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Case Report

Management of internet addiction in an 18-year-old female with endoxifen: a case report

Tanu Singh*

Singh Neuropsychiatry centre, Varanasi, India

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***Correspondence:**
Dr. Tanu Singh,
E-mail: tanus01_med@yahoo.co.in

ABSTRACT

Internet addiction has emerged as one of the rising health concerns in the adolescent age group in recent years, which is traditionally treated with psychotherapy. However, some patients require pharmacotherapy to manage their symptoms. This case report explores the treatment of an 18-year-old female diagnosed with internet addiction. The treatment regimen included endoxifen as adjunctive therapy alongside vilazodone, clonazepam and behavioural therapy. Over one-month period, notable improvements were observed in her symptoms, assessed through clinical global impressions and standardized internet addiction testing. The finding indicates that endoxifen, a direct protein kinase C (PKC) inhibitor, may be an effective treatment for such patients, especially those who do not respond to conventional therapies. This case report emphasizes the future studies focusing on the role of endoxifen in patients with behavioural addiction.

Keywords: Internet addiction, Endoxifen, Vilazodone, Clonazepam, Impulsivity, Treatment outcomes, Adolescent mental health

INTRODUCTION

Internet addiction has emerged as a pressing public health concern in recent years, particularly among adolescents and young adults.[1] Characterized by excessive use of the internet that disrupts daily functioning and leads to psychosocial problems, this condition can manifest through various behaviors such as compulsive gaming, social media engagement, and online shopping.[2] The increasing prevalence of internet addiction necessitates the need for effective treatment strategies that can address both the behavioral and psychological components of the disorder. This case report describes an 18-year-old female who exhibited impulsive internet use accompanied by aggressive behavior when access to the internet was restricted. Her treatment involved a combination of pharmacological interventions and psychotherapy, highlighting the potential efficacy of endoxifen in managing internet addiction, particularly in cases where traditional treatments have proven ineffective.

Endoxifen has gained attention for its potential therapeutic role in managing bipolar disorder (BD) and substance use disorders (SUD). Clinical studies have demonstrated its efficacy as a PKC inhibitor, which is believed to play a significant role in mood regulation.[3] Research indicates that overactivity of PKC signaling is implicated in the pathophysiology of BD.[3] By inhibiting this pathway, endoxifen helps in stabilizing mood and reducing manic episodes. Clinical evidence suggests that endoxifen may act rapidly to alleviate manic symptoms while being well tolerated by patients.[3] Moreover, endoxifen has shown potential benefits for individuals with comorbid conditions such as SUD. In a case report, Tharoor et al highlighted endoxifen's role in reducing alcohol cravings in a patient with both conditions.[4] Dave et al reported successful treatment of two patients with bipolar mania and comorbid substance use disorder using adjunct endoxifen, noting reductions in both manic symptoms and substance use.[5] These findings suggest that endoxifen may offer dual benefits in alleviating symptoms of BD and associated

substance cravings. This dual action makes it a valuable option for patients requiring simultaneous management of mood disorders and substance abuse. Although internet addiction is categorized as a behavioral addiction rather than a form of substance abuse, it exhibits similarities with SUD, including compulsive behavior and considerable disruption to daily functioning.[6] The objective of this case report was to evaluate the efficacy and safety of endoxifen in a patient diagnosed with internet addiction.

CASE REPORT

An 18-year-old female student presented to our clinic with complains of internet addiction since last 5 years. The clinical presentation of the patient revealed significant concerns regarding her internet usage and overall well-being. Over the past two years, the patient had gradually increased her internet use to approximately 10 hours daily. This excessive usage had coincided with a prolonged absence from school, lasting over a year, which contributed to a delayed sleep cycle and substantial weight gain. Behaviorally, she displayed aggressive tendencies towards her parents when access to her phone was restricted. This included threats of suicide and destruction of household items. Her primary activities predominantly involved consuming content on platforms like Instagram and Facebook. Despite these concerning behaviors, there was no prior history of treatment and or any signs of depression or other mental health disorders. A diagnosis of internet addiction was confirmed, prompting the implementation of a structured treatment plan to effectively address the associated challenges. She did not have any physical or psychiatric comorbidities, or any substance use disorder.

Treatment regimen

She was prescribed vilazodone 10 mg twice daily and clonazepam 0.25 mg twice daily for a duration of one month. In the second week of treatment, endoxifen 8 mg was added at bedtime to facilitate recovery, with no additional medications. Also, counselling sessions for motivational enhancement were introduced, which led to a gradual increase in the patient's motivation and a reduction in mobile usage hours. The treatment plan was comprehensive, combining pharmacological interventions with psychotherapy.

Endoxifen was initiated in this patient because of its function as a PKC inhibitor, which has been linked to reductions in impulsivity, an important symptom in this case. The decision to introduce endoxifen followed a sequential approach due to previous treatments being ineffective and concerns regarding tolerability. After initiating endoxifen, clinical response was noted as early as the tenth day of treatment, with a reported decrease in symptoms by approximately 50%. The clinical global impression-severity (CGI-S) Score while initiating endoxifen was 3 (mildly ill) and internet addiction test (IAT) was 70. After one month of therapy with endoxifen, CGI-S score and IAT score reduced to 1 (normal) and 36 respectively (Figure 1). No adverse effects or any menstrual irregularities were recorded during this period noted.

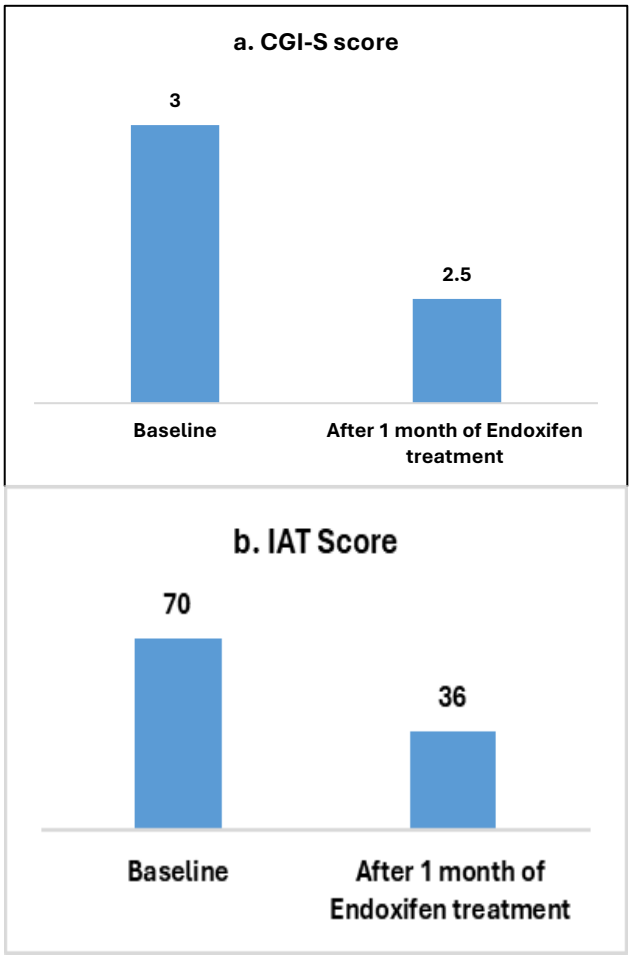

Figure 1 (a and b): Improvement in CGI-S score and IAT score.

The combination of pharmacological treatments and psychotherapy significantly enhanced her recovery. Integrating dialectical behavior therapy (DBT) sessions helped her develop effective coping strategies for emotional dysregulation and impulsivity. As on her last follow up, the patient was on endoxifen 8 mg once daily for 6 weeks.

DISCUSSION

Internet addiction is characterized by compulsive behaviors associated with excessive use of social media platforms like Facebook and Instagram, often manifesting as an obsession with watching reels and engaging with content.[7] This compulsive engagement can disrupt daily functioning, leading to negative consequences such as impaired social relationships, academic decline, and mental health issues similar to those seen in SUD. The diagnostic and statistical manual of mental disorders (DSM-5) does not officially recognize internet addiction

as a distinct disorder; however, it is often conceptualized within the framework of behavioral addictions similar to gambling disorder.[8] Research indicates that individuals with internet addiction may experience symptoms akin to those seen in SUD, such as tolerance, withdrawal symptoms, and continued use despite negative consequences.[4,5] Traditional approaches for treating internet addiction typically include psychotherapy modalities such as CBT and motivational interviewing.[9] While these therapies can be effective in some cases, others may require pharmacological interventions due to co-occurring psychiatric conditions or severe symptomatology. Endoxifen has emerged as a promising adjunctive treatment option due to its unique pharmacological properties and action on multiple neurotransmitter systems implicated in mood regulation and impulsivity control.[3,4]

In this case report, endoxifen demonstrated significant efficacy in reducing impulsivity and aggressive behaviors associated with internet addiction. The marked improvement in CGI-S scores from moderate severity to normal status highlights its potential role in addressing underlying emotional dysregulation. The reduction in IAT scores from 70 to 36 further indicates that endoxifen may effectively mitigate compulsive internet usage patterns while simultaneously addressing co-occurring behavioral symptoms such as irritability and aggression.

Studies have shown that endoxifen can lead to substantial reductions in manic symptoms among individuals diagnosed with bipolar I disorder.[4,5] In clinical trials involving bipolar patients treated with endoxifen at doses ranging from 4 mg/day to 8 mg/day, significant improvements were observed on measures such as the YMRS within just four days. Endoxifen has been reported to provide rapid antimanic effects while being well tolerated compared to traditional mood stabilizers like divalproex.[3,9]

The literature supports the efficacy of endoxifen not only in managing BD but also in treating patients with co-occurring SUD.[4,5] Additionally, endoxifen has shown promise as an adjunctive treatment for pathological gambling, with case studies revealing significant reductions in gambling urges and behaviors.[11]

Importantly, its dual action extends beyond mood stabilization; evidence suggests that it can also reduce cravings associated with SUD or behavioral addictions associated with impulse control disorders. This characteristic makes it particularly beneficial for patients requiring integrated treatment approaches for both mood dysregulation in these psychiatric conditions.

In addition to its efficacy in alleviating symptoms, this case report highlights that endoxifen has a favorable safety profile during treatment, with no reported metabolic side effects or menstrual irregularities in the patient. This indicates its potential as a viable therapeutic option for managing internet addiction while maintaining hormonal balance.

Implications for future research

This case underscores the need for further research into the application of endoxifen for behavioral addictions beyond its established use in BD and SUD.

CONCLUSION

This case report indicates that Endoxifen, a PKC inhibitor, may be an effective treatment for internet addiction, especially in patients who do not respond to conventional therapies. The observed significant improvements in both CGI-S and IAT scores emphasize its potential to reduce impulsivity and enhance treatment outcomes.

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