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Case Report

Psychiatry/Mental Health Section

N-Acetylcysteine as an Adjunct to Cognitive Behavioural Therapy (CBT) and Selective Serotonin Reuptake Inhibitor (SSRI) in Gaming Addiction: A Case Report

AKKASH KUMAR RAVICHANDRAN[1], CHAMELEE ANBU[2]

ABSTRACT

Internet Gaming Disorder (IGD) is increasingly recognised as a behavioural addiction in adolescents. It is often linked to academic decline, social withdrawal, irritability, and mood disturbances. Psychotherapy remains the primary treatment approach, but pharmacological options are under exploration. A 16-year-old boy presented with a two-year history of excessive online gaming, progressive academic failure, irritability, disturbed sleep, and low self-esteem. He fulfilled Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5) criteria for IGD and had moderate depressive symptoms (HAM-D score 18). His Internet Gaming Disorder Scale–Short Form (IGDS9-SF) score was 36, above the clinical cut-off. Management involved six sessions of Cognitive Behavioural Therapy (CBT), family psychoeducation, and pharmacological support with N-Acetylcysteine (NAC) 600 mg/day and escitalopram. Over three months, his HAM-D score reduced to 7 and IGDS9-SF to 14, alongside clear improvements in mood, family interaction, and school attendance. The case illustrates the potential role of NAC as an adjunct to psychotherapy and a Selective Serotonin Reuptake Inhibitor (SSRI) in IGD. Through modulation of glutamatergic pathways, NAC may reduce cravings and compulsive behaviours, enhance recovery when combined with psychotherapy and family support.

Keywords: Adolescents, Behavioural addiction, Cognitive behavioural therapy, Glutamate, Internet gaming disorder, Selective serotonin reuptake inhibitor

CASE REPORT

A 16-year-old Tamil-speaking male from an urban, middle socioeconomic background presented with a two-year history of excessive online gaming. Over the past year, his preoccupation intensified, requiring longer durations of play to achieve satisfaction. Attempts to restrict gaming led to irritability and sadness, and he stopped attending school for three months. There was no past or family psychiatric history.

In early childhood, his parents often gave him a mobile phone to keep him occupied. He was temperamentally slow to warm child and maintained a close relationship with his permissive father. Gaming escalated from one hour per day to more than 10 hours daily, particularly on weekends. He became socially withdrawn, confined to his room, and altered his sleep cycle, sleeping only 3-4 hours. He reported low self-esteem, believing he was unattractive compared to peers, and described gaming as providing temporary relief and a sense of achievement.

Physical and routine laboratory evaluations were normal. On mental status examination, he was kempt, avoided eye contact, and expressed feelings of low self-worth. A diagnosis of IGD was made per DSM-5 criteria [1]. On standardised assessment, his Hamilton Depression Rating Scale (HAM-D) score was 18, consistent with moderate depressive symptoms [2]. His IGDS9-SF score was 36, exceeding the clinical cutoff for problematic gaming [3]. As behavioural addictions can coexist with primary psychiatric disorders, structured assessments for mood, anxiety, and Attention-Deficit Hyperactivity Disorder (ADHD) were performed. Depressive features were considered secondary to gaming and low self-esteem rather than a primary depressive disorder; anxiety and ADHD did not meet diagnostic thresholds; substance use was excluded.

Pharmacological management comprised N-acetyl cysteine 600 mg/day (supported by prior IGD case evidence [4] and consistent with broader addiction data [5]) and escitalopram, initiated at 5 mg/day and titrated to 15 mg/day in line with prescribing guidance [6], with clonazepam 0.25 mg/day used briefly for one week to aid sleep and anxiety. He was monitored for adverse effects; none were reported.

Parents received psychoeducation about IGD as a behavioural addiction, its course, and contributors such as low mood, body-image concerns, and permissive parenting. They were advised to set clear limits, reduce screen time, use rewards for healthy behaviours, and support his confidence using calm and non-critical communication.

At baseline, HAM-D was 18 and IGDS9-SF 36. After three months of CBT, family psychoeducation, and pharmacological support, HAM-D reduced to 7 (mild range) and IGDS9-SF to 14. He resumed schooling, improved self-care, and re-engaged with family. Escitalopram (15 mg/day) and NAC (600 mg/day) were continued beyond three months; clonazepam was tapered off within the first week. NAC was continued for eight months and escitalopram for 12 months, with gradual tapering thereafter.

DISCUSSION

This case highlights DSM-5 features of IGD- preoccupation, tolerance, irritability when restricted, repeated unsuccessful attempts to cut down and persistence despite academic decline [1]. Depressive and anxiety symptoms are common in IGD; here, HAM-D confirmed depressive features, but the clinical picture suggested these were secondary to gaming behaviour and low self-esteem rather than a primary mood disorder [2,3].

Single-patient reports illustrate heterogeneity. Sravanthi K et al., described improvement with bupropion plus CBT [7], whereas Gustirani S and Amin MM reported progression to conduct disorder in a younger adolescent despite intervention [8]. In contrast, the present case was driven by body-image concerns and low self-esteem and was managed with CBT, family work, and adjunctive NAC alongside an SSRI.

Observational studies show that IGD can cause persistent psychosocial impairment [9], and many affected adolescents struggle with daily functioning and poor insight into their condition [10]. Low self-esteem and negative self-concept are recurrent vulnerability factors [11], and longitudinal work ties IGD to poorer well-being and mood symptoms [12].

Family environment and sleep patterns play an important role. Evidence shows that family-based therapy can shorten gaming duration and enhance overall adjustment [13], and structured relapse-prevention programms are being tested to sustain progress [14]. Excessive gaming has likewise been associated with disturbed sleep and emotional dysregulation, which were observed in this patient [15].

The distinctive feature here is the adjunctive use of NAC. By restoring glutamate balance within reward circuitry (notably the nucleus accumbens), NAC may reduce craving and compulsive drive [5]. Prior IGD experience with NAC supports feasibility at 600 mg/day [4], and broader reviews confirm this dose is within the effective range [5]. In combination with CBT and an SSRI (dosed per standard guidance [6]), NAC may help address both cognitive-behavioural patterns and underlying neurobiological drivers in adolescent IGD.

CONCLUSION(S)

The IGD is a rising concern among adolescents. While psychotherapy and family interventions remain the cornerstone, this case highlights NAC as a promising adjunct. By targeting glutamatergic dysregulation, NAC may reduce compulsive gaming and enhance recovery when integrated with CBT and family support. Future studies should further evaluate its role and long-term outcomes. Digital literacy, screen-time monitoring, early recognition of gaming-related distress, and inclusion of modules under India's National Digital Health Mission may strengthen preventive strategies.

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PARTICULARS OF CONTRIBUTORS:
1. Senior Resident, Department of Psychiatry, Sri Ramachandra Institute of Higher Education and Research, Chennai, Tamil Nadu, India.
2. Assistant Professor, Department of Psychiatry, Sri Ramachandra Institute of Higher Education and Research, Chennai, Tamil Nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Akkash Kumar Ravichandran,
729 C, North Sixth Street, Thiyagarajanagar, Tirunelveli, Tamil Nadu-627011, India.
E-mail: akakashkumar180@gmail.com

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