brains to spread and perpetuate themselves often at the expense of individual pursuit of pleasure.

In the meanwhile, for those with genetically influenced hypodopaminergic brain, exogenous substances provided the needed "fix," and drug use also spread as memes.

Mild cases of both instances, such as coffee drinking and "spirituality", are instances of normal pursuit of pleasure.

We discussed that drug use per se is not an illness, but defined to be a problem by society arbitrarily only for certain substances. There are powerful irrational memes that compete with substances for pleasure-giving potential, such as religions and other ideologies and they actively seek to suppress the substances for the sake of their own expansion of power and thus replication. It is such puritanical memes that frown upon and criminalize most pleasure-giving activities including drugs. As with the case of the Prohibition in the United States, crime syndicates prosper and countless violent and nonviolent crimes are committed because drugs are illegal.

Education provides an individual with the ability to analyze and process memes concerned with obtaining pleasure, which includes substances, behaviors, activities, and ideals. An informed populace will choose not to use harmful substances even if they are legal and even marketed. Such a populace will also not become addicted to fanaticisms.

Addictions that are ego-alien and compulsive should properly be considered to be an illness as the individual loses control over the activity even when it is obviously detrimental to his/her immediate health and well-being. The treatment for such illness should be individualized, taking into account the genetic and memetic constitution. It may involve detoxification and rehabilitation, controlled and regulated maintenance of the addiction to avoid withdrawal, or substitutive substances or activity to overcome the hypodopaminergic trait. In all these treatment strategies, broad-spectrum anti-meme therapy and specific meme-oriented therapies may be used to neutralize the strong addictive meme (see Chapters 17 and 18).

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