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CASE REPORT

A pediatric patient with neuroleptic malignant syndrome

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Abstract

Poisoning by risperidone (an atypical antipsychotic medication) may lead to neuroleptic malignant syndrome and produce extrapyramidal side effects. Diagnostic criteria include recent use of neuroleptics; fever; muscular rigidity; tremors; dysphagia; altered consciousness; tachypnea; tachycardia; leukocytosis; and elevated creatine phosphokinase. Pediatric cases are uncommon but severe, unless they are promptly recognized and treated. This paper reports the case of a child who arrived in an emergency unit presenting extrapyramidal symptoms caused by unintentional risperidone poisoning.

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INTRODUCTION

Risperidone is an atypical antipsychotic medication prescribed in the treatment of a number of conditions, including attention deficit and hyperactivity disorder (ADHD), psychosis, bipolar disease, schizophrenia, autism, and behavioral disorders.[1]

The list of adverse events connected to the use of risperidone includes stroke, orthostatic hypotension, leukopenia, neutropenia, granulocytopenia, venous thromboembolism, extrapyramidal symptoms, neuroleptic malignant syndrome, hyperglycemia, weight gain, risk of developing hyperprolactinemia, metabolic syndrome, priapism, antiemetic effects, and lower seizure threshold.[1,2]

There has been a considerable increase in the number of prescriptions of antipsychotics to pediatric patients, with risperidone topping the list.[3] Increased exposure to the drug combined with poor use of the medication may lead to a growing number of complications. This paper reports the case of a school-aged child presenting extrapyramidal symptoms caused by a risperidone overdose.

CASE REPORT

A 7-year-old male from Macaé, in the State of Rio de Janeiro, arrived at the emergency unit presenting cervical contracture, central cyanosis, dysarthria, history of hyperthermia, and tachycardia. The patient had been on risperidone for the last 72 hours as part of treatment for attention deficit and hyperactivity disorder (ADHD). The prescription read 0.25 ml, but the patient was mistakenly given 2.5ml and developed the symptoms described above.

Upon admission, the patient denied taking additional medication or having other symptoms. Comorbidities and drug allergies were not reported. The child started treatment for ADHD for showing sings of irritability, agitation and aggression, and poor performance at school. He had been performing physical exercises (jiu-jitsu) regularly for two years.

The patient was evaluated by a neurologist, prescribed haloperidol 2 mg, and kept under observation. His symptoms improved partially, but seven hours after admission he had a second episode of muscular rigidity in the neck and trunk. He was given promethazine hydrochloride and a second dose of haloperidol (4 mg). Approximately 20 minutes after medication, he had another episode of muscular hypertonicity. Additional tests and a specialist opinion were ordered.

-Complete blood count: red blood cells: 5.31 million; hemoglobin: 14.5 g/dL; hematocrit: 41.2%; MCV: 77.59 fL; MCH: 27.31 pg; MCHC: 35.19 g/dL; RDW: 13%; WBC: 6750/mm^3 (basophils 0%; eosinophils 9%; myelocytes 0%; metamyelocytes 0%; Auer rods 1%; segmented neutrophils 61%; typical lymphocytes 23%; monocytes 6%); platelets: 250,000/mm^3.

-Biochemical tests: urea: 21 mg/dL; creatinine: 0.5 mg/dL; calcium: 8.9 mg/dL; phosphorus: 4.2 mg/dL; potassium: 4.1 mmol/L; sodium: 135 mEq/L.

The neurologist reassessed the patient and initially suggested he might have dystonia and tardive dyskinesia. Nonetheless, he diagnosed the patient with risperidone poisoning and referred him to a poison center.

Personnel at the poison center recommended the patient should be monitored and kept on intravenous hydration. Additional recommendations included running an ECG, an electrolyte test, prescribing biperiden hydrochloride (0.06mg/kg), and keeping the patient under observation.

The patient had a fourth bout of muscle contractures 24 hours after admission. He was assessed by a child neurologist, who suspended treatment with haloperidol and promethazine hydrochloride, kept the patient on biperiden hydrochloride, and added clonazepam for muscle contractures and muscular rigidity.

-The patient's ECG was normal.

- Complete blood count: red blood cells: 5.49 million; hemoglobin: 14.8 g/dL; hematocrit: 43.5%; MCV: 79.23 fL; MCH: 26.96 pg; MCHC: 34.02 g/dL; RDW: 13.2%; WBC: 5590/mm^3 (basophils 0%; eosinophils 2%; myelocytes 0%; metamyelocytes 0%; Auer rods 0%; segmented neutrophils 73%; typical lymphocytes 18%; monocytes 7%); platelets: 278,000/mm^3

-Biochemical tests: GGT 15 U/L; CRP 6.4 mg/L; CK-MB 35 ng/mL; CPK 144 U/L; urea 18 mg/dL; creatinine 0.66 mg/dL; AST 24 U/L; ALT 30 U/L; alkaline phosphatase 511 U/L;

Myoglobinuria - a factor linked to poorer prognosis - was not measured, since urine samples were not collected. Extrapyramidal symptoms manifested within the first 48 hours of hospitalization. Although the patient was sleepy, his vital signs were stable. He was afebrile and did not report other complaints. The patient was hospitalized until the complete resolution of his symptoms. He was then reassessed by a child neurologist, discharged from the hospital, and referred to the outpatient clinic.

The patient is currently being followed in the pediatric neurology outpatient clinic.

DISCUSSION

Risperidone poisoning may produce a rare secondary effect known as neuroleptic malignant syndrome (NMS), a severe and potentially fatal condition that requires prompt attention and treatment.

The pathophysiology of NMS involves the blockade of dopamine receptors, although it is unclear where or how it works.

The syndrome presents initially with heterogeneous clinical signs. Diagnosis was based on the criteria published by the American Psychiatric Association[4] (DSM V 2013) seen below:

-History of intake of dopamine antagonists 72 hours before the onset of symptoms.

-Fever with oral temperature above 38ºC in two measurements and diaphoresis.

-Severe generalized rigidity unresponsive to antiparkinson medication possibly associated with tremors, sialorrhea, akinesia, dystonia, trismus, myoclonus, dysarthria, dysphagia, and rhabdomyolysis.

-Creatine kinase levels increased to at least four times the upper limit.

-Altered mental status: delirium or altered consciousness.

-Autonomic activation and instability: tachycardia, diaphoresis, blood pressure elevation or fluctuation, urinary incontinence, and pallor.

-Tachypnea and respiratory distress.

The extrapyramidal symptoms manifested by our patient were correlated with the criteria for NMS, in addition to early indicators of disease such as autonomic instability.

Symptoms last for six days on average in children taking atypical antipsychotics. According to the literature, the more common extrapyramidal symptoms are fever and tachycardia.[5] Full recovery takes 30 days in most cases, since the syndrome is a self-limiting condition that ceases once the drug has been discontinued.[4]

The importance of using of criteria lies in expediting diagnosis and treatment, since disease progression leads to seizures, respiratory and renal failure.[6]

Differential diagnosis includes infection, autoimmune disease, epilepsy, and systemic conditions.[4]

NMS therapy includes support measures, discontinuation of medication, and rigorous patient observation. A specific therapy is still being studied, with pediatric populations exhibiting different responses to treatment compared to adults.[7] A small portion of patients may relapse if exposed to antipsychotics after having NMS.[4]

CONCLUSION

Atypical antipsychotic medication poisoning in children is a growing concern, since the number of prescriptions of this drug class has increased substantially in recent years.

This case report aimed to warn readers about the risk of poisoning and reinforce the need to consider neuroleptic malignant syndrome in the roster of diseases listed in differential diagnosis.

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