[PICTURES IN CLINICAL MEDICINE]

Hypersegmented Neutrophils in Methotrexate Toxicity

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Picture.

An 87-year-old man was referred to the emergency room for a fever and sore throat. He had taken methotrexate (12 mg/week) for 2 years for rheumatoid arthritis and had last taken the drug 2 days before the presentation. A physical examination found multiple oral erosions. Laboratory tests showed a white blood cell (WBC) of 1,800/ μ L (neutrophils 72.8%, lymphocytes 23.9%, monocytes 1.1%, eosinophils 0%); hemoglobin, 11.6 g/dL; platelet count, 10,000/ μ L; mean corpuscular volume (MCV), 89 fL; aspartate aminotransferase, 48 IU/L; alanine aminotransferase, 24 IU/L; and C-reactive protein, 22.1 mg/dL, while a complete blood cell count (CBC) performed 11 days earlier had shown a WBC of 3,500/ μ L; hemoglobin, 13.4 g/dL; and platelet count, 135,000/ μ L. Further work-up did not suggest an infectious cause, with negative results on blood cultures and a rapid influenza diagnostic test. A blood smear examination showed that hypersegmented neutrophils (with ≥ 6 lobes) comprised 35% of the total neutrophil population (Picture). Measurement of the serum level of folic acid and homocysteine was not possible on weekends and non-working days; however, the patient was considered to have methotrexate toxicity, because hypersegmentation of the

neutrophils indicated folate deficiency (1). His symptoms improved within a few days after the initiation of leucovorin treatment, and hypersegmented neutrophils also disappeared 7 days later, when a CBC showed a WBC of 1,700/ μ L; hemoglobin, 8.8 g/dL; and platelet count, 36,000/ μ L. Seventeen days after admission, further improvement was observed: WBC, 8,800/ μ L; hemoglobin, 9.1 g/dL; and platelet count, 240,000/ μ L. Subsequently, his serum vitamin B12 concentration was within the normal range, and the high level of serum ferritin suggested that underlying the chronic inflammation had caused a normal value of MCV, despite the presence of a folate deficiency. Identification of hypersegmented neutrophils may be a simple and useful test for the diagnosis of methotrexate toxicity, even in emergency medicine.

The authors state that they have no Conflict of Interest (COI).

Reference

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