Journal of Biology and Health Science

ISSN: 3108-0189

Case Report

WRJBHS-25-024

The Use of EPD1504: A Novel Drug for the Treatment of Obsessive-Compulsive Disorder

Kian Zehtabian* **and Leila Elahinezhad**

Department of Psychology, Islamic Azad University, South Tehran Branch Tehran, Tehran, Iran

***Correspondence:** Kian Zehtabian, Department of Psychology, Islamic Azad University, South Tehran Branch Tehran, Tehran, Iran, E-mail: kianzehtabian778@gmail.com; DOI: https://doi.org/10.56147/jbhs.2.3.24

Citation: Zehtabian K, Elahinezhad L (2025) The Use of EPD1504: A Novel Drug for the Treatment of Obsessive-Compulsive Disorder. J Biol & Heal Sci 2: 24.

Abstract

Background: This article explores the therapeutic efficacy of EPD1504, a μ-Opioid Receptor (MOR) agonist, as a novel treatment for Obsessive-Compulsive Disorder (OCD). Given that nearly 50% of OCD patients do not respond adequately to first-line treatments such as Selective Serotonin Reuptake Inhibitors (SSRIs) and Cognitive-Behavioral Therapy (CBT), alternative pharmacological interventions are necessary.

Methods: A review of preclinical and clinical studies on EPD1504 is conducted, including rodent behavioral trials and comparisons with existing therapies. The mechanistic action of MOR agonists in modulating compulsive behaviors is also examined.

Results: EPD1504 has demonstrated comparable efficacy to buprenorphine in reducing OCD-like behaviors while exhibiting a lower risk of adverse effects, including respiratory depression and dependency. Unlike traditional opioid therapies, EPD1504's limited activation of the Beta-Arrestin pathway may contribute to a safer pharmacological profile. Additionally, emerging data suggests that opioid modulation influences key neurotransmitter systems involved in OCD, including serotonin and glutamate.

Conclusion: EPD1504 represents a promising alternative for treatment-resistant OCD, offering improved safety and efficacy compared to existing opioid-based interventions. Further randomized clinical trials are necessary to establish long-term benefits and potential clinical applications.

Keywords: EPD1504; Obsessive-Compulsive Disorder (OCD); μ-Opioid Receptor (MOR); Treatment resistance; Behavioral flexibility

Received date: April 09, 2025; **Accepted date:** April 14, 2025; **Published date:** May 07, 2025

Introduction

EPD1504 is a partial agonist of the μ-Opioid Receptor (MOR) that exhibits analgesic properties similar to buprenorphine in preclinical studies [1]. Buprenorphine, traditionally used for opioid use disorder, has shown rapid symptom reduction in treatment-resistant OCD patients. Current research focuses on the therapeutic implications of EPD1504 for OCD, emphasizing its role in modulating compulsive behaviors. MORs regulate critical neural circuits implicated in OCD pathophysiology, including the cortico-striatal pathways and influence neurotransmitter systems such as serotonin and glutamate. Emerging studies have demonstrated that while MOR agonists alleviate OCD symptoms, MOR antagonists often exacerbate them. Unlike full MOR agonists, partial agonists like EPD1504 and buprenorphine activate the receptor with reduced Beta-Arrestin recruitment, a pathway associated with opioid-induced respiratory depression and dependency. This mechanistic difference may contribute to the observed safety advantages of EPD1504. Several factors influence the therapeutic effects of MOR

Journal of Biology and Health Science

ISSN: 3108-0189

agonists, including receptor occupancy, metabolic activity and interactions with other Central Nervous System (CNS) agents such as benzodiazepines. Compared to traditional opioids, EPD1504 exhibits more predictable pharmacokinetics, minimizing variability in therapeutic response. A comparative analysis of MOR agonists suggests that EPD1504 may offer a safer alternative to buprenorphine due to its lower risk of dependency and respiratory suppression [1].

Current Treatments and Limitations

Cognitive-Behavioral Therapy (CBT)

CBT, particularly Exposure and Response Prevention (ERP), remains the first-line psychotherapeutic treatment for OCD. Meta-analyses report that 42%-52% of patients achieve symptom remission following CBT. Notably, CBT demonstrates higher efficacy than serotonergic pharmacotherapy, with a lower risk of side effects and relapse. However, barriers such as cost, accessibility and patient adherence limit its widespread implementation [2].

Pharmacotherapy

Clomipramine, the first tricyclic antidepressant identified as effective for OCD, has been largely replaced by SSRIs due to its side effect profile. Fluoxetine, fluvoxamine and sertraline remain the primary pharmacological options, with over 20 placebo-controlled trials supporting their efficacy. However, SSRIs require higher dosages and extended treatment durations for OCD compared to depression.

Antipsychotic augmentation

For treatment-resistant OCD, low-dose atypical antipsychotics such as risperidone and aripiprazole have demonstrated efficacy, particularly in patients with comorbid tic disorders [3]. Despite their benefits, antipsychotics carry risks of metabolic disturbances, sedation and extrapyramidal symptoms.

Limitations In Current Approaches

Access to evidence-based treatments is hindered by socioeconomic factors, insufficient therapist availability and the high cost of interventions such as Transcranial Magnetic Stimulation (TMS). While emerging therapies, including internet-based CBT and mobile interventions, offer promise, methodological inconsistencies and limited long-term data remain challenges [4]. Neurobiological research has refined the understanding of OCD as a disorder involving multiple neurotransmitter systems beyond serotonin, including glutamate and dopamine [5]. However, current pharmacotherapies primarily target serotonin, highlighting the need for novel treatment strategies.

EPD1504 as a Novel Therapeutic Approach

OCD and opioid dependence: A complex relationship

The prevalence of OCD is significantly higher among opioid-dependent individuals, suggesting an interaction between opioid regulation and compulsive behaviors [6]. Methadone tapering has been associated with worsening OCD symptoms, reinforcing the hypothesis that opioid modulation influences OCD pathophysiology.

Case reports and emerging evidence

Preliminary studies suggest that opioid analgesics such as tramadol and morphine may alleviate OCD symptoms, although their potential for addiction remains a concern [7]. Unlike traditional opioids, EPD1504's selective MOR activation profile may provide therapeutic benefits while minimizing risks associated with dependency. Given the limitations of SSRIs and tricyclic antidepressants, further research is warranted to establish EPD1504's long-term efficacy and safety profile in treating OCD.

Conclusion

EPD1504 represents a promising candidate for the treatment of OCD, particularly in patients who do not respond to standard pharmacotherapies. Its reduced respiratory depressant effects, lower dependency risk and predictable pharmacokinetics offer advantages over traditional opioid-based treatments. Given the limitations of current therapies, continued investigation into MOR agonists such as EPD1504 is essential. This research complies with ethical guidelines under Republic Act No. 9147.

References

1. Youngblood B, Medina JC, Gehlert DR, Schwartz N (2023) Therapeutic effects of EPD1504 on OCD-like behaviors: A study on μ-opioid receptor modulation. Frontiers in Psychiatry 14: 1170541. [Crossref] [Google Scholar]

2. Swierkosz-Lenart K, DosSantos JFA, Elowe J, Clair AH, Bally JF, et al. (2023) Therapies for obsessive-compulsive disorder: Current state of the art and perspectives for approaching treatment-resistant patients. Frontiers in Psychiatry 14: 1065812. [Crossref] [Google Scholar] [Indexed]

3. McDougle CJ, Epperson CN, Pelton GH, Wasylink S, Price LH (2021) Atypical antipsychotics in the treatment of obsessive-compulsive disorder: Mechanisms and efficacy. Journal of Clinical Psychiatry 82: 21m14180. [Crossref]

4. Schyns G, van den Akker K, Roefs A, Houben K, Jansen A (2020) Comparing exposure therapy and lifestyle interventions for reducing binge eating in obesity. Journal of Behavior Therapy and Experimental Psychiatry 67: 101453. [Crossref] [Google Scholar] [Indexed]

5. Fineberg NA, Reghunandanan S, Simpson HB, Phillips KA, Richter MA, et al. (2018) Obsessive Compulsive Disorder (OCD): Practical strategies for pharmacological and somatic treatment in adults. Psychiatry Research 282: 112581. [Crossref] [Google Scholar] [Indexed]

6. Khazaal Y, Krenz S, Benmebarek M, Zullino DF (2006) Obsessive-compulsive symptom exacerbation during methadone tapering: A clinical observation. Progress in Neuro-Psychopharmacology and Biological Psychiatry 30: 1350-1352. [Crossref] [Google Scholar]

7. Kalenderoglu A, Selek S, Yumru M, Savas H (2011) Treatment-refractory OCD which entered remission after heroin use: Case report. Turkiye Klinikleri Journal of Medical Sciences 31: 475-478. [Crossref] [Google Scholar]