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Why Deferoxamine Therapy Predisposes to Yersinia sepsis

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The letter 'Reappraisal of High-Dose Desferri-oxamine Therapy' by Schiliro and Russo [Acta haemat. 76: 63–64, 1986] is very effective in calling attention to the serious adverse effects of deferoxamine therapy. In relation to the discussion of Yersinia enterocolitica sepsis the authors state: 'It has been postulated that the large amount of iron excreted through the intestine as a consequence of the chelation treatment may represent a growth factor for the bacteria.' This is an inadequate explanation.

Recently, physicians from Toronto, Canada, postulated that deferoxamine administration for iron overload predisposes to Yersinia sepsis by acting as a siderophore and stimulating Yersinia growth [1]. Their postulate is supported by bacteriological studies [2] which have shown that Yersinia pestis, Y. enterocolitica, and Yersinia pseudotuberculosis are unable to produce low molecular weight compounds called siderophores which tightly bind iron and reenter the bacterium through receptor mechanisms. Though unable to produce siderophores to obtain iron, Y. enterocolitica and Y. pseudotuberculosis can utilize exogenous siderophores, including deferoxamine, to maintain growth in iron-limited media. Y. pestis, as well as the other two species of Yersinia, is able to use hemin to obtain iron needed for growth. Deferoxamine, brand name Desferal®, is in fact a hydroxamate siderophore derived from desferrioxamine B produced by Streptomyces pilosus[3].

The Toronto authors recommend that yersiniosis should be considered in iron-overloaded patients presenting with gastrointestinal, pulmonary, or skin problems. They also suggest that while waiting for cultures deferoxamine be withheld and treatment with trimethoprim-sulfamethoxazole be initiated.

Predisposition to Yersinia sepsis is something all health care professionals caring for iron-overloaded patients should know about. Knowing the mechanism of this predisposition is helpful, particularly for those involved in the training of health professions students who, like 4-year-olds, ask why about everything.

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