Increasing Cognitive Function May Improve Addiction Treatment Outcomes

Veena Kumari, Ph.D.
Chief Scientific Officer, Sovereign Health Group

Addiction is associated with significant cognitive deficits, especially in attention, working memory and inhibitory or executive control domains (Gould, 2010). Some of these (e.g. poor inhibitory control) are considered risk factors following the initial exposure to addictive substances and may become worse, along with emerging deficits in other cognitive domains, with the long-term use of addictive substances or in association with withdrawal. Although the exact pattern of primary cognitive and emotional deficits may vary for different drugs, long-term use of most drugs of abuse is generally associated with alterations in attention, the ability to learn and remember new information, decision making, risk taking, mood, motivation and craving (Nyberg, 2012).

At present, there are insufficient data to delineate a clear picture of cognitive deficits in people with comorbid presentation of addiction and different mental disorders. People with mental disorders, such as schizophrenia or major depression, are more likely than the general population to be addicted to nicotine and abuse drugs and alcohol (SAMHSA, 2007). It is also known that most mental disorders are independently linked with reduced function in many cognitive domains (including those linked to addiction), e.g. marked disruption of working memory and associated neural networks even in antipsychotic-free first episode schizophrenia patients (Sharma & Kumari, 2005).

Importantly, there is evidence that cognitive impairment, particularly poor executive function, predicts less favorable outcomes following addiction treatments (Blume & Marlatt, 2009). This is perhaps not surprising, given that executive dysfunction will negatively impact on many activities, including planning, organizing, problem-solving, decision making and self-regulation, all of which are needed to monitor and modify drug seeking/taking behaviors. Poor executive function also predicts a less favorable clinical outcome following cognitive behavioral therapy (CBT) for depression, generalized anxiety disorder and psychosis (Kumari et al., 2009). Taken together, these findings suggest that variability in addiction treatment outcomes, even with comparable treatments, is likely to be at least partially explained by pretreatment cognitive profiles of individual patients, and that one potential benefit of treatments that target cognitive dysfunction may be to increase the capacity of patients to benefit from other treatments such as CBT.

A clear understanding of specific cognitive functions as reliable predictors of good/poor outcome would be particularly useful in assisting clinicians in areas such as treatment planning, as they could highlight areas of unmet need that can then be targeted through specific interventions such as cognitive remediation therapy (CRT). For example, if particular cognitive domains (e.g. poor working memory) are found to be reliably related to poor treatment retention or outcome, specific interventions may be deployed to improve these domains. Recent studies have also shown a normalizing influence of CRT on executive function neural networks (Ramsay & MacDonald, 2015) that, if dysfunctional, have been implicated in the initiation and maintenance of addictive behaviors and poor treatment outcomes.

It is thus now imperative that we not only clearly establish the patterns of cognitive deficits associated with different phases in the cycle of addiction subtypes but use this knowledge to employ neurocognitive rehabilitation approaches, adjunct to traditional addiction treatments, to restore cognitive functioning and associated neural networks in order to optimize the chances of sustained recovery, relapse prevention and positive long-term outcomes, including employment prospects (Chan et al., 2015). It is highly likely that boosting cognitive function would have a feedforward benefit upon treatment outcomes (Eack et al., 2016) and ultimately quality of life of those with addiction.

References


