Vitamin D in pregnancy: an old problem still to be solved?

A F Williams

In this issue Dijkstra et al describe the high incidence of hypovitaminosis D (serum 25-hydroxyvitamin D <25 nmol/l) amongst infants born in Rotterdam, the Netherlands (latitude 52˚N). Babies born to veiled or dark-skinned mothers were significantly more likely than those of white mothers to have a low 25-hydroxyvitamin D (250HD) concentration in umbilical cord blood. Similarly, a recent study of pregnant women in the Hague found that 36–66% of women of Moroccan and Turkish descent had 250HDC levels <25 nmol/l, compared with 8% of women of Western origin. 1 Given that mainland United Kingdom lies at a latitude of 50˚–58˚N and the populations of its large cities show similar ethnic and cultural diversity, these findings are very relevant to Britain. Indeed amongst Cardiff women from ethnic minority groups attending their first antenatal appointment, half showed a serum 25OHDC concentration <20 nmol/l. 2 Those of Indian or African origin were most likely to be affected, especially women who had arrived in the UK within the last 3 years. Interestingly these problems are not confined to northerly latitudes but occur in sunnier climes as well. 3

We have known for over 30 years that hypovitaminosis D is common amongst pregnant women in ethnic minority groups, particularly those of Asian origin. 4 Intervention studies, including a randomised placebo-controlled trial (amongst women of South Asian origin living in South London) showed that infants of vitamin D supplemented mothers were less likely to be small for gestational age, less likely to develop neonatal hypocalcaemia, and had better tooth enamel mineralisation. 5 Recent epidemiological data have added another perspective to maternal vitamin D status in pregnancy and challenge the widely held assumption that suboptimal vitamin D status in pregnancy is a problem confined to at risk ethnic groups. Amongst white women living in Southampton (at one of the most southerly latitudes of the United Kingdom) maternal 250HDC concentrations in the third trimester of pregnancy correlated significantly with the child’s whole body and lumbar spine bone mineral content at the age of 9. Eighteen per cent of these mothers showed a 250HDC concentration <28 nmol/l at parturition. Although no national data exist for pregnant women, the low status of UK women of childbearing age is borne out by the National Diet and Nutrition Survey of British adults: 28% of women aged 19–24 and 13% of those aged 25–34 had plasma 25OHDC concentrations <25 nmol/l. These findings suggest that infants who present clinically with vitamin D deficiency, either in the neonatal period or later with clinical rickets, represent only a small proportion of those with suboptimal vitamin D status.

How can the risk of vitamin D deficiency in pregnancy, and by implication in infancy, be reduced? In 1991 the Committee on Medical Aspects of Food and Nutrition Policy (COMA) set a reference nutrient intake (RNI) of 10 µg/day (400 IU/day) vitamin D for women who are pregnant or breast feeding. 6 This amount was chosen as sufficient to maintain plasma 25HD >20 nmol/l during the winter months in Scotland and was endorsed by COMA as recently as 1998. 7 Whilst sunlight exposure is generally of greater importance than diet in the maintenance of vitamin D status, there is no ambient ultraviolet light of the appropriate wavelength at UK latitudes during the winter months. For this reason maintenance of adequate vitamin D status in pregnancy is best achieved through dietary means. However, the average dietary vitamin D intake of young women in the UK approximates 3 µg/day and fewer than 1% consume more than the 10 µg RNI. 8 Achieving the RNI therefore necessitates supplementation. The advice applies to all women and not merely those in ethnic minority groups, yet very few women take a vitamin D supplement during pregnancy and an individual woman’s risk of deficiency in pregnancy seems rarely to be assessed.

Unfortunately there have been many barriers to policy implementation. These
include a lack of public and professional awareness, limited availability of suitable supplements which omit retinol (vitamin A) and inconsistency in guidance. In 2003 NICE concluded that “vitamin D supplementation should not be offered routinely to all pregnant women”. 10 This view clearly conflicts with the COMA opinions cited above and was based on a meta-analysis of two randomised trials, one of which was conducted in the UK and showed important effects. The Department of Health later stressed the continued importance of offering vitamin D supplements to pregnant women, particularly those in vulnerable groups.11

Some time ago a public education campaign conducted amongst at risk groups in Glasgow demonstrated effectiveness in terms of both increased uptake of supplements and a reduction in rickets,12 but a recurring and commonly cited concern has been a lack of public and professional awareness.13 The Glasgow campaign conducted amongst at risk groups in 2003;14

ACKNOWLEDGEMENTS

I am extremely grateful to Dr Sheela Reddy and Dr Ann Prentice for their comments on the manuscript.

Correspondence to: A F Williams, Department of Child Health, Division of Clinical Developmental Sciences, St George’s Hospital Medical School, University of London, Cranmer Terrace, London, SW17 0RE, UK; awilliam@sgul.ac.uk

Competing interests: None.

REFERENCES

16 Holli BW, Wagner CL. Vitamin D requirements during lactation: high-dose maternal supplementation as therapy to prevent hypovitaminosis D for both the mother and the nursing infant. Am J Clin Nutr 2004;80(6 Suppl):1752S–5S.

PERSPECTIVES

Vitamin K deficiency bleeding: the readiness is all

Paul Clarke, Martin J Shearer

Perspective on the papers by Busfield et al and McNinch et al (see pages 954 and 959)

Over 10 years ago, William Hathaway described the 50-year chequered history of the association between a neonatal bleeding disorder and vitamin K deficiency and its prevention as a splendid example of the cyclical nature of discovery–rediscovery in medical science.1 The lessons that should have been learnt from the extensive body of early work were reiterated in a recent lively review in this journal.2 In the UK these forgotten lessons first surfaced in a 1983 Lancet article entitled “Haemorrhagic disease of the newborn returns to the UK”.3 Of course this rare deficiency syndrome, now more accurately termed vitamin K deficiency bleeding (VKDB), had never gone away but had merely been rediscovered at a time of a progressive trend towards exclusive breast feeding. The latter had long since been established as an important risk factor for neonatal hypoprothrombinemia.4

Vitamin K deficiency

www.archdischild.com
Vitamin D in pregnancy: an old problem still to be solved?

A F Williams

Arch Dis Child 2007 92: 740-741
doi: 10.1136/adc.2007.120774

Updated information and services can be found at:
http://adc.bmj.com/content/92/9/740

These include:

References
This article cites 12 articles, 8 of which you can access for free at:
http://adc.bmj.com/content/92/9/740#BIBL

Email alerting service
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Topic Collections
Articles on similar topics can be found in the following collections

- Calcium and bone (78)
- Pregnancy (528)
- Reproductive medicine (945)
- Childhood nutrition (712)
- Childhood nutrition (paediatrics) (396)
- Diet (325)
- Child health (3922)
- Infant health (811)
- Infant nutrition (including breastfeeding) (405)
- Malnutrition (176)
- Coma and raised intracranial pressure (67)
- Dentistry and oral medicine (147)
- Metabolic disorders (761)
- Rheumatology (521)
- Editor's choice (146)

Notes

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/