Iron-Deficiency Anemia: Reexamining the Nature and Magnitude of the Public Health Problem

Introduction

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Anemia remains a major global public health problem for two reasons. It affects about one fourth of the world's population in both industrialized and developing countries, and its health consequences affect all age groups to varying degrees, with pregnant women and young children the most susceptible. Although it is certainly not the only cause, iron deficiency is by far the primary cause of anemia and is the most widespread nutrient deficiency in the world.

The public health importance of anemia has been widely acknowledged. At the 1990 World Summit for Children, the goal to reduce iron-deficiency anemia in women by one third by 2000 was endorsed. The World Health Assembly in 1991 and the International Conference on Nutrition in 1992 reaffirmed this goal.

Measures to control iron-deficiency anemia are implemented in almost all countries. These measures usually focus on pregnant women and infants and consist of distributing oral iron supplements and, to a lesser degree, iron fortification via a suitable food vehicle. However, in spite of the efforts of governments, with support from international and bilateral development agencies and nongovernmental organizations, both anemia and iron deficiency remain endemic in many areas, and their elimination as major public health scourges remains a far-off dream.

Many explanations have been offered as to why this is the case. One explanation relates to the effectiveness of iron supplementation programs, particularly in poorer countries. These programs do not always reach people at the highest risk, health staff are inadequately trained and mobilized to ensure the effective distribution of supplements, and compliance is low due, in particular, to the side effects associated with administered iron preparations.

Perhaps a more fundamental reason why strategies to tackle anemia have difficulty succeeding is because they too often confine themselves solely to the correction of iron deficiency, based on the assumption that iron deficiency is the predominant factor contributing to anemia. Although this might be true in industrialized countries, multiple factors in addition to iron deficiency result in anemia in developing countries. For example, hookworm infection, malaria, chronic infections and other nutrition problems such as folate, vitamin A and vitamin B deficiencies will all play roles. Any successful strategy to combat anemia should therefore address all of these causal factors, even if few data exist on the precise extent to which each contributes.

Iron deficiency and anemia are known to impair psychomotor development, affect physical activity and work capacity, lower resistance to infection, and adversely affect birth outcomes and infant and maternal survival. But how serious are these functional health consequences in terms of public health? In other words, are we able to clearly and accurately ascertain the risks of morbidity and mortality associated with anemia and iron deficiency?

These key issues were precisely the focus of the recent technical consultation jointly sponsored by the World Health Organization and the International Nutritional Anemia Consultative Group, held May 21–24, 2000 at the Belmont Conference Center, Belmont, MD. The objective was to define more clearly the nature of the public health problem and to relate each of the functional consequences, i.e., birth outcome, muscle metabolism, neuronal function and immune function, infectious disease, mortality in young children and pregnant women, cognitive development in children and work capacity, to the severity of iron deficiency, iron-deficiency anemia and all-cause anemia.

The consultation's proceedings, which are included in this Journal of Nutrition supplement, shed new light on our understanding of the public health significance of iron deficiency. It is hoped that this information will stimulate renewed interest in research to develop more effective strategies for combating iron deficiency and anemia.

I would like to thank all consultation participants for their invaluable contributions.

1 Presented at the Belmont Meeting on Iron Deficiency Anemia: Reexamining the Nature and Magnitude of the Public Health Problem, held May 21–24, 2000 in Belmont, MD. The proceedings of this conference are published as a supplement to The Journal of Nutrition. Supplement guest editors were John Beard, The Pennsylvania State University, University Park, PA and Rebecca Stoltzfus, Johns Hopkins School of Public Health, Baltimore, MD.