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Clinical letter

Association of temporal lobe epilepsy with gambling disorder in a patient with mild intellectual disability and autism spectrum disorder

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1. Introduction

Gambling disorder (GD) has been reported more commonly in those with Temporal Lobe Epilepsy (TLE). Here we describe a patient where the excitement of engaging in gambling triggers seizures.

2. Case report

A is a 41-year-male with mild Intellectual Disability (ID), left-sided TLE, autism and history of psychosis, first coming to the attention of services at 20 years of age. A was experiencing persecutory delusions, believing his neighbours had inserted a monitoring device in his home and wished to murder him. This led to a psychiatric admission, where he was commenced on antipsychotic medication and discharged. He continues to take antipsychotic medication (Amisulpride), though has remained in remission. A's autism is associated with qualitative impairment in communication, including loud, repetitive speech and invading people's personal space. He also interprets information in a literal manner and demonstrates social naivety. A has never had a relationship and has no close friends, expressing a preference to be alone. He exhibits repetitive stereotyped behaviours, including patting his head and rocking gently when standing. A also demonstrates a strong preference for order, typified by his fastidiously ordered DVD and money collections.

A had an uncomplicated febrile seizure aged 6 months and started having unprovoked seizures aged 1 year. His epilepsy was treatment-resistant in nature, with trials of numerous medications failing to provide significant benefit, including Ethosuximide, Gabapentin, Valproate, Phenytoin and Carbamazepine, as well as combination therapy of Levetiracetam (1500 mg BD) and Topiramate (400 mg BD). After adding Lamotrigine to Levetiracetam and Topiramate, seizure frequency improved from 4 to 7 per month to 2 per month.

A also reports a long-standing history of gambling over 25 years, manifesting as placing bets on horse and greyhound racing. A's gambling urges led to him being banned from local betting agencies, resulting in him travelling further afield to seek alternative outlets. He reports no guilt regarding his gambling, though experiences urges several times per week, manifesting as thinking about images of horses and betting prices. A has insight regarding his gambling behaviours and their consequences, but struggles to resist his urges. After a win he can become generous, treating fellow residents to meals, but following a loss he can be ill-tempered and demand money from others in exchange for services (e.g. shopping). A received intensive specialist community nursing and psychological input targeting his gambling habits, as well as involvement of the local authorities, though such measures proved unsuccessful in preventing further gambling behaviours. A's GD was measured using the Gambling Symptom Assessment Scale (G-SAS) [1], a 12-item self-rated scale for evaluating gambling symptom severity in the week prior to assessment (Table 1).

A's seizure semiology is characterised by an aura of a rising

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Table 1
The G-SAS, with A's scores. The G-SAS is scored out of 48, where 41–48 represents extreme, 31–40 severe, 21–30 moderate and 8–20 mild gambling symptoms. [1].

Item checklist	Severity
1. If you had any unwanted urges to gamble, on average, how strong were your urges?	Extreme (4)
2. How many times did you experience urges to gamble?	2–3 times (2)
3. How many hours were you preoccupied with your urges to gamble?	1–7 h (2)
4. How much were you able to control your urges?	Minimal (3)
5. How often did thoughts about gambling and placing bets come up?	Several to many times (3)
6. Approximately how many hours did you spend thinking about gambling and thinking about placing bets?	1–7 h (2)
7. How much were you able to control your thoughts of gambling?	Minimal (3)
8. Approximately how much total time did you spend gambling or on gambling related activities?	2–7 h (2)
9. On average, how much anticipatory tension and/or excitement did you have shortly before you engaged in gambling?	Extreme (4)
10. On average, how much excitement and pleasure did you feel when you won your bet?	Extreme (4)
11. How much emotional distress has your gambling caused you?	Moderate (2)
12. How much personal trouble has your gambling caused you?	Mild (1)
Overall score	32 (Severe)

Table 2
The Diagnostic and Statistical Manual of Mental Disorders 5th edition (DSM-5) Diagnostic Criteria for Gambling disorder [2].

A/ Persistent and recurrent problematic 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
2	Is restless or irritable when attempting to cut down or stop gambling
3	Has made repeated unsuccessful efforts to control, cut down or stop gambling
4	Is often preoccupied with gambling (e.g. having persistent thoughts of reliving previous gambling experiences, handicapping or planning the next venture, thinking of ways to get money with which to gamble)
5	Often gambles when feeling distressed (e.g. helpless, guilty, anxious, distressed)
6	After losing money gambling, often returns another day to get even ('chasing' one's losses)
7	Lies to conceal the extent of involvement with gambling
8	Has jeopardized or lost a significant relationship, job or educational or career opportunity because of gambling
9	Relies on others to provide money to relieve desperate financial situations caused by gambling
B/ The gambling behaviour is not better explained by a manic episode	

sensation in his abdomen which radiates to the top of his head (sometimes accompanied by a religious ecstatic feeling) and/or vertigo-like symptoms. This is followed by a loss of awareness of his surroundings, oral and manual automatisms and pallor. The episodes are stereotyped, typically 2–3 min in duration, and never persist beyond 5 min. A does not experience generalised seizures. Triggers include excitement surrounding gambling (responsible for approximately 20% of episodes), flashing lights and hot weather. Gambling-related seizures are only associated with the elation of winning; A does not experience seizures when losing. The timing of seizure onset can be immediate, with the rush of excitement on winning, or delayed, upon later recounting his winning bet to others, or when laying his winnings on the floor to count them.

MRI brain revealed left mesial temporal sclerosis, and he was referred to a specialist epilepsy centre for pre-surgical diagnostics, including neuropsychiatric/neuropsychological investigations, video telemetry and further brain MRI. Interictal EEG showed epileptiform activity in the left temporal lobe. Two habitual seizures were recorded, with ictal patterns that were non-localising. He was discussed in a multidisciplinary team meeting and felt to be candidate for a left temporal lobectomy, estimating a 40–50% chance of seizure freedom following surgery. In spite of involving his family/carers in the management plan and providing him with accessible information about a left temporal lobectomy, and the risks of ongoing uncontrolled epilepsy, he declined surgical intervention due to fear of complications.

Although there has been an improvement of seizure duration and frequency to 2 per month with add on Lamotrigine (75 mg BD), A's gambling habits have become more intense and secretive. His latest G-SAS score is 44, indicating extreme severity and required re-referral to clinical psychology for further therapeutic work.

3. Discussion

TLE is characterised by neuronal hyper-excitability often originating from the medial temporal structures (amygdala/hippocampus) or involving them rapidly. Hippocampal sclerosis is a frequent underlying pathology, and potentially amenable to surgical intervention. The diagnostic criteria for GD are outlined in Table 2.

Cavanna et al. [3] investigated the G-SAS and Yale-Brown Obsessive-Compulsive Scale (YBOCS) scores of 88 consecutive adult outpatients with epilepsy across three epilepsy clinics. Patients with TLE had significantly higher mean G-SAS scores relatively to their peers with Frontal Lobe Epilepsy and Idiopathic Generalized Epilepsy. They postulated that this difference could be attributable to alterations in the mesolimbic reward system pathway occurring in TLE. Such a theory is supported by the over-representation of GD in other states associated with dopamine dysregulation, such as patients receiving dopamine agonist treatment for Parkinson's disease. However, with all its complexity, GD is unlikely to be entirely explained by a single neurotransmitter.

A's GD might be explained by poor decision making, as shown by Von Siebenthal et al. [4], who found that individuals who had undergone temporal lobe resection performed significantly worse than insular resection and healthy control groups on tasks involving risky decisions. We were unable to locate any literature publications on the association of successful treatment of TLE and improvement in GD. It is difficult to draw a conclusion whether A's GD might have responded to successful treatment of his epilepsy, due to its treatment-resistant nature and that he has declined neuro-surgical intervention. GD in this case could also be explained by chance occurrence or related to his autistic interests/rituals. Further research is needed to explore these fascinating associations.

Declaration of conflict of interests

The authors have no conflicts of interest to declare.

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