

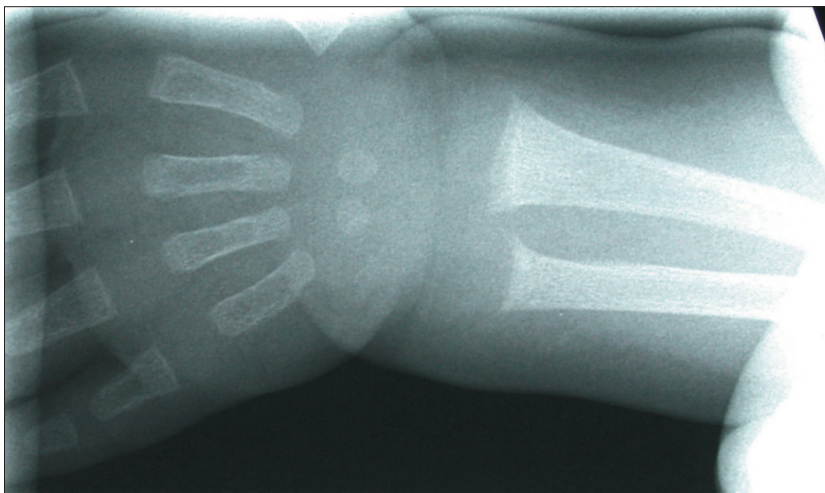
# The first reported presentation of rickets with metabolic seizures

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### INTRODUCTION

A breast-fed infant presented to the emergency room with witnessed tonic-clonic seizures. Appropriate laboratory investigations performed at that time revealed hypocalcaemia. The diagnosis was confirmed by a wrist X-ray that demonstrated the characteristic appearance of rickets (*Figure 1*). Although the patient had remained in this coun-

*Figure 1. The radiological appearance of rickets in the wrist of this child. The growth plates are widened and the metaphyses cupped and ragged.*



try since birth, this case highlights that malnutrition still occurs in developed countries, particularly in individuals from other countries.

### DISCUSSION

Seizures secondary to rickets have not been previously reported although hypocalcaemia secondary to vitamin D deficiency in breast-fed infants should be considered as part of the differential diagnosis. Tetany, laryngospasm and stridor have been described in this setting (Train et al, 1995; Halterman and

Smith, 1998) and laboratory testing including calcium levels are recommended for infants who are actively seizing in the emergency department and who have a temperature of less than 36.5°C, or are less than 1 month of age (Scarfone et al, 2000).

There has been a resurgence of rickets among Asians living in the UK and it has been suggested that public health campaigns target pregnant mothers who may be deficient antenatally because of a lack of sunlight. In addition it is noteworthy that the use of formula feeds in infancy does not always preclude the development of rickets (Pal, 2001). Reports of florid rickets in childhood occur in children who had been breast fed for a prolonged period without vitamin D supplementation (Mughal et al, 1999). The metabolic changes may be exacerbated in individuals from other countries as increased skin pigmentation reduces the capacity of skin to synthesize vitamin D (Clemens et al, 1982).

Calcium levels are normally tightly regulated by the interdependent actions of parathyroid hormone, vitamin D and calcitonin and the fetal build up of minerals starts at 24 weeks, leading to peak accretion at 34–36 weeks gestation. Early onset hypocalcaemia, within 48 hours of birth may be caused by prematurity, asphyxia, maternal diabetes mellitus or maternal use of anticonvulsants. Late onset hypocalcaemia as in this case is often caused by a sub-optimal intake that begins after birth but may take months to manifest. It may also be caused by secondary hyperparathyroidism related to hypomagnesaemia or even hyperphosphataemia caused by enemas (Walton et al, 2000).

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### CASE REPORT

**A** 5-month-old Afro-Caribbean infant presented to the accident and emergency department in December 2000 following a tonic-clonic seizure that lasted 5 minutes. He had been born by normal vaginal delivery and remained fully breast-fed. He had no past medical history of note and in particular no previous history of fits or abnormal movements. There was no family history of epilepsy.

He was afebrile, with normal observations. His examination was normal, and he was playful throughout. Just as the examination was ending, he began to have a further tonic-clonic seizure lasting 30 minutes eventually responding to intravenous lorazepam. A blood gas at this time showed a metabolic acidosis, which was corrected after two fluid boli. Blood glucose, full blood count, routine electrolytes and a computed tomography (CT) scan of the brain were normal. Following his CT scan, his corrected calcium level measured 1.44 mmol/litre with an alkaline phosphatase of 1957 u/litre (normal range 30–3000 u/litre). Further detailed inspection revealed that his distal forearms and wrists were minimally swollen. A radiograph showed splaying, fraying and cupping of his distal radius and ulna (*Figure 1*) and the diagnosis of rickets secondary to nutritional deficiency was made. He was immediately treated with intravenous calcium followed by oral calcium and 3000 u/day ergocalciferol supplements and no further seizures have occurred.

In infants and small children the features of vitamin D deficiency include lethargy, recurrent respiratory tract infections, arrhythmias, stridor, tetany and in this case rickets and convulsions. In the long term nutritional deficiencies may manifest with developmental delay (Terhakovec and Stallings, 1998).

## CONCLUSION

Infants with chronic illnesses including nutritional deficiencies constitute almost a quarter of the total world population of children. Even in the West, it is estimated that 10–15% have nutritional problems that are often undiagnosed but that are severe enough to interfere with everyday activities (Barnes, 1983; Terhakovec and

Stallings, 1998). Nutritional deficiencies such as rickets usually present to primary care physicians but clinical signs such as genu varum and intoeing will not be present in infants who are not weight-bearing, as in this case. With the current emphasis on the benefits of breast-feeding and limitation of sunlight, symptomatic hypocalcaemia in childhood may become more common. Afebrile children who have seizures should have their calcium measured. The old maxim, that it is far more common to have a rare presentation of a common illness than a common presentation of a rare illness, still applies. **HM**

Barnes LA (1983) Nutritional disorders. In: Nelson ME, Behrman RE, Vaughan VC, eds. *Textbook of Paediatrics*. 12th edn. WB

Saunders, Philadelphia: 179–84  
Clemens TL, Adams JS, Henderson SL, Holick MF (1982) Increased skin pigment reduces the capacity of skin to synthesise vitamin D3. *Lancet* **i**: 74–6  
Halterman JS, Smith SA (1998) Hypocalcaemia and stridor. An unusual presentation of vitamin D-deficient rickets. *J Emerg Med* **16**: 41–3  
Mughal MZ, Salama H, Greenaway T, Laing I, Mawer B (1999) Florid rickets associated with prolonged breast feeding without vitamin D supplementation. *BMJ* **318**: 39–40  
Pal BR (2001) Rickets resurgence in the United Kingdom: Improving antenatal management in Asians. *J Pediatr* **139**: 337–8  
Scarfone RJ, Pond K, Thompson K (2000) Utility of laboratory testing for infants with seizures. *Pediatr Emerg Care* **16**: 309–12  
Train JJA, Yates RW, Sury MRJ (1995) Lesson of the week: Hypocalcaemic stridor and infantile nutritional rickets. *BMJ* **310**: 48–9  
Terhakovec AM, Stallings VA (1998) Nutrition. In: Behrman RE, Kliegman RM, eds. *Nelson Essentials of Pediatrics*. 3rd edn. WB Saunders, Philadelphia: 58–93  
Walton DM, Thomas DC, Hany AZ, Short BL (2000) Morbid hypocalcaemia associated with phosphate enema in a six-week old infant. *Pediatrics* **106**: E37

## IN THE PUBLIC'S VIEW...

# Screening: if you look, you will find

**D**o you remember the old school playground riddle? 'What was the largest island in the world until Greenland was discovered?' Whatever answer was given, it would be greeted with hoots of laughter because the answer was, of course, 'Greenland'. Existence doesn't depend on discovery. But now, the media have picked up the latest figures from the Office for Cancer Statistics, which show that prostate cancer has become the most common cancer in men in the UK, with the most new cases discovered each year.

The *Independent's* story (27 September) was sensible and balanced. It explained that screening inevitably increases incidence, and reported the recent study from the *New England Journal of Medicine* showing no difference in mortality between radical prostatectomy and 'watchful waiting'. In this, the *Independent* did better than some other newspapers, notably in the USA. There, a common headline was that fewer men who had had surgery died of prostatic cancer: but once you're dead, you're dead.

The prostate cancer screening lobby is powerful in the USA. It earns lots of

dollars. Anyone arguing against routine screening is liable to be accused of 'geronticide'. There are some lessons from prostate cancer worth learning when comparisons about cancer are made between countries.

We are repeatedly told that cancer treatment in the UK is sub-standard, but are we comparing like with like? The 5-year survival from prostate cancer in the US is 80% (one website gives it as 93%); here it is 45%. This difference is largely an artefact of early diagnosis of cancers that would otherwise only be detected at post-mortem (if relatives were not scared off by the consent form).

As the *Boston Herald* starkly put it when reporting a study of a genetic marker for aggressive prostate cancer (10 October), 'many men over 60 receive unnecessary surgery and other treatments for prostate cancer that is unlikely to spread. Prostate surgery can cause impotence and incontinence'. I don't know whether that will have changed the mind of the columnist for the *Chicago Sun-Times* who wrote (14 June 2001) that children should give their fathers greetings cards with a prostate cancer

awareness message, helpfully supplied by the Cancer Society.

Research into the consequences of screening for prostate-specific antigen is important, both for public health and for individual men. Not all research is so useful, and some makes one wonder who thought up the question in the first place.

A number of newspapers reported a study whose conclusion was that people who are happier and more outgoing as children tend to die younger. This outcome was not entirely explained by extraverts tending to smoke and drink more and to be more likely to take up para-gliding and extreme skiing. Now, without reading the original paper, I don't know exactly what hypothesis the researchers were testing, or even if they were testing any hypothesis at all. But it rather reminds me of the answer given to the man who asks his doctor whether he will live longer if he doesn't smoke, doesn't drink, gives up meat, and always goes to bed early. 'Not necessarily,' replies the doctor, 'but it'll certainly seem like it'. **HM**

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