

# Cyclopentolate Use Disorder: A Case Report of Intranasal Misuse

## Siklopentolat Kullanım Bozukluğu: İntranasal Kullanım Yoluyla Bir Olgu Sunumu

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### ABSTRACT

Anti-cholinergic drugs carry dependency risk. Cyclopentolate is a topical anti-cholinergic drug commonly used in ophthalmology clinics which possesses mydriatic and cycloplegic properties. A 28 year old male patient previously diagnosed with bipolar disorder was admitted to the psychiatric clinic with symptoms of depression. We learned that he has been using cyclopentolate containing eye drops intranasally for pleasure for about one year. Hereby, we have reported a cyclopentolate use disorder case with comorbid bipolar disorder, which used cyclopentolate intranasally, different to other cases in the literature.

**Key Words:** Cyclopentolate, use disorder, intranasal, bipolar disorder.

### ÖZET

Antikolinerjik ilaçlar bağımlılık riski taşımaktadırlar. Siklopentolat, oftalmoloji kliniğinde oldukça sık kullanılan topikal miyotik, sikloplejik ve antikolinerjik bir ilaçtır. Psikiyatri polikliniğine, depresif yakınmalarla kontrol amaçlı başvuran 28 yaşında bipolar bozukluk tanısı ile takip edilen erkek hastanın öyküsünden, yaklaşık 1 yıldır siklopentolat içerikli göz damlasını olağan kullanım şekli dışında burun içi yolla keyif almak amacıyla kullandığı öğrenildi. Yazımızda literatürdeki diğer olgulardan farklı olarak siklopentolatı burun içi yolla kullanan ve bipolar bozukluk eş tanısı olan siklopentolat kullanım bozukluğu olan bir olgu rapor edildi.

**Anahtar Kelimeler:** Siklopentolat, kullanım bozukluğu, intranasal, bipolar bozukluk.

### INTRODUCTION

Attention has been drawn to anti-cholinergic agents because apart from their medical use, the euphoric effects caused by this group of drugs increases the potential of addiction (1-3). These euphoric effects can be defined as: elevated mood, increased energy and self-confidence, and a sense of comfort with ones surroundings. Many studies have followed since the first reported case in 1960 (3). The abuse of these drugs is a major health problem (4).

Cyclopentolate is a tertiary amine muscarinic receptor antagonist with my-

driatic and cycloplegic effects commonly used topically in ophthalmology for clinical diagnosis and preoperative evaluation. It exerts an anti-muscarinic effect by creating competitive antagonism against acetylcholine. In our country, it is commercially available in the form of a 1% cyclopentolate hydrochloride solution (5).

### CASE REPORT

A 28-year-old male patient was being periodically followed up for a previous diagnosis of bipolar disorder applied to our clinic. The patient's psychiatric complaints had begun when he was

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twenty years old. The patient had three manic episodes and a depressive episode till today. About a year ago, because of his depressive complaints, he began to take cyclopentolate drops which were suggested by a friend to feel better and less depressed. Contrary to its usual intraocular form of administration, he took the drops intranasally. While he was using half a bottle per day (2,5 ml=1/2 bottle=50 drops) in the beginning, over the following 6 months he began to consume a whole bottle per day (5 ml=1 bottle=100 drops) and to increase the amount of flow, he widened the tip of the dropper. In this way, he daily finished a bottle by applying the drug to both nostrils about 10 times a day. The longest period of time that he did not use the drug was 3 weeks. He stated that his self-confidence improved when he used the drug, his perception of his surroundings changed, he felt himself being “detached” from the environment. He also felt drowsiness, had a dry mouth but generally felt more cheerful. When he was not using cyclopentolate, he stated that he felt distressed, malaise, irritability and socially withdrawn. He expressed that the most important motivation for continuing to use cyclopentolate was the elevation in his mood and the longing for manic episodes. Besides this drug, he also smoked one pack of cigarettes a day and had been using cannabis on and off for about five years. He had no family history of substance use disorder. He did not have a history of any other disease, except for the bipolar disorder. During his psychiatric evaluation he appeared depressed. He indicated that he had recently been having trouble falling asleep, he was feeling worthless and useless, was extremely anxious and felt the need to take cyclopentolate drops again to feel better. His Hamilton Depression Scale score was found to be 17. His biochemical analyses, complete blood count, thyroid function tests and infectious disease screening tests were all found to be within normal ranges. According to the DSM-5, he is diagnosed with “Bipolar Disorder and Other Substance (Cyclopentolate) Use Disorder”.

As the patient was depressive and anxious, bupropion 150 mg/day and diazepam 10 mg/day were added to the treatment. He was given information about the cyclopentolate drops, substance use disorder and bipolar disorder. In follow up examinations,

he stated that his anxiety had decreased therefore the diazepam treatment was stopped gradually. After detoxification and withdrawal treatment, he was taken to the follow visits for psychosocial interviews about drug’s effects and substance use disorder and treatment. His depressive symptoms persisted so the dose of bupropion was increased to 300 mg/day. After three weeks, his Hamilton Depression Scale score was found to be 5. He stated depression was the cause of his drug use, so we treated depression effectively and saw that he quit using cyclopentolate drops. Then, the frequency of his follow up visits were increased. He has stated that he no longer uses cyclopentolate drops for seven months.

## DISCUSSION

The patient has a problematic use of cyclopentolate for about one year, as defined in A criteria of “Other (or Unknown) Substance Use Disorder” of DSM-5. He takes it in larger amounts and over a longer period than was intended. There are unsuccessful efforts to cut down it. He has a strong desire to use cyclopentolate. He has tolerance and withdrawal symptoms. Thus, according to the DSM-5, he has the five criteria from the eleven of “Other (or Unknown) Substance Use Disorder Diagnostic Criteria”, so he is diagnosed with “Other Substance (Cyclopentolate) Use Disorder”. Furthermore, according to the DSM-IV-TR he was diagnosed with “Cyclopentolate Addiction”.

Thus far, five cases regarding cyclopentolate abuse have been reported in literature. In 1975, Ostler described a case using a combination of cyclopentolate and tropicamide (6). In 1992, two more cases were described by Sato (7). In 2008, Akkaya et al. reported cyclopentolate addiction in a patient with Behçet’s disease (8). Recently, Darçın et al. have published a cyclopentolate and tropicamide combination addiction case similar to Ostler’s case (9).

Our case was different from these cases because the drug was not used intraocularly but was used intranasally. Cycloplegic agents can pass into systemic circulation by absorption through the conjunctiva, nasal-lacrimal mucosa and the gastrointestinal system (9). Their effects begin rapidly; however, their duration of effect is short.

A second feature in our case was that this patient had bipolar disorder. Substance abuse is particularly common in patients with bipolar disorder. Rate of substance abuse varies between 30-60% (10,11). However, patients with bipolar disorder generally use alcohol and drugs for self-medication during the depressive phase of their illness. The traditional self-medication hypothesis assumes that specific substances are used to alleviate specific symptoms of the psychosis and to gain relief from negative affect and stress (12). Several studies show that relief of dysphoria was the most frequently endorsed reason as a motivational factor for substance use in severe mental illness (13,14). Over the past decade, the abuse of anticholinergic drugs, especially among psychiatric patients, has received some attention in the clinical setting and medical literature (15). Janowsky and colleagues hypothesised that too much acetylcholine might lead to depression and depression is associated with hyperactivation of the cholinergic system and decreased activity of the noradrenergic system (16). Pettersen et al. found that specific substances were used to cope with specific symptoms or emotional states (17). Anticholinergic abuse potential could be related to their ability to ameliorate negative psychotic symptoms and its inhibiting action on neuroleptic-induced anhedonia (2). There is still not a good biochemical theory that explains anticholinergic dependence. Mesolimbic dopaminergic system formed by the ventral tegmental area, the nucleus accumbens, and the prefrontal cortex is the common final pathway for the reinforcing effect of drug abuse (18). The cholinergic system may play a role in drug addiction. Activation of muscarinic receptors can facilitate dopaminergic transmission and release in the nucleus accumbens. By blocking muscarinic receptors, anticholinergics may inhibit dopamine reuptake and storage. This could explain its euphoric action (19).

In a study conducted to evaluate the self-medication hypothesis, of 494 hospitalized patients with addiction most reported that the use of drugs was for their depressive symptoms and reduction of manic enthusiasm. This situation was more common in male patients in whom depression had been determined (20). Studies have found high rates of alcohol and substance use in bipolar patients and

have also found that the high numbers of addictions cannot be explained by indulging in pleasurable activities during the manic episodes. As a result, the possibility of substance use in bipolar patients being due to multiple reasons seems a more valid view (21). Our patient began to use the cyclopentolate in the depressive periods and to decrease the depressive symptoms. Evaluation of the patient for co-morbid diseases while planning treatment is extremely important for the course of the disease. Administration of anticholinergic medications in patients with mental diseases in order to decrease the extra-pyramidal side effects is a very common practice. For this reason, anticholinergic use disorder of these drugs appears to be another problem in patients with mental disorders. While prescribing drugs with the potential of use disorder, the susceptibility of this population to drug use disorder should be kept in mind. Information should be obtained from patients about their drugs and the way they are used and patients and their relatives should be informed about this issue.

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