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Low iron intakes among young women in Britain

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Abstract

A large survey by the Ministry of Agriculture, Fisheries and Food of people aged 15 to 25 showed that the women, and especially the participants "on a diet" or "watching their weight," generally had iron intakes well below the recommended daily allowance. Reduced iron intake appeared to result from diets of reduced iron concentration as well as from energy restriction.

Further research is needed to establish whether this population is compromised or whether the current recommended daily allowances are unnecessarily high.

Introduction

Iron is the least plentiful nutrient, in comparison with its recommended daily allowance, in the average British diet,¹ and anaemia is said to be common in this country. Although there is no direct relation between iron intake and haematological state, there is a relation between iron and energy intake.² Thus when energy is restricted, as in dieting, nutrient intakes may be compromised. This may be particularly so in young women as from adolescence their iron requirements rise while their energy requirements remain relatively constant. Few surveys, however, have been published recently of either the prevalence of anaemia or intake of iron in this age group.

Subjects and methods

The Ministry of Agriculture, Fisheries and Food (MAFF) conducted a detailed study of the dietary intakes of more than a thousand 15 to 25 year olds in a sample that was nationally representative of this age group in terms of social class, region, and education. Each participant recorded, in a precoded diary, the quantity of every item of food and

drink consumed at home or away during 14 consecutive days, if necessary using household measures such as servings, portions, and tablespoons. The nutritional value of their diets was computed using *McCance and Widdowson's The Composition of Foods*, and a series of standard weights generated by MAFF was applied where necessary to the portions recorded. Full details of the methodology of the survey will be published elsewhere.

Results

Of the 506 women recruited, 461 completed diaries; of these, 30 claimed to be "on a diet" at the time and a further 80 "always watched what they ate." One of the major findings among these women was that their intakes of iron were low.

The mean intake for all the women was 8.7 mg a day, compared with a recommended daily allowance of 12 mg or more.³ Fifteen per cent of the women ate less than 6 mg a day over the two weeks, and four women ate less than 3.5 mg a day (30% of the recommended daily allowance).

Age, dieting, and social class were all associated with iron intake (table) and appeared to act independently. The lowest group intake was

Mean (SD) intakes of iron and energy (per person per day) by young women in Britain according to age, dieting habits, and social class

Age (years)	n	Energy (MJ)	Iron		
			mg	Iron/MJ (mg)	Proportion of RDA (%)
“Not on a diet”					
15-18	138	8.1 (2.8)	8.8 (3.1)	1.08	73
19-21	91	7.3 (2.6)	8.6 (3.0)	1.18	72
22-25	109	8.0 (2.7)	9.4 (2.9)	1.19	79
“Watching weight”					
15-18	34	6.9 (2.2)	8.0 (2.8)	1.16	67
19-21	17	6.2 (1.3)	7.6 (1.9)	1.22	64
22-25	29	7.3 (3.7)	9.2 (5.3)	1.25	77
“On a diet”*					
15-18	10	6.5 (2.4)	6.9 (2.1)	1.06	58
19-21	6	5.5 (2.2)	7.2 (2.3)	1.30	60
22-25	14	5.9 (1.5)	8.2 (1.9)	1.38	68
Social class					
AB	65	7.9 (2.7)	9.6 (3.0)	1.21	80
C1	130	7.9 (2.8)	9.2 (3.4)	1.16	77
C2	167	7.5 (2.8)	8.5 (3.1)	1.14	71
DE	99	6.9 (2.5)	7.9 (2.8)	1.15	66
Total	461	7.5 (2.7)	8.7 (3.2)	1.15	73

*Excludes 13 women dieting for reasons other than weight control.
RDA = recommended daily allowance.³

Conversion: SI to traditional units—Energy: 1 MJ $\approx$ 239 kcal.

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for the 15 to 18 year old girls who were dieting, who averaged 6.9 mg a day, or 58% of the recommended daily allowance, throughout the period.

Discussion

In deficiency absorption increases, and in women with these low intakes it may be greater than the 6-7% estimated for the nation as a whole⁴; absorption might, however, need to be as high as 20-30% for several women in this study to meet the recommended daily allowance.

The energy as well as the iron intakes of these women were lower than the 8.0 MJ (1911 kcal) and 10.1 mg recorded by the Department of Health and Social Security (DHSS) for 14 to 15 year old schoolgirls in 1970 and 1971.⁵ The iron intakes in the present study averaged 1.15 mg/MJ compared with 1.27 mg/MJ in the DHSS study and a recommendation equivalent to 1.34 mg/MJ.³ Thus the low iron intakes resulted from diets of reduced iron concentration as well as from energy restriction.

Further research is needed to establish whether the haematological state of this population may be compromised or whether the current recommended daily allowances for iron are unnecessarily high. The results have been referred to the DHSS for consideration.

References

- 1 Ministry of Agriculture, Fisheries and Food. *Household food consumption and expenditure: 1982*. London: HMSO, 1984.
- 2 Herçberg S, Soustre Y, Galán P, Berthier AM, Suquet JP, Dupin H. Apports alimentaires en fer dans une population de femmes françaises en âge de procréer. *Ann Nutr Metab* 1984;28:77-84.
- 3 Department of Health and Social Security. *Recommended daily amounts of food energy and nutrients for groups of people in the United Kingdom*. London: HMSO, 1979. (Special report series No 15.)
- 4 Bull NL, Buss DH. Haem and non-haem iron in British household diets. *Journal of Human Nutrition* 1980;34:141-5.
- 5 Darke SJ, Disselduff MM, Try GP. Frequency distribution of mean daily intakes of food energy and selected nutrients estimated during nutrition surveys of different groups of people in Great Britain between 1968 and 1971. *Br J Nutr* 1980;44:243-52.

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Hepatic sequestration in sickle cell anaemia

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Abstract

Several episodes of acute hepatic enlargement associated with a dramatic fall in haemoglobin concentration were observed in two patients with sickle cell anaemia. No appreciable disturbances of liver function or signs of cardiac failure were evident. The most likely mechanism was sequestration of sickled erythrocytes in the liver. This complication, which may have a basis similar to that of splenic sequestration and the sickle lung syndrome, may be easily overlooked unless the size of the liver is regularly monitored in patients with sickle cell crisis.

Introduction

Patients with sickle cell anaemia may have periodic exacerbations of their illness, often referred to as sickling crises. Usually, these take the form of bone pain without an appreciable fall in the haemoglobin concentration. Less commonly, crises are characterised by dramatic and life threatening anaemia. This may result from transient marrow aplasia due to an intercurrent viral infection¹ or massive sequestration of sickled erythrocytes in the spleen² or pulmonary vasculature.³ Splenic sequestration occurs only in infants and young children.

Although there have been occasional reports of transient hepatic enlargement in patients with sickle cell disease,⁴⁻⁶ this complication has not received much attention in recent years. We describe three episodes of acute hepatic enlargement associated with a rapidly falling haemoglobin concentration in two patients with sickle cell anaemia.

Case reports

CASE 1

A 21 year old Nigerian woman with homozygous sickle cell anaemia was admitted with generalised bone pain; similar episodes had occurred from the age of 10 years. She did not have a fever but was slightly jaundiced, and her liver was just palpable below the right costal margin. Initial investigations showed haemoglobin concentration 8.1 g/dl, white cell count $20.6 \times 10^9/l$, platelet count $531 \times 10^9/l$, reticulocyte count 8.1% , bilirubin concentration $34 \mu\text{mol/l}$ (2.0 mg/100 ml), aspartate transaminase activity 48 IU/l, and alkaline phosphatase activity 255 IU/l. A radiograph of the chest showed cardiac enlargement but no other abnormalities. She was treated with analgesics and intravenous fluids. The following day she was feverish, but the haematological findings were essentially the same. On the third morning her liver was enlarged 8 cm below the right costal margin and her haemoglobin concentration had fallen to 5.6 g/dl, with a reticulocyte count of 15% . Six hours later her liver extended 12 cm below the right costal margin. Liver function tests showed bilirubin concentration $110 \mu\text{mol/l}$ (6.4 mg/100 ml), aspartate transaminase activity 90 IU/l, and alkaline phosphatase activity 275 IU/l. Three units of blood were transfused, and over the next three days the size and function of her liver returned to normal.

A year later she was admitted with bone pain. On this occasion her liver was palpable 5 cm below the right costal margin. The haemoglobin concentration was 5.7 g/dl and reticulocyte count 5% , and results of liver function tests were unremarkable. The following day the liver was enlarged 7 cm below the right costal margin, her haemoglobin concentration was 5.0 g/dl, and the reticulocyte count was 8% . Four units of blood were transfused, and over the next four days her liver returned to normal size.

Five days later she was readmitted with a two day history of passing dark urine and a one day history of pain in the right iliac fossa. She was jaundiced and tender in the right iliac fossa and epigastrium. Her liver was palpable 5 cm below the right costal margin. On admission the haemoglobin concentration was 6.1 g/dl. Her liver enlarged gradually until it was palpable 9 cm below the right costal margin. There were no signs of cardiac failure. Liver function tests showed bilirubin concentration $185 \mu\text{mol/l}$ (10.8 mg/100 ml), aspartate transaminase activity 234 IU/l, and alkaline phosphatase activity 650 IU/l, and a liver scintigram showed generalised hepatic enlargement. Ultrasonography showed a normally contracting and filling gall bladder. Over the subsequent few days her haemoglobin concentration dropped to 4.2 g/dl with a reticulocyte count of 27% , and the liver remained massively

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