

Improving iron status in children in poor environments

Rigorous review supports the safety of iron interventions among anaemic children

Papers p 1142

Iron deficiency among children is common, especially in less developed countries, and affects psychomotor development.¹ But the potential risk is that improving iron status may stimulate the development of infection.^{2,3} Although iron supplements improve cognition and growth^{4,5} of deficient children, they can be harmful. Microbial proliferation is influenced by the iron concentration of the culture medium⁶ and iron supplements can produce oxidative stress.⁷ Over the years increased infection rates have been reported after iron intervention.⁸ Bad news always travels faster than good news and clinicians and public health professionals have not given wholehearted support to programmes for prevention of iron deficiency when they are introduced in populations with a high prevalence of infection.

A careful, systematic review in this issue (p 1142) by Gera and Sachdev of a large number of iron intervention trials provides considerable new insights.⁹ Using strict criteria they identified 47 randomised controlled trials and analysed 28–22 published and six unpublished studies. Overall data are from 7892 children who come from a range of environments including Africa,¹⁰ Asia,⁸ the Americas,⁵ Europe,² and Australia and New Zealand.² They found a rate of infection among the iron intervention groups that was no higher than that of the controls. On analysis for individual infections, however, a small but statistically significantly increased risk of diarrhoea was found (11%, $P < 0.04$). In practice this represents only an extra 0.05 diarrhoeal episodes per child per year (95% confidence interval 0.03 to 0.01) and is not striking. Intervention with iron did not have a significant effect on malaria. Is that the end of the story?

Two important infections were not identified during the studies included in this analysis—HIV and hepatitis B. Both are potentially influenced by iron status.^{10–12} However, associations between iron status and infection may be bidirectional—viral infection can alter iron metabolism and iron status may alter severity of disease. No trials have been conducted on the effect of iron interventions on viral replication rates or sever-

ity of disease in HIV or hepatitis C, and so a possible deleterious effect of iron intervention has not been ruled out.

How should these findings affect current public health nutrition policy, especially for children in less developed countries? The rigorous review supports the safety of iron interventions among anaemic children, even if they live in poor environments where infective agents are common. It is not yet clear whether iron interventions make HIV or hepatitis C worse. Randomised clinical trials among iron deficient patients with these infections would clarify the situation.

Andrew Tomkins *professor of international child health*

Centre for International Child Health, Institute of Child Health, London WC1N 1EH (a.tomkins@ich.ucl.ac.uk)

Competing interests: None declared.

- 1 Pollitt E. Iron deficiency and cognitive function. *Annu Rev Nutr* 1993;13:521-37.
- 2 Murray MJ, Murray AB, Murray MB, Murray CJ. The adverse effect of iron repletion on the course of certain infections. *BMJ* 1978;2:1113-5.
- 3 Oppenheimer SJ. Iron and its relation to immunity and infectious disease. *J Nutr* 2001;131:616s-36s.
- 4 Pollitt E, Hathirat P, Kotchabhakdi NJ, Missell L, Valyasevi A. Iron deficiency and educational achievement in Thailand. *Am J Clin Nutr* 1989;50(3 suppl):687-96.
- 5 Beasley NM, Tomkins AM, Hall A, Lorri W, Kihamia CM, Bundy DA. The impact of weekly iron supplementation on the iron status and growth of adolescent girls in Tanzania. *Trop Med Int Health* 2000;5:794-9.
- 6 Kochan I. The role of iron in bacterial infections with special consideration of host-tubercle interaction. *Curr Top in Microbiol Immunol* 1997;60:1-30.
- 7 Kadiiska MB, Burkitt MJ, Xiang QH, Mason RP. Iron supplementation generates hydroxyl radical in vivo. An ESR spin trapping investigation. *J Clin Invest* 1995;96:1653-7.
- 8 Oppenheimer SJ, Macfarlane SB, Moody JB, Harrison C. Total dose iron infusion, malaria and pregnancy in Papua New Guinea. *Trans R Soc Trop Med Hyg* 1986;80:818-22.
- 9 Gera T, Sachdev HPS. Effect of iron supplementation on incidence of infectious illness in children: systematic review. *BMJ* 2002;325:1142-4.
- 10 Weiss G, Umlauf F, Urbanek M, Herold M, Lovevsky M, Offner F, et al. Associations between cellular immune effector function, iron metabolism, and disease activity in patients with chronic hepatitis C virus infection. *J Infect Dis* 1999;180:1452-8.
- 11 Clark TD, Semba RD. Iron supplementation during human immunodeficiency virus infection: a double-edged sword? *Med Hypotheses* 2001;57:476-9.
- 12 Kakizaki S, Takagi H, Horiguchi N, Toyoda M, Takayama H, Nagamine T, et al. Iron enhances hepatitis C virus replication in cultured human hepatocytes. *Liver* 2000;20:125-8.

BMJ 2002;325:1125

Suicide after parasuicide

Evaluate previous parasuicide even if in the remote past

Papers p 1155

Predicting suicide is a delicate matter, certainly difficult even in groups of patients at high risk. A paper in this issue focuses on previous parasuicide as a predictor of suicide (p 1155) and shows that the risk persists without decline for two decades.¹ This observation is relevant for the clinical assessment of risk of suicide and has implications for the treatment of parasuicide as well.

In a large meta-analysis, a history of parasuicide or attempted suicide increased the risk of suicide to 40 times that of the general population.² An attempted suicide that was recognised in health care thus implied a higher risk than having a mental disorder such as major depression, personality disorder, or dependence on alcohol. The risk of suicide is generally most prominent during the first months after psychiatric care.³ The

BMJ 2002;325:1125-6

risk of repetition and consequently of suicide is believed to be highest during the first one or two years after an episode of parasuicide.^{4 5} Follow up studies of hospitalised patients who have attempted suicide show that the initial high risk declines each year.⁶ But recent studies of people who have harmed themselves deliberately and attempted suicide show that the risk persists for a long time.^{5 7} In a retrospective study of suicide we found that the interval between first suicidal behaviour and the suicide was related to the patient's sex and mental disorder. For example, in patients with borderline personality disorder or schizophrenia the suicidal process can take a long time.⁸ Follow up studies of parasuicide would improve if diagnostic subgroups were taken into consideration.

Severity of the attempt indicates higher risk. Extra caution is also warranted in situations with repeated parasuicide, especially when these occur with increasing frequency. More extensive planning of the current parasuicide may indicate a high risk. Mental disorder in general and depressive disorder in particular, if present at the index parasuicide, strengthens the risk for poor outcome. Likewise, the presence of substance abuse at the time of parasuicide increases the danger.⁹ Comorbidity such as substance abuse and another mental disorder is also noteworthy. Concomitant somatic illness should be assessed, especially in elderly people.¹⁰

The view that parasuicide and suicide involve totally different populations has been found to be inaccurate.¹¹ The prevalence of parasuicide is high also in retrospective systematic interview studies of suicide victims. In a study of young adults, previous parasuicide was found in 60% of young men and 80% of young women.⁸ This is a higher rate than among adults in general. Among men of all ages, previous parasuicide was found in about a third and among women of all ages in about two thirds. Irrespective of age, women have higher rates of parasuicide even among those who eventually die by suicide. Expectedly, repeated parasuicide is common in people who commit suicide. Three or more parasuicides occurred in 17% of men and 56% of women.⁸

Can we rely on the answers that patients give when we question them about suicidal ideation in emergencies? Certainly, an empathic interview with the patient

yields an honest answer in most instances. Further, the circumstances of the parasuicide are well worth exploring in the encounter with the patient. To what extent the verbal presentation of suicidal thoughts is valid in assessing the risk of suicide is still doubtful. Most people who commit suicide have communicated such ideation in a more obvious or disguised manner. Fewer than half of them did communicate their intention to family members during their previous suicidal episode.⁸ In a study of suicide in elderly people, the doctors responsible for treating them were less aware of the suicidal thoughts than the family members.¹² In relation to this week's paper there is a good reason to point at previous acts of suicidal behaviour as the most reliable issue to penetrate in the clinical interview.¹ To pay attention to previous parasuicide in the assessment of the patient in the emergency department is crucial, because it may indicate a serious risk even if the act was committed several years ago.

Bo S Runeson *associate professor*

Karolinska Institute, Department of Clinical Neuroscience, Section for Psychiatry, St Göran's Hospital, S-112 81 Stockholm, Sweden (Bo.Runeson@sps.sll.se)

Competing interests: None declared.

- Jenkins GR, Hale R, Papanastassiou M, Crawford MJ, Tyrer P. Suicide rate 22 years after parasuicide: cohort study. *BMJ* 2002;325:1155.
- Harris EC, Barraclough B. Suicide as an outcome for mental disorders. A meta-analysis. *Brit J Psychiatry* 1997;170:205-28.
- Goldacre M, Seagroatt V, Hawton K. Suicide after discharge from psychiatric inpatient care. *Lancet* 1993;342:283-6.
- Tejedor MC, Diaz A, Castillon JJ, Pericay JM. Attempted suicide: repetition and survival—findings of a follow-up study. *Acta Psychiatr Scand* 1999;100:205-11.
- Soukas J, Suominen K, Isometsä E, Ostamo A, Lönnqvist J. Long-term risk factors for suicide mortality after attempted suicide—findings of a 14-year follow-up study. *Acta Psychiatr Scand* 2001;104:117-21.
- Rygnestad T. A prospective 5-year follow-up study of self-poisoned patients. *Acta Psychiatr Scand* 1988;77:328-31.
- De Moore GM, Robertson AR. Suicide in the 18 years after deliberate self-harm. A prospective study. *Brit J Psychiatry* 1996;169:489-94.
- Runeson BS, Beskow J, Waern M. The suicidal process in suicides among young people. *Acta Psychiatr Scand* 1996;93:35-42.
- Hawton K, Fagg J, Platt S, Hawkins M. Factors associated with suicide after parasuicide in young people. *BMJ* 1993;306:1641-4.
- Waern M, Runeson BS, Allebeck P, Beskow J, Rubenowitz E, Skoog I, et al. Mental disorder in elderly suicides: a case-control study. *Am J Psychiatry* 2002;159:450-5.
- Beautrais AL. Suicides and serious suicide attempts: two populations or one? *Psychol Med* 2001;31:837-45.
- Waern M, Beskow J, Runeson B, Skoog I. Suicidal feelings in the last year of life in elderly people who commit suicide. *Lancet* 1999;354:917-8.

Personal medical services

Have made steady, if unspectacular, progress

Pilot schemes for personal medical services are now in their fourth year. Rapid growth in their numbers means that 22% of England's general practitioners now choose to work in more than 1700 pilot schemes.¹ A national evaluation has recently reported on the progress of the first wave of pilots.² What evidence is there to justify health minister John Hutton's endorsement of personal medical services as "a proven success?"³

Pilots of personal medical services were brought into life by the NHS (Primary Care) Act 1997 and

promptly endorsed by the incoming Blair administration. They are an antidote to the "one size fits all approach" of the national contract for general practice and a response to doctors' dissatisfaction with their traditional employment options.⁴

Yet the pilots amount to more than an alternative contractual framework—they have fundamentally changed the relation between government and general practice. Personal medical services entail local service contracts, negotiated between the provider and primary care trusts. They are subject to local targets,

BMJ 2002;325:1126-7