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Gambling disorder: A gateway for chemical addiction? A case series from India

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Introduction

Gambling disorder (GD) is now recognized as a behavioural addiction, one that is common, and one that often presents itself with other substance use disorders. Recently, there is an increase in number of cases of GD occurring in conjunction with other addictive behaviours. As per DSM-5 criteria (American Psychiatric Association, 2013), prevalence of GD ranges from 0.1% to 0.2% (Petry, Blanco, Stinchfield, & Volberg, 2013), whereas high rates of comorbidity between GD and alcohol use disorder/drug use disorder (AUD/DUD) operate at approximately 28% and 17%, respectively (Lorains, Cowlishaw, & Thomas, 2011). No systematic research has taken place into gambling addiction in India, in terms of the prevalence, prevention or treatment of GD. However, Indian psychiatrists commonly encounter GD as part of their clinical practice (George, Kallivayalil, & Jaisoorya, 2014; George, Velleman & Nadkarni, 2017). The patients with GD often experience impulse control and mental health issues (Tarter, Vanyukov, Kirisci, Reynolds, & Clark, 2006; Yau & Potenza, 2015). These factors may contribute to multiple addictive behaviours as part of baseline vulnerability. Certain of the subsequent addictions may be severe, and can result in morbidity and dysfunctions. The gateway hypothesis was first provided by Kandel (Kandel & Kandel, 1975) and recently described in detail by Vanyukov et al. 2012 (Jazaeri & Habil, 2012; D. B. Kandel & E. R. Kandel, 2015). In the context of drugs, the gateway hypothesis predicts that the use of less deleterious drugs can lead to a future risk of crime, or the using of more dangerous and hard drugs.

Prior studies in reference to the gateway hypothesis report typically a pattern in adolescents where the licit substance use (alcohol, cigarette tobacco) eventually progresses to the illicit drugs (cocaine, marijuana, methamphetamine, and heroin) into adulthood. Recent studies also explore the progression from cannabis to heroin,

and e-cigarettes to the smoking of tobacco (Fergusson, Boden, & Horwood, 2006; Nkansah-Amankra & Minelli, 2016). However, little or no information is available regarding behavioural addictions leading to chemical addiction. To the best of our knowledge, this paper is the first of its kind in this regard.

Here we describe and provide analyses of three cases of GD. With each case a progression took place from licit substances, such as tobacco, to illicit ones. As we will demonstrate, these addictive disorders were intertwined in initiation and course of progression of drug use disorders.

Case Study 1

A 32-year-old married man belonging to a lower socioeconomic status (cycle rickshaw puller) presented himself with the complications of substance use and financial losses, both incurred because of gambling problems. Prior to starting gambling, he was using 10 to 20 beedis daily in a dependent fashion. He started gambling along with his friends because of curiosity. When he began gambling, he used to play the card games mang patta, gin rummy, and teen patti for about 2 to 4 hours per day and spending about INR 10 to 20. Gradually, the time and amount spent on gambling increased to around 4 to 6 hours per day in 2 to 3 divided time slots spending about INR 1000 per day within the span of 1 year. Slowly, he became preoccupied with gambling-related wins, anticipating and planning the next gambling venture, and thinking about the ways to obtain money with which he could gamble. Meanwhile he also started using cannabis (*sulfa*) to cope with his negative mood state following frequent losses in the games. His cannabis consumption progressed to daily use, and the quantity of use increased from 1 to 2 joints of cannabis to 8 to 10 joints within the next 4 years. He would often avoid his family members, and would conceal the extent of involvement from his family, specifically both the time and money he was spending. In the span of 10 years of gambling he lost approximately INR 5 to 10 lakhs money in terms of the gambling specifically, which was far excessive of his total family income of INR 35,000 per year. He consequently acquired huge debts. To recover the money, he started stealing funds from his brother and other relatives. He also started staying away from his home for days without telling his parents, and would descend into physical altercations with family members when he demanded money to gamble. He made repeated and unsuccessful attempts to control or cut back on his gambling activity despite repeated financial losses and the worsening of his family relationships.

At this stage, seven years prior to seeking treatment, the patient was introduced to heroin while chasing route by one of his co-players. He felt euphoria and relief within minutes, a feeling which continued for several hours. Thereafter, he started taking heroin daily to experience its euphoric effects. He became dependent on heroin, and started experiencing severe withdrawal symptoms within six months of first use. Out of desperation, he funded his heroin use daily through his debt—funds given to him

for play only. On a daily basis, he took out of debts of INR 1000, from which he would play INR 500 to 600. The remainder he would use to consume heroin. He paid back that debt with cycle rickshaw pulling. Subsequently, he started injecting heroin because of financial constraints, and, on multiple times, reused needles. His condition further deteriorated with increasing conflicts with family, and his involvement in to an illegal activity (pickpocketing) to sustain his gambling and heroin use. He suffered cumulative losses of around INR 20 lakhs before he started to seek treatment.

The patient was admitted and detoxified in an in-patient setting after failure of OPD-based treatment. He was admitted for further evaluation and management of gambling and drug use problem as per DSM-5. After relevant biochemical investigations, HIV and hepatitis markers were found to be within normal limits and negative, except for lower haemoglobin levels. Buprenorphine maintenance (12 mg per day) was prescribed. Appropriate non-pharmacological management for gambling behaviour was also implemented. Such management included imparting active coping skills through the cognitive behaviour therapy model, as well as effective money management, including the opening and proper utilization of a bank account.

Case Study 2

A 24-year-old male, belonging to an urban family, and to a higher socioeconomic nuclear one relative to that of the gambler in Case Study 1, was brought by his father to outpatient department for treatment. Over the course of eight years, the patient had a gambling history, specifically in the form of sports betting. He also enjoyed four years of cannabis use, specifically ganja and charas; three of club drugs; and two of opioids, specifically heroin. He started problem gambling behaviour, in the form of online sports betting, at the age of 14, influenced by his friends, who were also engaged in online gambling. He spent increasing amount of money to attain same desired amount of excitement. That income started at INR 1000, then increased to INR 1 lakh (0.1 million) per bet, in cricket as well as other sport matches. He became preoccupied with thoughts of playing next venture. He also found himself unable to control the urge to play even in classroom, and hence would play on the school premises. He did this while hiding, sometimes in the washroom. Eventually he neglected his studies, and consequently and unnecessarily needed to enrol in courses for students of limited cognitive ability, or courses for students in special education.

He would conceal the extent of involvement in gambling from his family members. He also hid his earnings—which were, on certain days, as high as INR 10 lakhs rupees. However, sometimes, when he did suffer a particular loss, he felt himself compelled to return to return to gambling as a means to chase those losses. To sustain his gambling, he made financial arrangement with bookies, where he would organize the betting for groups, and would receive commissions from both the parties of active and passive players. He tried to quit betting because of the fear of police and potential threat of legal tussles in it, but found it difficult to

control himself because of his powerful urge to play and desire to win substantial monetary gain.

He was introduced to cannabis by his friends in the context of gambling. He consumed cannabis to deal with negative emotional state and to calm his nerves while playing. He initially used ganja but subsequently started using a more potent form of cannabis charas, smoking four to six joints per day. Dissatisfied with the high from cannabis, and also financially supplemented with profits he earned from gambling, he started to try new drugs, and with different groups of friends, while attending at clubs and rave parties. Subsequently he used mephedrone, 3,4-methylenedioxymethamphetamine (MDMA), cocaine, and lysergic acid diethylamide (LSD), at pubs and rave parties for two to four months, during which his friends taught him more about those drugs. All his earnings from gambling were drained within one year. Because of financial constraints, he started using heroin, and started engaging in illegal activities such as theft, burglary, and stealing from road passengers. He soon developed dependence for heroin. Meanwhile, his family members became aware about his drug use and gambling problem, and consequently tried to confine him at home for days, then months, without success. After the patient expressed his desire to quit, his father brought him to our outpatient department for treatment. The patient was evaluated in detail in the inpatient location, where a diagnosis of gambling disorder was determined. Also determined were a severe opioid use disorder and a mild cannabis use disorder. All diagnoses were made through DSM-5. A long-term treatment plan was formulated for antagonist maintenance and tablet naltrexone 50 mg per day was prescribed. His personality issues were explored in detail, and addressed in the treatment. The patient subsequently discontinued the use of illicit drugs, and did not engage in gambling behaviour until three months after discharge.

Case Study 3

A 23-year-old unmarried man, belonging to nuclear family of upper-middle socioeconomic status, presented himself to the outpatient department with complications related to drug injection. He enjoyed a history of dependent tobacco use, specifically gutka, for eight years, as well as cricket gambling for four years, ganja for three, and opioids, specifically heroin and buprenorphine, for two. Prior to gambling, he was using four to five pouches of gutka daily. After his schooling, he started an employment position in a call centre where, along with personal friends, he started betting online in Indian Premier League (IPL) cricket matches. His first significant gambling success was the earning of INR 50,000 in one day. He acknowledges that the development of his betting habit proved a life-altering change. As part of his gambling, he would also visit sports clubs, where he would bet with the help of bookies. Serially, he earned in one year around INR three to four lakhs, and was even planning, through his consequent earnings to purchase a car. He also started dependent use of cannabis after approximately one year of engagement in gambling behaviour. He would smoke roughly five to six joints per day. Eventually, he started losing his bets. He became distressed and, frustrated, he would increasingly bet to recover his losses. In doing so,

he lost all his earnings. He felt distressed and restless when he tried, because of his lack of money, to cut down the frequency of his playing. He concealed the extent of involvement in betting from his significant family members. He would feel low and depressed after every loss incurred. After knowing about heroin from his co-player, he tried heroin by smoking route, and felt relaxed and relieved of stress related to the losses. Within a month, he started using it daily, and would spend about INR 600 every day purchasing two to three pouches of it. Within three months of heroin use, he developed aspects of dependence, including tolerance and withdrawals, expressed as body aches, restlessness, and watering from eyes, along with intense desire. Eventually, he started injecting heroin and pharmaceutical opioids in the form of buprenorphine intravenously to save on the money on heroin. Gradually, his life hooked itself into a vicious cycle of betting in games, and substance use, in the form of heroin and cannabis. Detailed assessment of psychosocial issues was performed after admission in our centre. His personality assessment revealed narcissistic and depressive personality traits. A diagnosis of severe opioid use disorders, severe cannabis use disorders, severe tobacco use disorder and gambling disorder was made as per DSM-5. Detoxification was executed for heroin, and antagonist maintenance i.e. tablet naltrexone 50 mg/day was considered, along with relapse prevention therapy and cognitive behaviour therapy, both for his gambling disorder.

Discussion

The paper presents three cases of GD, where patients started gambling during adolescence. The first patient was engaged in offline gambling only, second

Table 1
Diagnostic criteria for gambling disorder: DSM 5

Diagnostic criteria	Case 1	Case 2	Case 3
(A) Persistent and recurrent gambling behaviour leading to clinically significant impairment or distress, as indicated by the individual exhibiting four (or more) of the following in a 12-month period			
1. Needs to gamble with increasing amounts of money in order to achieve the desired excitement.	Yes	Yes	
2. Is restless or irritable when attempting to cut down or stop gambling.			Yes
3. Has made repeated unsuccessful efforts to control, cut back, or stop gambling.		Yes	
4. Is often preoccupied with gambling.	Yes	Yes	Yes
5. Often gambles when feeling distressed.			
6. After losing money gambling often return another day to obtain even more.			Yes
7. Lies to conceal the extent of involving with gambling.	Yes	Yes	Yes
8. Has jeopardize or lost a significant relationship, job, or educational or career opportunity because of gambling.	Yes	Yes	
9. Relies on others to provide money to relieve desperate financial situations caused by gambling.	Yes		Yes
(B) The gambling behaviour is not better explained by a manic episode: Applicable to all the three cases			

exclusively in online gambling, and third patient gambled both online and offline. All three patients fulfilled diagnostic criteria for GD, and all progressed to the use of harder or more dangerous illicit substances, e.g. club drugs, as well as heroin, and other injection drugs.

This pattern is similar to the gateway hypothesis concept used to comprehend drug abuse. The hypothesis explains that use of one drug facilitates the use of another drug: early use of gateway drugs, including tobacco and alcohol, predicts use marijuana and other illicit drugs, such as heroin, cocaine and amphetamines. However, early use of marijuana also appears to “open the gate” more readily towards later use of other illicit substances, particularly in the age group of fifteen or older (Nkansah-Amankra & Minelli, 2016). Ever since this hypothesis has been advanced (Kandel, 1975), it has commanded substantial attention as it provides the high practical value in determining a sequential order to drug use initiation. This gateway hypothesis was predated by the similar “stepping-stone” theory that first appeared in the 1930s, and that assumed consumption of a “soft” drug, such as marijuana, inexorably sets an individual on a trajectory to addiction to hard drugs (D. B. Kandel & E. R. Kandel, 2015). In contrast, it is an empirical fact that a substantial proportion of drug users initiates their drug involvement with illicit rather than licit drugs, or even use hard drugs *before* marijuana.

Furthermore, if this analogy is applied to the gambling disorder as a substance-related addictive disorder, in these cases gambling involvement made the patients *familiar* with illicit drugs, such as club drugs and heroin. Patients had permitted their gambling habit to become a breeding point for heroin use, a problem further escalated through gambling-related stress, easy availability of money, negative coping strategies, and the pleasure gambling provided them. All patients suffered financial difficulties, followed by negative emotional states and, eventually, progression to heroin dependence. Several epidemiological studies support a bidirectional relationship in either the development or in maintenance of other addictions. What is more, such addictions can arise as consequences of gambling disorder (Fauth-Bühler, Mann, & Potenza, 2017). Gambling disorder at early age may also raise the risk for another substance or drug addiction especially nicotine and alcohol—particularly alcohol. With alcohol, they met the current disorder criteria over twenty times the standard. (Welte, Barnes, Wiczorek, Tidwell, & Parker, 2001). Whereas, with gambling disorders, as well as opioid and other drug use disorders, a connection may emerge indirectly from the psychopharmacological studies of opioid, dopamine receptors as well as other neurobiological neurotransmitters (Goslar, Leibetseder, Muench, Hofmann, & Laireiter, 2019; Potenza, 2013; Mick et al., 2015).

Moreover, gambling disorder has substantial overlap with “substance-related disorders,” as with commonalities in diagnostic criteria, comorbidities, and neurobiological underpinnings. These underpinnings include brain functioning, and specific forms of cognition, such as impulsivity, compulsivity, reward-punishment processing, and decision making (Boog, Höppener, Goudriaan, M. C. Boog, &

Franken, 2014; Choi et al., 2014; Fauth-Bühler et al., 2017; Hewig et al., 2010; de Ruiter et al., 2009; Miedl, Büchel, & Peters, 2014; Van Holst, Van Holstein, Van Den Brink, Veltman, & Goudriaan, 2012).

Eric Kandel and colleagues provided insights into the nature of memory. In brief, they found that the gene transcription factor cyclic AMP response-element-binding protein (CREB) acts as a switch, converting short-term memory into long-term memory. Kandel et al. also determined, through early human psychology studies, that addiction is a form of learning, one that operates as a priming effect. What is more, that effect enables a permanent connection to the respective intoxications that the experience of specific drugs induce (E. R. Kandel & D. B. Kandel, 2014). Through analysis of historical events, Kandel—after controlling for common adolescent behaviour, as well as mental health and peer affiliations—determined that cannabis use operated as a strong predictor to other drugs. This finding suggests the existence of a requisite gateway to the use of other illicit drugs. This hypothesis enjoys sufficient evidence from studies of both pharmacological mechanistic causation, as well as non-pharmacological causation through social influences; such influences can assume the form of experimentation, removal of fears, and peer normative perceives (Lynskey & Agrawal, 2018). But this gateway hypothesis does not draw any gambling disorder related specific biomechanistic risk connections between both addictions of drug and gambling disorder and also for the stages of use (Fergusson, Boden, & Horwood, 2006; Kandel, Yamaguchi, & Klein, 2006). Additive effects of genes did explain the progression and risk from gambling disorder to drug addictions (Comings et al., 2001). These genetic variants were related to addictions in distinctive group or class manners, such as motivation-reward (Taq 1 DRD2, homozygous 11 genotype of DRD₁ receptor), and affected both regulation (DBH, MAO-A and MAO-B; Ibanez, De Castro, Fernandez-Piqueras, Blanco, & Saiz-Ruiz, 2000) and behavioural inhibitions (Cohen, Young, Baek, Kessler, & Ranganath, 2005). This genetic liability is uniquely causal to one substance use disorder or gambling disorder. Alternatively, it can instead be explained in terms of risk progression from one addiction to another, e.g., gambling disorder to drug use disorder. In this regard, the Common Liability Model (CLM) explains the vulnerability for the range of substance and non-substance addictions. It also reveals stages of severity of illness and, especially, co-occurrence, but nevertheless does not take into account the comprehensive nature of a person's environment of biopsychosocial aspects of substance-related addictive disorders, as well as of their respective progressions (Vanyukov et al., 2012). According Khantzian, self-medication hypothesis-specific effects of each drug class relieve or change a range of difficult affective states, self-esteem, relationships and self-care aspects (Khantzian, 1997; Khantzian, 2017). Gambling disorder in all three cases became alternative to legal substances, such as nicotine and alcohol their pattern of use in adolescents or young adulthood, preceded the progressive use of illicit substances, such as heroin and cocaine. Hence, this alternative to original gateway hypothetical model for GD establishes a theoretical and empirical foundation to perform research into its specific direct causal effect to illegal drugs use, progression, quantification of risk, and other confounding

environmental effects, as well as finding the measures to take targeted specific interventions and prevention (Miller & Hurd, 2017).

According to the gateway hypothesis, young people become involved in drugs in stages and sequences. There is a well-defined developmental sequence of drug use that starts with the use of legal drugs then proceeds to one or more illegal ones. Similarly, both problem gambling and substance use disorders typically begin in adolescence or early adulthood. Each condition is known to wax and wane. Natural recovery seems common to both afflictions (Petry et al., 2014; Vanyukov et al., 2012). Although a gambling disorder can operate as a co-morbid condition, it can, in certain cases, operate as a gateway behaviour. This fact is explained through the self-medication hypothesis, and is illustrated in the present case series. More research is required to understand whether gambling disorders fit the traditional gateway drug model or instead the brain disease model. Gambling disorders, if recognized as a gateway behaviour to more dangerous drugs, can have role in prevention of drug use disorders. Gambling behaviour could be warning sign for subsequent substance use and would open windows for early intervention in such cases.

More importantly, from the perspective of drug policy, gambling is legally allowed in many countries, including the United Kingdom, South Africa, Mexico, and Nigeria. The list is of course much longer. In India, a recent judgement by the Supreme Court decreed that online rummy does not legally qualify as gambling. What is more, a recommendation by the law commission to legalize regulated sports gambling does not seem to recognize gambling disorder. That recommendation has therefore de facto has downplayed the harm of it (Rand & Light, 2005; Srikanth & Mattamana, 2011). At this stage it may not be prudent to legalize gambling considering the harm gambling disorders cause. More clarity and research are needed to test the role of gambling disorders as a gateway to more harmful drugs.

Conclusion

Gambling disorders often manifests themselves with the use of other illicit substances, a fact that is often ignored and underplayed. The presence of gambling disorder can be a significant risk factor for the development of addictions to more harmful drugs. The early identification of gambling problems, coupled with appropriate corresponding interventions, may, in turn, limit progression to other, more dangerous drugs. Any legalization of gambling should be deferred until definitive research evidence for long-term safety of gambling disorder is available. This case series report highlights and provides preliminary evidence for the gambling disorder as a gateway behaviour to illicit drugs.

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