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A case of sertraline causing pupil enlargement in a patient

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Abstract

Introduction: Sertraline, an antidepressant belonging to the Selective Serotonin Reuptake Inhibitor (SSRI) class, is widely used to treat various mental health conditions, including depression, anxiety disorders, panic disorder, Obsessive-Compulsive Disorder (OCD), and Post-Traumatic Stress Disorder (PTSD). While it is highly effective, it can also cause certain side effects, one of which is pupil dilation. The connection between sertraline and this side effect is not yet well-established, making this case particularly noteworthy.

Case presentation: A 29-year-old female patient with a history of chronic depression had been intermittently using antidepressants. Over the past six years, her psychiatrist prescribed various medications, including escitalopram oxalate, trazodone hydrochloride, agomelatine, and venlafaxine extended-release capsules. However, due to inconsistent adherence, her symptom control remained suboptimal. Upon hospitalization, given her heightened sensitivity to medications, sertraline was selected for its relative safety profile. Shortly after starting the medication, the patient developed sudden pupil dilation. Sertraline was promptly discontinued, leading to a resolution of the symptom's

Discussion/conclusion: Extensive research has been conducted on the effects of SSRIs, yet pupil dilation is rarely observed in clinical practice. Although some literature suggests a potential link between the two, drug-induced pupil dilation remains one of the rare side effects. In summary, while sertraline is highly effective in treating depression, it may occasionally lead to pupil dilation.

Introduction

Sertraline, a naphthylamine derivative, exerts its primary pharmacological effect by inhibiting the presynaptic reuptake of serotonin (5-HT) in the synaptic cleft. It is widely used to treat various psychiatric disorders, including depression, anxiety disorders, panic disorder, Obsessive-Compulsive Disorder (OCD), and Post-Traumatic Stress Disorder (PTSD) [1]. Studies have shown that SSRIs such as sertraline, paroxetine, fluoxetine, and citalopram can significantly increase pupil diameter [2]. However, pupil dilation associated with the use of these medications typically occurs after prolonged administration, with very few cases reported shortly after starting SSRIs. Sertraline has an elimination half-life of 22-36 hours and is effective with once-daily dosing. In patients receiving the standard antidepressant dosage of 50-150 mg/day, steady-state plasma concentrations vary widely, with differences of up to 15-fold [1]. However, limited data have been published to support a meaningful correlation between sertraline plasma concentration and its therapeutic effects or adverse reactions, which would justify the rationale for therapeutic drug monitoring. The mechanism by which SSRIs induce pupil dilation involves the presynaptic inhibition of serotonin transporters, increasing the availability

of serotonin in the synaptic cleft [3]. Serotonin (5-hydroxytryptamine, 5-HT) is a biogenic amine that exerts diverse effects on both the central and peripheral nervous systems, as well as on smooth muscle fibers, including the dilator and sphincter muscles of the eye [3,4]. In a study, Dr. Gündüz and her team evaluated the effects of SSRIs on anterior segment parameters of the eye and found that these medications may cause changes in pupil diameter. However, pupil dilation is typically observed after long-term use of SSRIs, while its occurrence shortly after initiating treatment remains rare [2].

Case presentation

Patient, female, 29 years old, married, unemployed, consulted on August 23, 2024 for "recurrent unhappiness for 6 years, reoccurring with panic attacks for 1 month". Six years ago, due to work reasons, the patient gradually became unhappy, upset, felt that there was no point in living, had the idea of not wanting to live, and wanted to slit her wrists to commit suicide, and had poor sleep, which manifested itself as difficulty in falling asleep, so she went to the outpatient clinic of Hangzhou Shulan Hospital and was diagnosed with a "depressive state", and was given "escitalopram oxalate 1 tablet QD, trazodone hydrochloride 1 /4 tablet QN". The patient was given "Escitalopram oxalate 1 tablet QD, Trazodone hydrochloride 1 tablet QN". After taking the medicine, the patient felt numbness, and felt emotionally flat, then the patient adjusted the medicine to "Agomelatine 1 tablet QN", the patient felt that his symptoms had improved, and then stopped the medicine on his own.

Mental examination: The patient was alert, oriented, and cooperative during the consultation. Her responses were relevant, with moderate speech rate, volume, and tone. She reported subjective discomfort, including palpitations and chest tightness, but no hallucinations or delusions were elicited. A preliminary assessment of memory, attention, comprehension, and reaction speed showed no significant abnormalities. The patient exhibited a depressed mood, anxiety, and tension, with persistent fear of symptom recurrence. She had a history of negative thoughts, including suicidal ideation and an attempt to slit her wrists, but currently denies any such thoughts or behaviors. There was a noticeable decrease in motivation and interest. Insight was intact.

Physical examination: Cardiopulmonary: No abnormalities detected. Neurological Examination: No significant findings.

In-hospital treatment: Sertraline hydrochloride (50 mg QD). Intravenous diazepam (7.5 mg QD). Hospital Day 2: The patient developed pupil dilation with a diameter of approximately 5 mm, accompanied by blurred vision. She denied symptoms such as chills, fever, dizziness, headache, cough, or sputum production. An ophthalmology consultation suggested refractive error as the cause, with no specific treatment required.

Treatment adjustment: Sertraline hydrochloride (50 mg QD) was discontinued, while intravenous diazepam (7.5 mg QD) was continued. The patient reported improvement in palpitations and chest tightness, with fewer episodes compared to before, though occasional recurrences persisted. On the first day after stopping sertraline, the patient's pupil diameter reduced to 4 mm. By the fifth day, her pupils returned to normal, and the blurred vision resolved.

Physical examination

Cardiopulmonary: No abnormalities detected.

Neurological examination: No significant findings.

Mental examination: The patient was alert, oriented, and cooperative, with relevant answers during the interview. Her speech rate, volume, and tone were moderate. Palpitations and chest tightness showed improvement, and no hallucinations or delusions were elicited. A preliminary assessment of memory, attention, comprehension, and reaction speed revealed no significant abnormalities. The patient's mood and emotional state had improved compared to before. She denied any current negative thoughts or suicidal behavior. Motivation and interest showed improvement, and insight remained intact.

Current status: The patient's condition is stable, and discontinuation of treatment is under consideration for the next phase.

Discussion

Depression is one of the most common mental disorders, affecting nearly 350 million people worldwide. Due to its symptoms, it often results in severe chronic functional impairments [5]. Executive function, memory, attention, processing speed, and psychomotor function are the cognitive domains that are typically significantly affected [6]. The American Psychiatric Association, along with numerous other guidelines, recommends a combination of psychotherapy and pharmacological treatment for managing depression. Selective Serotonin Reuptake Inhibitors (SSRIs) are the preferred first-line option for medication-based treatment [7]. Sertraline, a naphthylamine derivative, exhibits minimal inhibition of major cytochrome P450 enzymes, with only a few clinically significant drug interactions reported. Like other Selective Serotonin Reuptake Inhibitors (SSRIs), it is well-tolerated at therapeutic doses and demonstrates a relatively high safety profile in cases of overdose Acute Angle-Closure Glaucoma (AACG) is the most severe ocular complication associated with SSRIs [8]. Our patient, a 29-year-old female with a history of intermittent antidepressant use, had previously taken SSRI medications without experiencing significant pupil dilation. However, she developed this symptom after taking sertraline, suggesting that sertraline may pose a risk of causing pupil dilation.

Conclusion

This case highlights pupil dilation as an uncommon adverse reaction associated with the use of SSRIs for treating depression. It underscores the need for healthcare providers to exercise increased caution when monitoring patients prescribed SSRIs, with particular attention to pupil changes during sertraline treatment.

Declarations

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Availability of data and material: This article does not fall under the category of data sharing because no data sets were created or examined for this investigation.

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