Eosinophilia as a Predictor of Hypersensitivity Reactions in Outpatients Receiving Parenteral Antibiotics


Blumenthal and colleagues retrospectively examined the records of all adults discharged from their institution who were to receive outpatient parenteral antibiotic therapy (OPAT) for at least 2 weeks during the period from 1 September 2012 through 31 December 2013. The antibiotics most frequently administered to the 824 patients who had at least 1 complete blood count during receipt of OPAT were cephalosporins (46%), vancomycin (40%), and penicillins (27%). Eosinophilia (>500 cells/mL) was detected at some point during therapy in 25% of patients, 40% had a median peak value of 726 cells/mL (range, 500–8610 cells/mL), and was first identified after a mean of 15 days of OPAT (interquartile range, 8–22 days). Vancomycin, penicillins, rifampin, and linezolid were each associated with an increased risk of eosinophilia, whereas cephalosporins and fluoroquinolones were not; metronidazole use was associated with a reduced risk.

Of the 210 patients with eosinophilia, 64 (30%) developed a hypersensitivity reaction. These included rash in 30%, renal injury (creatinine level increase of at least 0.5 mg/dL or 50% above baseline) in 15%, and liver injury (new alanine aminotransferase level of >100 U/L) in 6%. Among patients without eosinophilia, these findings occurred in 6%, 10%, and 7%, respectively. After adjustment, patients with eosinophilia had a significantly increased risk of developing rash (hazard ratio [HR], 4.16; 95% confidence interval [CI], 2.54–6.83; P < .0001) and renal injury (HR, 4.16; 95% CI, 2.54–6.83; P < .0001), but not liver injury.

Possible or probable drug reaction with eosinophilia and systemic symptoms (DRESS) was identified in 0.8% of the OPAT population and 3% of those with eosinophilia. All 3 cases of probable DRESS syndrome were attributed to vancomycin; 2 deaths were attributed to DRESS.

The finding that the one-fourth of OPAT recipients who develop eosinophilia have a 4-fold greater risk of rash and a 2-fold greater risk of renal injury than those who do not develop eosinophilia has clinical implications. While the vast majority of patients who develop eosinophilia suffer no significant consequence other than a non-life-threatening skin eruption, a small proportion develop renal injury and some develop DRESS, which is potentially life-threatening. Thus, although the development of eosinophilia does not necessarily indicate a need to discontinue or change antibiotic therapy, it does indicate a need for enhanced monitoring of the patient for worsening of any cutaneous manifestations, the development of systemic symptoms, and renal injury. In this series, DRESS developed in almost 1 in every 100 OPAT recipients, and 29% of those who developed this complication died.

The incidence of eosinophilia in 1 of every 4 OPAT patients and the development of hypersensitivity reactions in some indicates the need for careful oversight and appropriate decision making regarding continuing antibiotic administration. The occurrence of DRESS in almost 1% of OPAT recipients with 2 attributable deaths should be enough to demonstrate the need for dedicated OPAT teams capable of such close monitoring with the rapid identification and response to adverse laboratory and clinical events.

Failure of Ethanol Lock to Prevent Infection of Temporary Hemodialysis Catheters


The incidence of bacteremia related to temporary hemodialysis catheters is reported to range from 3.7 to 9.7 per 1000 catheter-days [1]. The use of antibiotic lock solutions has been demonstrate to reduce the incidence of infection related to long-term hemodialysis catheters, but at the risk of selection of resistant organisms. Ethanol is highly and rapidly microbicidal and does not carry a risk of selection of antibiotic-resistant organisms. Souweine and colleagues evaluated the use of ethanol with a 2-minute dwell time for the prevention of infection related to temporary hemodialysis catheters in a placebo (saline)–controlled double-blind trial in 16 intensive care units at 8 hospitals in France. The short dwell time was chosen based on the rapidity of antimicrobial killing and to prevent damage to the catheters by ethanol. The catheters were nontunneled with double lumens and were not impregnated with antibiotics. The study was powered to...
detect a 66% reduction in the incidence of catheter-related infections.

The intent-to-treat population totaled 1460 patients, 2172 catheters, and 12,944 catheter-days. The catheters were in place for a median of 4 days (interquartile range, 2–8 days) and did not significantly differ between groups. The incidences of major catheter-related infection were 3.83 and 2.64 per 1000 catheter-days in the ethanol and placebo groups, respectively (hazard ratio, 1.55; 95% confidence interval, 0.83–2.87; P = .17). There was also no significant difference in either the incidence of catheter-related bloodstream infection (BSI) or of catheter colonization. Catheter-related clinical sepsis (no BSI, but de
ecessary) or of catheter colonization. Catheter-related clinical sepsis (no BSI, but defined by a specific set of criteria) occurred with incidences of 0.5 and 1.8 events per 1000 catheter-days (P = .03) in the control and ethanol groups, respectively.

Thus, this study provides strong evidence against benefit from the use of short-dwell-time ethanol lock therapy in the prevention of infections related to the use of short-term dialysis catheters.

**Reference**


**Case Vignette: A Lethal Common Cold Viral Infection**


A 19-month-old girl with a history of 3 previous episodes of bronchiolitis was admitted to hospital after 36 hours of respiratory symptoms. On admission, she was unconscious and cyanotic with an oxygen saturation of 48%. Oxygen, methylprednisolone, inhaled adrenaline, and terbutaline were administered without improvement. A chest tube was placed because of pneumothorax and she was mechanically ventilated, but the child died within hours after admission.

Postmortem examination revealed acute diffuse alveolitis and tracheobronchitis. Extensive testing failed to identify any organism other than human rhinovirus C, whose nucleic acid was found in nasopharyngeal aspirates, stool, and cerebrospinal fluid. In addition, infectious virions were isolated from the patient’s serum by inoculation of human airway epithelial cell cultures.

**Case Vignette: Fever in a Visitor From India (With a Side Trip to Massachusetts)**


A 77-year-old resident of India presented to a healthcare facility with a history of 16 days of fever, beginning 2 days before he arrived in Canada. His temperature was 39.2°C, he was anemic, his platelet count was 81,000 cells/μL, and there was mild elevation of serum hepatic transaminases. Ring forms, at a density of 6%, were detected in his erythrocytes, and these were reported by the clinical laboratory as demonstrating the presence of *Plasmodium falciparum*.

A rapid diagnostic test (RDT) for malaria was, however, negative.

Examination of Giemsa-stained blood smears at the Public Health Ontario Laboratories revealed small ring-stage trophozoites and triads resembling Maltese crosses at a density of 6.9%. RDT for malaria was again negative, but a pan-*Plasmodium* polymerase chain reaction (PCR) assay was positive at a cycle threshold of 35, a value consistent with <0.1% parasitemia. Species-specific PCR was negative, but PCR for *Babesia microti* was positive at a cycle threshold of 20. The patient was successfully treated with atovaquone and clindamycin. Because of a positive Lyme serological test, he also received doxycycline for 3 weeks.

Further inquiry found that, prior to arriving in Canada, the patient had spent 6 weeks in a wooded area in Massachusetts near the New Hampshire border and that he had found ticks on himself. Further investigation determined that the pan-*Plasmodium* PCR that gave a false-positive result targeted the parasite’s 18S ribosomal RNA (rRNA) region, which shares a high degree of homology with that of *Babesia*.

The clinical laboratory at Stanford recently introduced PCR testing for malaria that avoided these issues. Their species-specific primers do not target the 18S rRNA region and do not share significant homology with *Babesia*. Furthermore, they sequence the pan-*Plasmodium* amplicon if the species-specific primers do not produce a specific PCR product.

Published by Oxford University Press on behalf of the Infectious Diseases Society of America 2015.
DOI: 10.1093/cid/civ538