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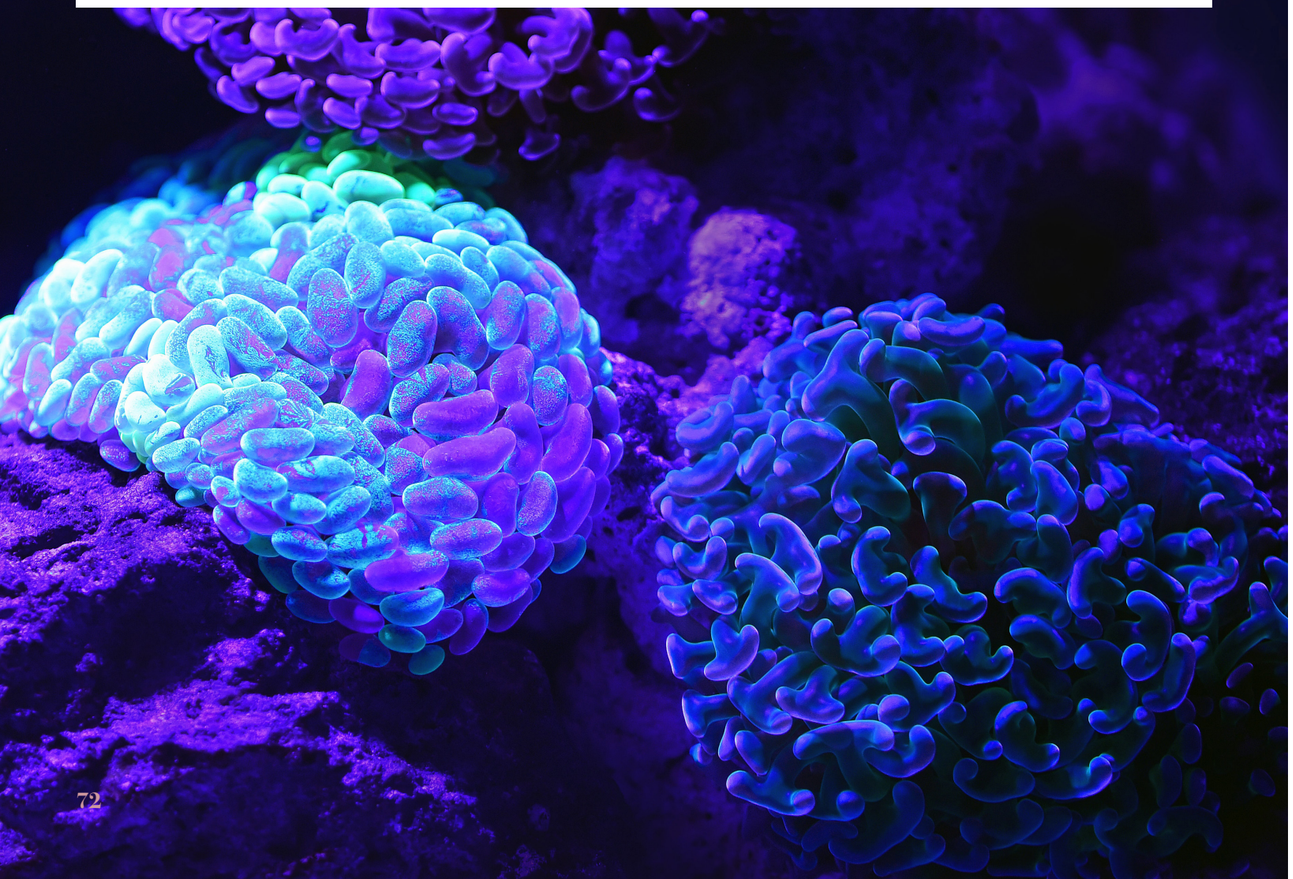
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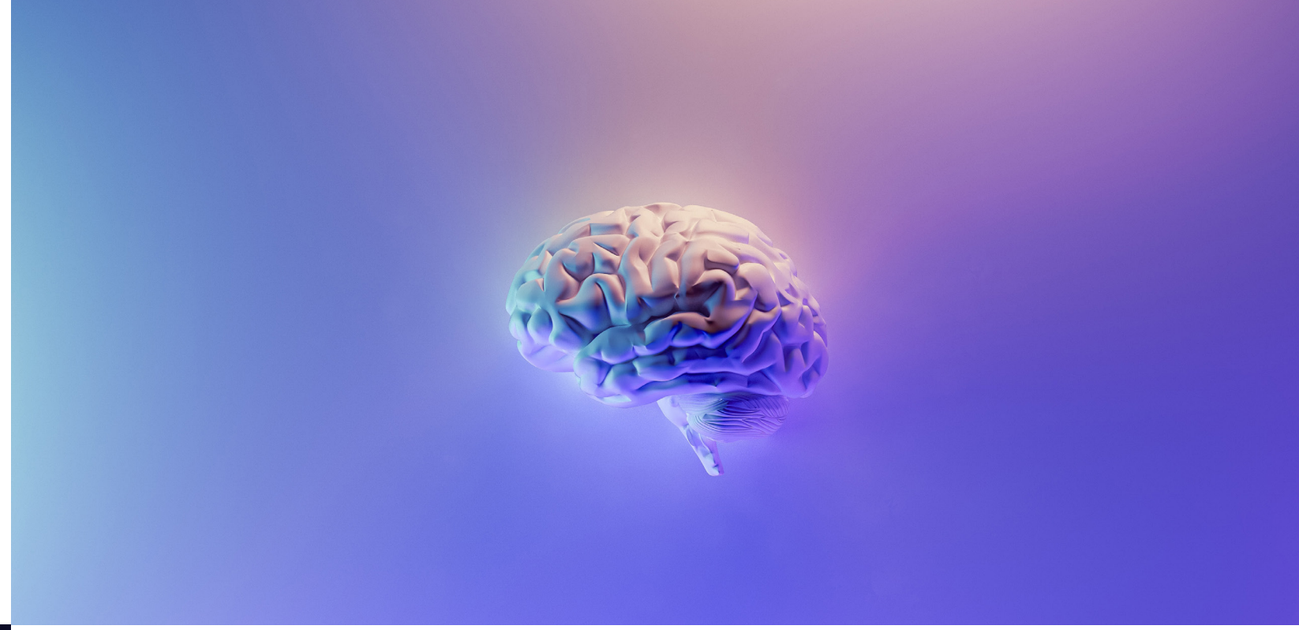
Behavioral Addictions and Psychosis

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Abstract

M.K* is a 27-year-old, single, unemployed male that was driven to the Emergency Department by his foster father, four weeks ago with first episode of psychiatric symptoms of tactile hallucinations, auditory hallucinations of male and female voices making inappropriate sexual comments about him, persecutory delusions and delusions of control for the past five days. M.K is a daily cannabis user of 0.5-1g use for the past 2 years and has 5.5 pack year smoking history. M.K also reports having a pornography and masturbation addiction for 2 years with marked intrusive thoughts of sexual nature the past week. M.K has no medical or psychiatric history. Recent stressor was moving out of foster father's house 8 days ago. The symptoms led to significant impact at work which he has quit since then. On presentation, M. K showed partial insight into his third person running commentary hallucinations but believed adamantly that he was being watched, followed and controlled. He reported hearing his female neighbour stating that he has sexual interest in animals and later heard his manager making pedophilic allegations on him. M.K was so distressed, he quit work and isolated himself in his room. He reported poor concentration and lack of appetite for the past week. M.K describes his baseline mood to have "always been not the greatest" and denied anhedonia, fatigue, or sleep changes. He denied thoughts of self-harm, harm to others or suicidal ideation. Four weeks following inpatient, referral to HBCT and cannabis abstinence has shown improvement in psychiatric symptoms with absence of hallucinations, however, there has been increased symptoms of anxiety with "panic attacks". M.K's biological mother is reported to have history of substance misuse and sister with depressive symptoms. He continues to withdraw from society with increased time spent indoors gaming and shows emotional dependence on foster father.





Discussion

Substance addictions, particularly cannabis, has been shown to be associated with psychosis. When cannabis-induced psychosis is differentiated against schizophrenia, minimal clinical differences are found, in fact, a lower age of admission is noted in cannabis users marking it as a precipitator of psychosis (1). Additionally, eleven percent of substance-induced psychosis cases from a study with 7,606 participants displayed progression to schizophrenia (2). Of these eleven percent, 18% were cannabis users and familial history of psychosis played a major role in disease progression (2). The study however displayed 89% of individuals that did not progress to schizophrenia suggesting that cannabis use is a potent precipitator in vulnerable individuals rather than a disease cause (2). Such discussions are explored in plethora of literature, as well in the DSM-V and ICD11 which explore in depth the psychiatric effect of various substances from intoxication to withdrawal.

However, perhaps due to public health efforts on reducing substances and alcohol dependency, there may be underassessment of other forms of addictions that can be equally distressing on patient life (3). Due to potent biological along with psychiatric side effects of substance misuse, there is profound research in that field, however behavioral addictions (BA) such as gambling that may have minimal biological implications, still impose significant psychological stress that may result in downstream biological manifestations. As well, literature states that 54.9% of given sample with BA have co-existence with substance abuse (3).

When explored in depth, there appears to be a neuroscientific overlap between substance abuse and behavioral addictions. Neuroscience of addictions regardless of subtype, affects the mesolimbic dopamine pathway which projects to nucleus accumbens, known as the reward center (4). The three-stage model of addictions describes an intoxication phase, withdrawal affect and anticipation (4). The intoxication phase consists of dopamine surge which leads to positive re-enforcement while the withdrawal affect creates a tolerance requiring higher future exposure (4). Anticipation or craving is described as the potential source of chronic relapse (4). According to literature review, there has been "overlap in multiple areas" of substance abuse and behavioral addictions including neurobiology (dopamine), course, comorbidities, and tolerance (4). Clinical literature explores in depth the etiology of dopamine surge in substance induced psychosis, yet there is lack of concrete supportive evidence behind behavioral addictions and their role in psychosis, despite both having a similar etiology. Although therapies and counselling services exist individually for various types of addictions, pornography addiction is yet to be recognised in the DSM-V as a mental health disorder. Although, the DSM-V was updated from *Substance related disorders to Substance-related and Addictive Disorders* (3), manuals such as ICD11 only recognise gambling and online/offline gaming as *Disorders of Addictive Behavior* (5). Whereas BAs ranging from shopping, work, computer, and sex/pornography coexist in substance abusing cohort at higher prevalence than gambling addictions (3). Thus, literature exploring correlation between behavioral addictions and psychosis may perhaps be a future exploration topic given the similar neurobiology with recognised disorders of substance abuse.

On the other hand, ICD11 does explore sexual behaviors such as masturbation and pornography under *Impulse control disorders*

specifically *Compulsive sexual behavior disorder* and outlines a thorough diagnostic criteria for difficulty controlling sexual impulses with unsuccessful efforts to reduce activity despite little satisfaction (5). It also specifies exclusion criteria where in the presence of substance use, this disorder cannot be diagnosed (5). This is where M.K does not fit into this diagnosis due to coexistence of substance misuse with behavioral addictions of gaming, music, pornography and masturbation. If his case is viewed from a black and white lens of substance induced psychosis, his symptoms of persecutory delusions, third person running commentary, and depersonalisation may be explainable from surplus of literature and ICD11 regarding cannabis induced psychosis (5). However, it is important to note that M. K's main psychological distress is caused by his intrusive sexual thoughts and paranoia of being viewed as a pedophile or having interest in beastiality. He denies sexual arousal by these individuals excluding a paraphilic disorder according to ICD11. Instead, the basis of his thought broadcasting is fear of having his sexual thoughts being exposed. Additionally, his tactile hallucinations of legs vibrating and passivity phenomena of being under "erotic hypnosis" suggest an underlying sexual obsession which may be explained with two years of daily pornography addiction rather than cannabis use alone.

In case of M.K where both daily cannabis and pornography consumption overlap to two-year history suggests a multifactorial presentation of psychoses and this should be reflected in his bio-psycho-social management plan. A management plan of antipsychotics and drug abstinence without adequate support for his behavioral addictions fails to create an individualised care plan catered to psycho-social presentation of this patient. In such a case, symptoms of sexual delusions could perhaps recur given that underlying addiction was not addressed, however such a claim is difficult to make due to limited research in this area. Perhaps future research into behavioral addictions and psychiatric manifestations with adequate screening tools may provide a more comprehensive individualised care plan for such cases.

*M.K is a fictional initial to protect patient confidentiality.

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