

# Bicytopenia: Adverse effect of risperidone

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**H**ematologic abnormalities, such as leukopenia, agranulocytosis, and thrombocytopenia, can be life-threatening adverse reactions to atypical antipsychotics. Although clozapine has the highest risk of leukopenia and neutropenia, these side effects also have been associated with other atypical antipsychotics, including risperidone, olanzapine, ziprasidone, paliperidone, and quetiapine. Risperidone-induced leukopenia has been reported,<sup>1,2</sup> but risperidone-induced bicytopenia—that is, leukopenia/thrombocytopenia—is rare.

## Case

Mr. A, age 25, is an African American man admitted to an inpatient psychiatric unit for management of acute psychotic symptoms. He has been taking risperidone, 4 mg/d, for the past 6 months, although his adherence to the regimen is questionable. Baseline blood count shows a white blood cell (WBC) count of 4,400/ $\mu\text{L}$  with an absolute neutrophil count (ANC) of 1,900/ $\mu\text{L}$  and a platelet count  $160 \times 10^3/\mu\text{L}$ . A few days after restarting risperidone, repeat blood count shows a drop in the WBC count to 2,900/ $\mu\text{L}$ , with an ANC of 900/ $\mu\text{L}$  and a platelet count of  $130 \times 10^3/\mu\text{L}$ .

Mr. A's physical examination is normal, he does not have any signs or symptoms of infection, and additional lab tests are negative. Risperidone is considered as a possible cause of bicytopenia and is discontinued. Mr. A agrees to start treatment with aripiprazole, 10 mg/d.

In next 10 days, the WBC count increases to 6,000/ $\mu\text{L}$ . The ANC at 3,100/ $\mu\text{L}$  and platelets at  $150 \times 10^3/\mu\text{L}$  remain stable throughout hospitalization. The slowly increasing WBC count after stopping risperidone is highly suggestive that this agent caused Mr. A's bicytopenia.

## Differential diagnosis

Bone-marrow suppression is associated with first- and second-generation antipsychotics. Blood dyscrasia is a concern in clinical psychiatry because hematologic abnormalities can be life-threatening, requiring close monitoring of the blood count for patients taking an antipsychotic. It is important, therefore, to consider medication side effects in the differential diagnosis of  $\geq 1$  hematologic abnormalities in these patients.

Precise pathophysiologic understanding of the hematologic side effects of antipsychotics is lacking, although different mechanisms of action have been proposed.<sup>3</sup> Possible mechanisms when a patient is taking clozapine or olanzapine include:

- direct toxic effect of the drug on bone marrow
- increased peripheral destruction
- oxidative stress induced by unstable metabolites.

There is not enough evidence, however, to identify risperidone's mechanism of action on blood cells.

Aripiprazole might be a useful alternative when another antipsychotic causes leukopenia and neutropenia. In addition to regularly monitoring the blood cell count during antipsychotic treatment, the neutrophil and platelet counts should be monitored.

## References

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## Disclosure

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