

## An Interesting Case of Risperidone-Induced Hypothermia Associated with Thrombocytopenia

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### Abstract

According to medical literature, a person who has lost contact with reality is known to be experiencing psychosis. Several psychiatric conditions, such as schizophrenia, bipolar disorder, and depression, are known to be associated with psychosis. It is also seen in people who misuse medications and in those who have underlying illnesses such as hepatic dysfunction, renal failure, etc. Patients suffering from psychosis frequently exhibit hallucinations, delusions, and disordered speech and behaviour. Antipsychotic drugs are typically used to treat patients with psychosis. Antipsychotics come in two varieties: typical antipsychotics and atypical antipsychotics. Typical antipsychotics have a poor safety record and can cause decreased cell counts, increase in body temperature or decrease in body temperature as side effects. Therefore, typical antipsychotics are rarely prescribed for long-term usage by doctors and other medical professionals. In this case study, a 40-year-old patient who was otherwise healthy has presented with thrombocytopenia and hypothermia due to Risperidone[1].

### 1. Introduction:

Acute & chronic psychosis can both be successfully treated with both typical and atypical antipsychotic drugs. When compared to typical antipsychotics, atypical antipsychotics, commonly referred to as 2nd generation drugs, have fewer extrapyramidal side effects. Atypical antipsychotics typically have superior results in the treatment of schizophrenia as they have less extrapyramidal side effects and a safe haematological profile, despite the fact that both 1st and 2nd generation of antipsychotics are equally effective. In comparison to dopamine receptors, D2, 2<sup>nd</sup> generation (atypical) antipsychotics have a tendency to have a higher affinity for the 5-HT<sub>2</sub> receptors. We often see a more affinity toward dopamine receptor D2 in 1<sup>st</sup> generation (typical) antipsychotics. Atypical antipsychotics therefore have fewer extrapyramidal side effects than first-generation antipsychotics because of their affinity

for serotonin receptors. In addition to being used to treat schizophrenia, risperidone is also effective in the treatment of agitation, bipolar disorder, and aggression. This case report will focus on the extremely rare but hazardous adverse effects of risperidone, hypothermia and thrombocytopenia[2].

### 2. Case history:

A 36-year-old male patient, who is a known case of bipolar disorder and schizophrenia, is currently on leveteracitam 500mg, came to emergency department from his home with complaint of disorientation for the past 48 hours. Although the patient is awake & attentive, he is not responding to any oral commands. He was found to have significant thrombocytopenia and 88°F temperature (hypothermia). Table 1 lists the vital signs, whereas Table 2 lists the laboratory results.

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Normal Range	June 24,	june 25, 2022	june 26, 2022	june 27, 2022	june 28, 2022
Temp 97.5 °F - 98.8 °F	87.0 °F	91.0 °F	98.2 °F	98.8 °F	97.9 °F
HR 60-100	53	58	74	79	86
BP Sys: 110-139, Dias 60- 89	92/52	90/65	112/74	124/84	116/74
Oxygen RA	RA	RA	RA	RA	RA

**TABLE 1:** Vital signs of the patient.

Normal	June24, 2022	june 25, 2022	june 26, 2022	june 27, 2022	june 28, 2022
TWBC 4.5-11.0 × 10 <sup>9</sup> /L	6.74	7.36	8.98	7.75	7.12
Hb 13.0-16.5 gm/dL	13.9	12.8	13.4	12.7	12.2
Plt count 1.5L to 4.5L	.41L	.27L	.34L	.90L	1.55L
TSH 0.5 to 5.0 mIU/L	3.6	3.5	3.6		
Cortisol Level	N	N			
Urine R/E	N	N			
Blood C/S	N	N			
CSF analysis	N	N			

**TABLE 2:** Lab test results .

Patient's risperidone medication has started about five weeks ago, as per the available records. Nearly five weeks after beginning risperidone medication, patient started to have symptoms. He developed hypothermia, thrombocytopenia, and mild mental impairment. The patient's urine drug analysis was normal. No acute abnormality was seen on the CT head. He was shifted to intensive care unit for management. The patient was found to have hypotension and was started on inotrope support which was later tapered off once the blood pressure returned to normal. Neurologist was consulted for further evaluation. An MRI was done and showed normal finding. Blood and urine cultures were negative, and x-ray of the chest was normal. Additionally, an echocardiography was done, and it showed normal ejection fraction. CSF analysis was done which was normal. Levetiracetam 500 mg twice daily, risperidone 2mg thrice daily were the patient's home medications. For the patient's schizophrenia, psychiatry was consulted, and they suggested stopping the

risperidone. After stopping risperidone for up to 72 hours, the patient's hypothermia improved. Three days after stopping the risperidone, the patient's platelet count and hypothermia came back to normal. His mental status also improved.

### 3. Discussion

Schizophrenia, bipolar disorder, and other mental illnesses are traditionally treated with atypical antipsychotics like risperidone[2]. Because it has a superior safety profile than other atypical antipsychotics, risperidone is chosen. It has a stronger antagonistic impact on the 5-HT<sub>2</sub> (serotonin) receptor than the D<sub>2</sub> (dopamine), which enables it to have fewer extrapyramidal side effects. Risperidone or any other antipsychotic drug may cause hypothermia, but the precise mechanism is not well understood. Since serotonin is linked to thermoregulation and risperidone has greater affinity for serotonin receptors than dopamine, it is linked to hypothermia. Additionally,

risperidone inhibits the thermoregulatory alpha-2 adrenergic receptor which can cause hypothermia as it blocks the alpha-2 adrenergic receptors, which produce vasoconstriction and shivering in response to cold. An uncommon adverse effect of antipsychotic drug like risperidone is thrombocytopenia, which can have fatal consequences[3]. It affects platelet aggregation, according to studies, but the precise mechanism is yet unknown[4]. Antipsychotic-induced hypothermia was treated with non-invasive external rewarming methods like, use of hot water bottles, blankets, and warm air. The patient's hypothermia completely disappeared after risperidone was stopped, in 48–72 hours. In cases of active bleeding, platelet transfusion might be needed[5].

#### 4. Conclusion

Though rare, the severe side effects of risperidone like thrombocytopenia and hypothermia can have fatal consequences if unrecognised and untreated on time. Worldwide, risperidone is widely used in both inpatient and outpatient settings in the treatment of various psychiatric illnesses. Early diagnosis and identification of these adverse effects will result in quicker patient treatment and recovery and can avoid fatal consequences.

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#### Ethical Consent:

Patient included in the study provided informed consent.

#### Funding:

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#### Conflict of Interest:

The authors declare that there was no conflict of interest.

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