Deferoxamine Does Not Increase the Risk for Bacteremia in Hemodialysis Patients

Dear Sir,

Deferoxamine (DFO) is commonly used as a chelating agent to treat aluminum [1] or iron [2] overload in patients with end-stage renal disease. Since DFO has been implicated in the pathogenesis of certain opportunistic infections in this setting [3, 4], we studied the incidence of bacteremias associated with DFO therapy in a large group of hemodialysis (HD) patients.

We recorded the bacteremias observed in 3 Belgian in-hospital dialysis centers, between July 1984 and June 1987, in a group of 292 patients, for a total observation period of 7,020 patient months. This study period was subdivided according to whether the patients were treated with DFO or not, and according to the patients’ iron status (serum ferritin levels were measured at least 4 times a year and iron status defined accordingly). Among the 292 patients, 149 were males and 143 females. They had been on hemodialysis for a mean period (±SEM) of 2.7 ± 0.3 years; their mean age was 54.2 years, ranging from 9 to 83. Seventy-five patients had been treated with DFO during the study for a cumulative period of 878 patient months. The indication of DFO therapy had been either aluminium (60 patients) or iron (15 patients) overload, and the weekly dose of DFO (±SEM) averaged 3.0 ± 0.1 g, ranging between 1 and 6 g/week. The diagnosis of bacteremia required at least 1 positive blood culture for gram-negative (G-) and at least 2 positive blood cultures for gram-positive (G + ) bacteremias. The incidence of bacteremias was compared between the subgroups using the \( \chi^2 \) test.

Fifty-five bacteremias (33 G+ and 22 G-) were recorded in 47 patients; 7 occurred during DFO therapy (5 G + , 2 G-), and 48 in the non-DFO period. The G + bacteremias were mainly due to Staphylococcus aureus, while Escherichia coli was the most frequently encountered G- microorganism (table 1). The incidence of bacteremias is given in table 2. During the non-DFO period,

Table 1. Spectrum of bacteremias observed during the study
Table 2. Bacteremias in hemodialysis patients treated with or without DFO

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ferritin levels > 500 ng/ml were associated with a 3.4-fold greater incidence of bacteremias (2.3-fold for G+, p < 0.025, and 6.1-fold for G-, p < 0.005) than ferritin levels ≤500 ng/ml. During DFO therapy, the incidence of bacteremia was not significantly affected by serum ferritin levels. More importantly, the overall incidence of bacteremias was not different during the DFO and the non-DFO periods, whatever the iron status.

It is noteworthy that none of the bacteremias observed in this study was caused by Yersinia enterocolitica. Indeed, DFO has been incriminated in the pathogenesis of generalized yersiniosis in HD patients [3], mainly on the basis of in vitro studies indicating that DFO can be used as an aspecific siderophore by Y. enterocolitica [5]. Moreover, the outcome of experimental yersiniosis is worse in animals treated concomitantly with DFO [6]. However, all the cases of generalized yersiniosis reported in HD patients occurred in association with hemosiderosis, which also is an important risk factor for this opportunistic infection [7]. Thus, the actual role of DFO therapy in the pathogenesis of yersiniosis in HD patients remains largely unknown.

As several recent publications reported fatal mucormycosis in HD patients treated with DFO [4], the present study aimed at investigating whether the risk for bacteremia in HD patients is increased by DFO. Our results clearly indicate, in a large group of HD patients, that this is not the case: DFO therapy does not increase the risk for bacteremia, neither for G+ nor for G− microorganisms, whatever the iron status. Our data are in agreement with those of two other studies on smaller groups of HD patients, also demonstrating that iron overload but not its treatment with DFO increases the risk for bacterial infection [8], and for bacteremia [8, 9]. In one of these studies, DFO therapy even resulted in a significant decrease in the incidence of bacteremias in iron- and aluminum-overloaded HD patients [8].

We conclude that DFO therapy does not increase the incidence of bacteremias in HD patients. The occurrence of mucormycosis in these patients should thus not be viewed as the expression of a more generalized increase in the infection risk due to DFO. The pathogenesis of this fungal infection certainly requires further investigation.

References


