

Vancomycin-Induced Neutropenia

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Epidemiology

Neutropenia is considered a rare side effect of vancomycin therapy. The incidence of vancomycin-induced neutropenia has been estimated to be 2-8% based on retrospective analyses in hospitalized patients (1, 2). The incidence of infections secondary to methicillin-resistant *Staphylococcus aureus* (MRSA) and coagulase-negative staphylococcus has exploded in the last 2 decades, with a corresponding increased use of vancomycin in not only hospitalized patients but also in outpatients. A case-control study found that 12% (14 /114) of all patients treated with vancomycin resulted in neutropenia (3).

Clinical Manifestations

Neutropenia generally occurred after a median of 21 days (range 2-38) of vancomycin therapy (3,4). The median time to development and resolution of vancomycin-induced neutropenia was 24 (range 2-43) and 10 (3-21) days, respectively. Severe neutropenia (absolute neutrophil count <500 cells/mm³) occurred in 3.5% (4/114) of patients (3). Vancomycin-induced neutropenia does not appear to be related to dose, duration of use, serum concentration, or concomitant medications (1, 3, 4).

Pathogenesis

The mechanism of vancomycin-induced neutropenia is an immunological rather than a direct toxic effect of the drug on granulocytes. The likely cause is an antibody-mediated destruction of neutrophils, as observed in patients with the positive test for antineutrophil antibody (1, 5). Bone marrow findings in affected patients showed normal or increased cellularity (6). A hypersensitivity mediated mechanism was thought to be a cause of neutrophil destruction in a neutropenic patient who presented with eosinophilia and rash (7).

Management

Discontinuation of vancomycin is the obvious first step. Treatment with filgrastim (G-CSF) may be effective (4). Rechallenge is usually not recommended; the possibility exists of a more intense neutropenic reaction that occurs earlier than the original episode, presumably because of immune sensitization to the agent (4). Cross-reactivity between other glycopeptides (e.g. teicoplanin) has been reported (2). Monitoring for vancomycin-induced neutropenia is indicated when patients are receiving the drug for more than 2 weeks (4).

References

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