Is Addiction a Brain Disease?

Physiological and Psychological Aspects of Addiction with a Focus on Substance Abuse

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Is addiction a disease? Yes. Is addiction a "brain disease?" No. It is my contention that addiction is not a brain disease though addiction itself can rightly be referred to as a disease. Upon hearing the word "disease," my thoughts go immediately to images of microscopic bacteria and viruses and some of the visible symptoms from such, but what is a disease? "*an impairment of the normal state of the living animal* or plant body *or one of its parts that interrupts or modifies the performance of the vital functions, is typically manifested by distinguishing signs and symptoms, and is a response to environmental factors* (as malnutrition, industrial hazards, or climate), to specific infective agents (as worms, bacteria, or viruses), *to inherent defects of the organism* (as genetic anomalies), *or to combinations of these factors*" (Webster-1, 2014). Addiction certainly qualifies on these terms, but cannot be narrowly assigned to one of its manifesting agents such as the brain. That would be like saying that "Johnnie's blisters have chickenpox." Although evolutionary and genetic factors can influence a predisposition to addiction, addiction itself is an all-encompassing disease involving a variety of interchangeable causes most of which originate from an individual's environment. The brain is affected by this disease and becomes an important mechanism of the disease.

Because addiction can be observed manifesting biologically in the brain, many assume it must be a disease of the brain. If such a case were true, logic would follow that the subject is a victim of this disease and has no choice but to succumb to its symptoms of craving and substance abuse to the detriment of the victim (Satel, 2014). The onset of the brain dysfunction by no means should be underestimated as a powerful influence in ongoing, active addiction (Satel, 2014) (Dodes, 2009). Once established in the brain as a disorder, addictive symptoms can go a long way towards preventing recovery and can easily do so to the point of insuring an untimely death. Even though these biological changes can be capable of such destruction if left unchecked, focusing exclusively on this can tend to severely exclude other significant factors of

causation and possibly prevent practical solutions for recovery from the addiction process (Satel, 2014).

Behaviors may be based in the biological functionality of certain parts of the brain, but when it comes to the decisions that dictate behavior, the sum is greater than its parts. The term "Property Dualism" seems applicable here because the physiological and psychological, though being inseparable and intertwined, are essentially not the same thing (Satel, 2014). Thought and behavior may be utterly dependent upon the gray matter it originates from, but thoughts, behaviors, and choices cannot be predicted through observation of the gray matter itself (Satel, 2014) (Dodes, 2009). Observing the molecular components from a scrap of air will not enable you to predict which way the wind will blow.

Decisions to use brain altering substances are born out of any number of affecting events from the subject's environment prior to the development of what is more appropriately termed a brain disorder (Satel, 2014) (Enoch, 2011). Genetic predispositions relating directly to brain function can also play a part and have been measureable though have not been cited as a primary cause. (Satel, 2014) (Enoch, 2011).

Negative stressors from the environment can be a precursor to addiction especially when occurring early in life (Enoch, 2011). Childhood neglect and abuse, found to be relatively common in this country, along with catastrophic events like hurricanes, tornados, earthquakes, auto accidents, war, etc. and with other influencing factors such as negative socioeconomic conditions, substance abuse in the family, a dysfunctional family, severe loss such as death of a loved one, or being part of a cultural group with inherent stressors are all things that can predate and set the stage for the onset of addiction (Enoch, 2011). All these things can serve to alter brain pathology to create a susceptibility or predisposition to addiction (Enoch, 2011).

One prevalent subset of influencing, environmental factors are those that can result in a feeling of helplessness based on affecting factors unique to the individual (Dodes, 2009). Prior development peculiar to an individual may cause negative, emotional reactions to specific stressors resulting in feelings such as guilt, shame, anger, or humiliation (Dodes, 2009). Thinking they are powerless to alleviate these feelings, the individual will turn to drugs to regain their control over these emotions (Dodes, 2009).

Furthermore, the fact that countless addicts make a decision to abstain and seek treatment and with many achieving success for the rest of their lives, cognitive decision making is shown to override and go on to change and alleviate the disorder (Satel, 2014). The biological condition of the brain that would be or is that of an addict and has been termed as a "brain disease" has never, at least not to my knowledge, shown a measureable pathology leading to remission. The power to make decisions may be severely inhibited in the throes of active substance abuse, but that power yet remains (Satel, 2014).

Other mitigating influences, on addiction, are all too often cited as motivating factors in the decision to stop and seek help. Social, health, financial, and other circumstantial consequences will be expressed by any given subject as the reason/s they have stopped using and sought help (Satel, 2014) (Perring, 2011). The addict was first drawn in by the temptation of the pleasure provided by the drug or from any number of affecting factors from their environment and made a decision to use it and some control over use is exerted, but with continued use, the addict will place more value in the drug than their family, home, and employment along with other obligations and responsibilities (Satel, 2014).

Through neuroplasticity (Webster-2, 2014) changes to neural pathways will have begun and rewards associated with the aforementioned life components will begin to be associated with the drug (Satel, 2014) (Dodes, 2009) (Niehaus, 2009). Drugs may be

able to affect the brain by causing changes in the cellular structure of neurons in the brain such that the brain becomes essentially "wired" for addiction, but neuroplasticity is evident in much more than this. Neuroplasticity is at work in the human brain across the lifetime of an individual while the way they interact with their environment becomes a determinate in the relatively unique changes with unique combinations in the development of their particular brain structure (Karatoreos, 2013). Certainly this can set up a biological predisposition for addiction where adding the substance means full blown, active and progressive addiction, but that is, by no means, something "carved in stone." Experience, knowledge, and interaction outside that of contributors to addiction can affect this same underlying process and change the neuropathology that was once addiction manifest in the brain (Karatoreos, 2013).

As the addict's using progresses, changes in the brain will definitely begin to play a significant part (Niehaus, 2009) (Satel, 2014) (Dodes, 2009). With the drug, the addict can numb the cognitive and emotional consequences of continued and increasing use while cravings and withdrawal symptoms can develop from within the brain and further influence decisions to continue using the drug (Satel, 2014). Does this condition of the brain effect an irresistible compulsion to use again? As of yet, research has not sufficiently described voluntary verses involuntary action as it could relate to a compulsion to use drugs (Perring, 2011). Where would the former end and the latter begin?

The neurotransmitter dopamine is affected by the drugs. Dopamine is central to the reward pathways of the brain that drive us to repeat life sustaining acts as pleasurable experiences. The drug will take over the dopamine processes and replace learned signals of survival behavior with use of the drug (Niehaus, 2009) (Enoch, 2011). The drugs of abuse enhance and alter synaptic transmission of dopamine and can affect long-term, reward memory thereby contributing to addiction (Niehaus, 2009) (Enoch,

2011). Therefor the addict's brain structure and functionality is changing such that use of the drug is equivalent to food, sex, rewarding relationships, earning money from employment, etc. (Niehaus, 2009) (Satel, 2014).

An extreme desire and perceived need for the drug is experienced by the user. An area of the brain called the ventral tegmentum is implicated in the expression of this influence to many other parts of the brain where reward, motivation, planning, and decision making take place (Satel, 2014). Neuroscientists call this "Salience." Having been affected, the prefrontal cortex, the area involved in decision making and inhibition, will then affect other areas involved with behavior (Satel, 2014).

The consequences of neglecting all the things that were once important in their lives begin to accumulate. The family is angry, the employer is about to terminate their position, friends stay away, the bills are not getting paid, and any number of other detrimental circumstances. The enticement of the drug continues, but now the addict faces a dilemma of drug verses survival. The value once placed in the drug comes into check and decisions can be made to stop using the drug, hence, what might have been a progressing disease of the brain can be thwarted by the addict through decision making and in spite of the strong, biological influences of a dysfunctional brain (Satel, 2014) (Dodes, 2009).

It should be noted that results from many surveys have shown that quitting drugs has been the choice of a majority of the subjects in reasonably representative sample studies involving hundreds and thousands of subjects (Satel, 2014). Within these groups, active addiction has proven relatively short lived with post-active symptoms of their addictions disappearing over time and to the degree that there were no more symptoms (Satel, 2014).

Defining addiction as a brain disease has gone a long way towards drawing attention to the subject and gaining increased support and funding for research and

treatment, but has tended to narrow the focus away from this all-encompassing process and more towards the biological (Satel, 2014) (Dodes, 2009). One aspect of narrowed focus is that many researchers and medical professionals have based their interpretations of addiction on the patients they happen to see most often that are more advanced, hard cases where such cases are assumed to be representative of the entire addict population (Satel, 2014). The result produces a stigma about addicts and can decrease the quality and effectiveness of treatment overall (Satel, 2014).

It has been through my own extensive experience and observation that treatment for addiction today most often promotes ongoing, 12 step recovery through Alcoholics Anonymous and Narcotics Anonymous. As the brain had become dysfunctional through the manifestation of active addiction, so it is healed by way of decision making leading to positive action often resulting in successful, lifelong abstention from the offending drugs of abuse. It is often said that the drug and/or alcohol abuse of the addict is merely a symptom of the real, underlying problems. The substance abuse may change the brain, but cognitive realizations of abstract concepts such as spirituality, powerlessness, humility, acceptance, willingness, honesty, empathy, surrender, and open mindedness enable behavioral changes as they are applied to one's life and put into action. Such realizations have proven to be better "brain changers" than drugs in countless recovering addicts.

If addiction is to be successfully treated, open mindedness is not only required from the addict, but also from the medical community along with the community at large. The brain is like addiction's engine giving it the power to manifest in an individual's life. That engine is fueled by influences in the individual's environment as it moves towards ultimate destruction. The opportunity to change course is always there. Active addiction began with a decision and it can end with one.

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