Diagnostic Value of Eosinopenia in Non-Typhi Salmonella Enteritis

To the Editor—In their elegant study recently published in *Clinical Infectious Diseases* [1], Waddington and colleagues established a safe human model of *Salmonella* Typhi infection, and identified laboratory findings of typhoid that could be useful early diagnostic clues, among them the well-described (since the 1950s [2]) “aneosinophilia” of enteric fever [1–3]. To our knowledge, the diagnostic utility of eosinophil count in non-Typhi *Salmonella* infections has not been investigated so far.

We retrospectively reviewed medical records and laboratory results of 83 adult patients who presented to the Infectious Diseases Hospital of Thessaloniki during the summer of 2006 (between May and September), with a chief complaint of acute (<7 days) diarrhea, and were admitted to the inpatient medicine

Figure 1. The absolute numbers of eosinophils (A) and their percentage relative to the total white blood cell count (B) were significantly lower in patients with *Salmonella* gastroenteritis, compared with patients admitted to the hospital with acute diarrhea whose stool cultures were negative for bacterial pathogens (P<.001 and P=.001 by Mann–Whitney test). C and D, Relative operating curve analysis of the diagnostic value of a low absolute number of eosinophils (A) or a low eosinophil percentage (B) for the diagnosis of *Salmonella* gastroenteritis. Abbreviations: AUC, area under the curve; CI, confidence interval.
service because of hemodynamic instability and/or electrolyte abnormalities, or because of serious comorbidities. The study was approved by the institutional review board. Forty-seven patients had *Salmonella* gastroenteritis confirmed by stool culture, and 36 inpatients with diarrhea and negative stool cultures served as controls. The 2 groups did not differ significantly in age, sex distribution, and severity of comorbidities.

Both absolute number of eosinophils and their percentage relative to the total white blood cell (WBC) count were significantly lower in patients with *Salmonella* gastroenteritis, compared to controls (*P* < .001 and *P* = .001 by Mann–Whitney test, respectively; Figure 1A and 1B). Relative operating curve analysis also revealed significant diagnostic value of both the absolute number of eosinophils (*P* < .001) and their percentage relative to the total WBC count (*P* < .001) (Figure 1C and 1D). No patient with *Salmonella* gastroenteritis had an eosinophil count >250 cells/µL or >2.5% of total WBCs. *Salmonella* gastroenteritis is characterized by a longer and more severe course, compared with other frequent causes of acute diarrhea, mainly viral infections and food toxins [4]. Therefore, it is an important cause of morbidity and even mortality, especially in elderly and immunocompromised patients, for whom antibiotic treatment is recommended, and hospitalization is often indicated [4, 5].

The number of patients in the present report was small, and our results are likely not reflective of the incidence of *Salmonella* gastroenteritis during different seasons or in other geographic areas. It is also possible that some individuals with negative stool cultures in the control group had received antibiotics by outpatient providers. However, we showed that *Salmonella* infections are almost always associated with significant eosinopenia (Figure 1). Therefore, we believe that an eosinophil count >250 cells/µL or >2.5% at initial presentation can be an early diagnostic clue toward other causes of acute diarrheal illness, before stool culture results become available.

**Note**

*Potential conflicts of interest.* All authors: No potential conflicts of interest.

All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

Dimitrios Farmakiotis,1,2 Christos Ntouloulis,1 Nikolaos Mihailidis,1 Efstratios K. Theofilogiannakos,1 Georgios Makavos,1 Antonios Bakas,1 and Elpiniki Vassiliadou1

1Department of Medicine, Infectious Diseases Hospital of Thessaloniki, Greece; and 2Infectious Disease Section, Baylor College of Medicine, Houston, Texas

**References**


