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CASE REPORT

Serotonin Syndrome in an Adolescent as a Result of Suicide with Fluoxetine

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Abstract

Introduction: The overdose of selective serotonin reuptake inhibitor rarely causes death or serious sequelae. While it may be mildly symptomatic or asymptomatic at doses up to 30 times the daily therapeutic dose, higher doses may cause drowsiness, tremor, gastrointestinal distress, and serotonin syndrome. Serotonin syndrome is a life-threatening condition associated with increased serotonergic activity in the central nervous system. We presented a case who used fluoxetine with the diagnosis of unipolar depression and developed serotonin syndrome as a result of overdose for suicide.
Case Report: A 14-year-old female patient, who was followed up by psychiatry for unipolar depression, ingested 30 tablet fluoxetine for a suicide attempt. Afterwards, serotonin syndrome was observed. As a result of cyproheptadine treatment for signs that developed during the patient's follow-up in the pediatric emergency department, the symptoms started to regress at the 24th hour.
Discussion: In the literature, no similar case study has pointed to a developed serotonin syndrome after suicide with fluoxetine in children. The present study discusses a case in which a side effect resulting in serotonin syndrome occurred after a suicide attempt with fluoxetine.
Conclusion: Although it is stated that fluoxetine overdose is benign, pediatric emergency physicians should be aware that serotonin syndrome may develop in suicidal, high-dose fluoxetine intakes.

Keywords: Fluoxetine, Intoxication, Pediatric emergency, Serotonin syndrome

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INTRODUCTION

Fluoxetine is the first selective serotonin reuptake inhibitor (SSRI), synthesized in 1972 and approved by the United States Food and Drug Administration in 1987 for usage in the treatment of major depression [1]. SSRIs are used in the treatment of depression because they increase serotonergic activity [2]. The relative benign side-effect profile of SSRIs are due to their selectivity [2,3]. Except for the weak antagonistic effect of paroxetine on the cholinergic receptor, none of SSRIs has significant effects on alpha-adrenergic, histaminic, or cholinergic receptors.

SSRI is well absorbed from gastrointestinal tract, reaching peak plasma levels between one and eight hours [2,4]. The half-life of fluoxetine ranges from 1 to 3 days and its metabolite norfluoxetine ranges from 4 to 16 days [4].

An acute SSRI overdose ingestion rarely causes death or serious sequelae [5,6]. An overdoses of up to 30 times the daily dose can typically be mildly symptomatic or asymptomatic, while higher doses can cause drowsiness, tremor and gastrointestinal distress, as well as serotonin syndrome. Overdoses or multiple drug ingestions are responsible for nearly all deaths from SSRI toxicity [7].

Serotonin syndrome is a potentially life-threatening condition associated with increased serotonergic activity in the central nervous system. It can be observed in therapeutic use, drug interactions, and intentional poisonings [8]. Although classically defined as a triad of altered consciousness, autonomic hyperactivity, and neuromuscular abnormality, serotonin syndrome varies clinically from benign to lethal [8-10]. Typically, vital signs include tachycardia and hypertension, but in severe cases, hyperthermia, fluctuations in pulse and blood pressure can be observed. In addition, physical examination findings may include agitation, ocular clonus, pupillary dilatation, tremor, akathisia, increased deep tendon reflexes (common), increased bowel sounds (common), bilateral Babinski sign, dryness of mucous membranes, flushing, and diaphoresis. Neuromuscular findings are typically more prominent in the lower extremities [8].

In this article, a case who used fluoxetine with the diagnosis of unipolar depression and who developed serotonin syndrome as a result of overdose for suicide will be presented.

CASE REPORT

A 14-year-old female patient, who was followed up by psychiatry department due to unipolar depression, was

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brought to our Pediatric Emergency Department via 112 ambulance service because of ingesting 30 fluoxetines one hour before her admission. In the anamnesis, it was realized that she had been using fluoxetine 20 mg/day for 3 months due to unipolar depression, living separately from her family due to her education, and had used her medication irregularly in the last 1 month. It was also identified that she had quarreled with her friends before the suicide attempt, ingested fluoxetine for this reason, then tried to make herself vomit, but was unsuccessful, and told her friends and teachers about the situation.

At the time of admission, her general condition was good, she was conscious, oriented, cooperative, and her Glasgow Coma Scale was 15. Pupils were isochoric and light reflexes were bilateral present. Deep tendon reflexes were normoactive, no pathological reflexes were detected, and muscle strength was 5/5 in all extremities. There were scars on the inner surface of both forearms, the anterior aspect of the left thigh and the anterior aspect of both legs, which healed after from multiple sharp object injuries. Other system examinations were normal. Body temperature was 36.6°C, respiratory rate was 20/min, heart rate was 110/min, and blood pressure was 130/70 mmHg. The patient was followed up with cardiac monitorization, electrocardiography was performed, no pathology was detected. The national poison helpline was called. Gastric lavage and activated charcoal 1 gr/kg/dose were administered. After gastric lavage, the drug pieces were seen in the stomach contents. The patient, whose oral intake was stopped, was started on intravenous fluid therapy and followed up. Frequent vital monitoring and neurological follow-up examination was performed in terms of serotonin syndrome.

In the examination performed at the third hour of the patient's admission, bilateral deep tendon reflexes were found hyperactive in both lower extremities and bilateral mydriasis occured. Moreover agitation, tremor, and intermittent altered consciousness happened. Antihypertensive drug was given to the patient whose blood pressure was found to be hypertensive, which was measured at the 4th hour. In the 6th hour examination, it was found that the patient developed bilateral horizontal ocular clonus. Three doses of cyproheptadine were given due to the thought of serotonin syndrome. The initial dose was 12 mg, followed by 2 mg every 2 hours. During the follow-up of the patient, a gradual regression was observed in her findings within 24 hours.

The patient's follow-up and post-discharge control visits were planned with the disciplines of child psychiatry, forensic medicine, and adolescent health.

DISCUSSION

The patient's symptoms and signs following an overdose of fluoxetine were evaluated as drug intoxication and serotonin syndrome.

Phillips et al. [11] found that although the number of patients was small, patients taking cyclic antidepressants were more likely to have agitation, tachycardia, coma, QRS interval prolongation and required intubation and intensive care unit admission. Among these symptoms, there was none other than tachycardia in our patient. In addition, isolated seizures and cardiac conduction delay have been reported following fluoxetine poisoning [12,13]. No seizure or cardiac conduction delay was observed in our case.

Serotonin syndrome is the most potential serious complication of poisoning with serotonergic antidepressants. Serotonin syndrome can be observed after intoxication with antidepressants or accidental ingestion of more than one serotonergic drug for treatment [14-18]. In our case, serotonin syndrome developed as a result of taking a single drug for suicidal purposes. No life-threatening finding requiring intensive care hospitalization was observed. Symptoms started to regrese after 24 hours.

In the study of Graudins et al. [5], the most common clinical findings were sinus tachycardia, hyperreflexia, inducible clonus, agitation, and tremor. In our case, tachycardia, hyperreflexia, clonus, and tremor were detected together with hypertension, pupillary dilatation, and altered consciousness.

Serotonin syndrome is a clinical diagnosis. Serum serotonin concentrations do not correlate with clinical findings and laboratory tests do not confirm the diagnosis. In severe cases, serious complications such as disseminated intravascular coagulation, rhabdomyolysis, metabolic acidosis, renal failure, myoglobinuria, and acute respiratory distress syndrome may develop [9]. No serious complication developed in our case.

There are five principles in the treatment of serotonin syndrome: discontinuation of all serotonergic agents, supportive treatment for stabilization of vital signs, sedation with benzodiazepines, administration of serotonin antagonists, and consideration of the need to continue the treatment with serotonergic agents after symptoms have resolved [8]. Serotonin syndrome usually resolves within 24 hours after the discontinuation of the serotonergic agent, but symptoms may persist due to its long half-life or active metabolites [8]. Antidote therapy with cyproheptadine is recommended if, despite supportive therapy, improvement of agitation and vital signs fails to occur [14]. In a study, clinical improvement was observed in 71% of the patients after use of cyproheptadine, a first-generation antihistamine with serotonin receptor antagonist properties [5]. Case reports of the use of cyproheptadine to control serotonergic excess have suggested its use in the setting of mild to moderate serotonin syndrome [14,19]. In our case, cyproheptadine was used in this context and symptomatic improvement was observed.

One study showed an increasing trend in calling the national poison helpline for children and adolescents [20]. The increase in poisoning cases has attracted the attention of health authorities [21]. Due to this increase, we think that suicide cases similar to our case may be encountered.

CONCLUSION

We present the clinical course of a patient in whom multiple symptoms such as tachycardia, hypertension, clonus, tremor, hyperreflexia, pupillary dilation, and altered consciousness were observed after acute fluoxetine overdose ingestion. Although it is strongly suggested in the literature that fluoxetine overdose is benign, pediatric emergency physicians should be aware that serotonin syndrome may develop in suicidal, high-dose fluoxetine intakes.

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