CASE REPORT PROF-1192

SCURVY;
RADIOLOGICAL DIAGNOSIS

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ABSTRACT... Hypervitaminosis and hypovitaminosis occur in children in our country mainly due to socioeconomic reasons. Most common being the rickets due to vitamin D deficiency, however scurvy is also not uncommon and radiological changes suggestive of scurvy are occasionally seen. Three cases of scurvy are presented here, between one and three years of age, showing typical radiological changes especially in knees. Good history, physical examination and quality X-rays are essential for making diagnosis of scurvy.

Key word: Scurvy, vitamin C.

INTRODUCTION

It should come as no surprise that scurvy still occurs. Poor dietary intake of vitamin C in relation to body requirement in children is the main causes of scurvy[1]. This mismatch between demand and supply can occur from a number of reasons. Some children exhibit strict food preferences which exclude fresh fruits and vegetables from their diet. Infants and small children cannot chew fresh fruits and vegetables. They are not given fruit juices due to economic and social reasons. Children suffering from mental retardation or cerebral palsy do not get balanced diet due to ignorence[2]. It is a well known fact that acute illness and stress enhance ascorbic acid depletion. The onset of scurvy usually occurs between six month and two years of age but disease is rare in adults, presenting as osteoporosis. Radiologically earliest sign are in knees. Diagnosis of scurvy is based mainly on history of a poor intake of vitamin C, clinical picture and radiographic changes in the long bones[3,8]. Biochemical evidence of vitamin C deficiency is documented by ascorbic acid level in the white blood cells-platelet layer (buffy layer) of centrifuged oxalated blood.

CASE REPORT

Three cases are being documented between ages one and three years detected in radiology department during a period of one year (2005-06) at CMH Panu Akil and Kharian.

CASE:1

A three years old boy was admitted with intermittent fever and cough of two months duration. His milestones were normal. His two brothers and two sisters had died between the ages of six to eighteen months due to febrile diarrhoeal illness. He was breastfed for two years. Weaning was started at the age of nine months. He was vaccinated. He disliked fruit and vegetables and took only rice, boiled milk and sweets. Being a precious baby parents compiled with his food preference. He was pale, anemic and irritable. His gums were bluish purple, swollen and spongy with frequent bleeds. Purpuric spots were present on legs and trunk, spleen was enlarged and firm. Knees were swollen and tender. X-ray of knees revealed osteopenia, decreased epiphyseal density, thin cortex and dense zone of provisional calcification. Metaphyseal corner fractures were noted at lower ends of both femurs. These radiological findings were diagnosis of scurvy.

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CASE:2

A one-year old malnourished girl was admitted to hospital with pneumonia. While she was being treated for her pneumonia, she developed painful swelling of her knee joints. At the same time, she developed purpuric and ecchymotic spots all over her body, raising suspicion of disseminated intra vascular coagulation, however her coagulation profile was normal. X-ray of both knees revealed finding consistent with scurvy.

CASE:3

A three year old girl was suffering from ulcerative colitis. Whenever her symptoms of colitis exacerbated she developed painful swelling of her elbow, wrists and knees. The swelling subsided with the remission of her abdominal symptoms. Reactive arthritis was suspected, however X-ray of swollen knees revealed typical changes of scurvy. She responded to vitamin C therapy but remissions and relapses of ulcerative colitis continued.

DISCUSSION

Scurvy had occurred in epidemics during the period of renaissance and in the 19th century among those who were under privileged. An epidemic of scurvy has been confirmed in Afghanistan in May 2001[4]. In Pakistan 48% of children less than 5 years of age suffer from malnutrition. Thirty to 70% of children between the age seven months and 17 months do not take the diet that other family members take. They only take boiled milk and small amounts of cereals. They are not given fresh fruit juices due to poverty and lack of knowledge[5,6]. In such circumstances, it should be no surprise to find scurvy even in the 21st century. Scurvy is a disease with a rich history and an ancient past. Its symptoms were recorded as early as 1550 B.C. by the Egyptians. Francis Glisson demonstrated the earliest case of infantile scurvy in 1650 [5,6]. In 1747 a British naval surgeon James Lind, demonstrated the fact lemons and organs cured scurvy. Thomas Barlow described the pathological and clinical features of infantile scurvy in 1883. Holst and Frolich induced and cured scurvy by dietary modification in guinea pigs between 1907 and 1912. In 1914 Alfred Hess established that heating milk reduced anti scorbutic value of milk [6,7]. There is no racial or sex predilection for scurvy, which can occur at any age, however it is uncommon in neonates. The need for vitamin C is increased during infections, diarroheal illness, cold exposure, iron deficiency and protein depletion[8,10]. Formation of collagen and chondroiton sulphate is impaired which explains many clinical features of scurvy. Wound healing is delayed, swollen joins and hyperkeratosis occurs. The patient may develop xerostomia, Kertoconjuctivitis and enlarged salivary glands[7,8,9].

RADIOLOGICAL CHANGES IN SCURVY

Diagnosis of scurvy is based mainly on history of poor intake of vitamin C, clinical picture and the radiographic appearance of long bones. Following radiological changes are typical of scurvy [10,11]:-

- Osteoporosis mainly around joints, earliest seen in knees.
  Loss of epiphyseal destiny with a pencil-thin cortex (Wimburger's sign)
- Dense zone of provisional calcification at the growing metaphses giving a while line (Frankel's line)
- Transverse metaphyseal lucent band due to lack of mineralization of osteoid (Trummerfeld zone)
- Metaphyseal corner fractures (Pelkan's spur) through the weakened lucent metaphyses resulting in cupping of bone ends.
- Periosteal reaction due to subperiosteal hematoma.
- Following treatment, dense bands of bone may be left, resembling growth arrest lines.

CONCLUSION

The three patients mentioned above were suffering from some other illness and scurvy occurred as a result of their increased requirement of vitamin C due to stress of illness combined with poor dietary intake. All presented with swollen joints especially knees with typical radiological changes of scurvy mentioned above. It is therefore recommended that during illness one should be

careful about the intake of vitamin C, keeping in mind that acute illness rapidly depletes stores os ascorbic acid. Those already malnourished are more prone to this development. X-ray of the swollen joints are very helpful in making a specific diagnosis of scurvy. Clinical should remain aware of this potential fact that easily curable disease which is still encountered in our young population.

REFERENCE

1. Ghorbani AJ, Eichler C. Scurvy. J Am Acad Dermatol 94; 30(5): 881-3
2. Weinstein M, Babyn P, Zlotkin S. **An orange a day keeps the doctor** away**:** Scurvy in year 2000. Pediatrics. 2001: 108 (3): E55.
3. Hurlimann r, Salomon F. **Scurvy-** a mistakenly forgotten disease. Schweiz Med Wochenschr 1994: 124 (31-32): 1373-80.
4. Outbreak of scurvy confirmed in Northern Afghanistan 25 May 2001, article from: http://www.afghan.web.com.
5. Executive Summary In: National Nutrition survey 1985-87. Nutrition Division, National Institute of Health. Government of pakistan:ix.
6. Rajakumar K. **Infantile Survey: A Historical Perspective,** Pediatrics 2001; 108 (4): E 76.
7. Curran J S, Barness L A. Nutrition In: Behrman R E, Kleigman R M, Jenson H A, eds. **Nelson textbook of Pediatrics, sixteen edition.** W B Saunders Company, Philadelphia 2000; 182-184.
8. Stephen R, Utecht T. **Scurvy identified in the emergency department: A case report.** J Emerg Med 2001; 235-7.
9. Mimasaka S, Funayama M, Adachi N, Nata M, Morita. **A fatal case of infantile scurvy.** Int J legal Med 2000; 114 (1-2): 122-4.
10. Sutton, D. **Textbook of Radiology and Imaging,** Vol-2, seventh edition, 1356, 2003.
11. Grainger R G, Allison DJ, **Diagnostic Radiology A Text Book of Medical Imaging,** 3rd edition 2002.