

Rickets: A disease of the past or a resurgent cause of waddling gait in children?

Lily Li, Gajendiran Thiruchandran, Peter Hope

ABSTRACT

Introduction: Rickets as a cause of bone pain and lower limb deformity was largely thought to be eradicated from the UK and is now commonly thought to be a disease of the past; however, in the last few years there has been a resurgence of cases. **Case Report:** We present a case of lower limb deformity caused by childhood rickets presenting with apparently healthy diet. This child had been referred to a specialist orthopaedic clinic with leg deformity, and was found to have typical clinical and radiographic features consistent with nutritional vitamin D deficiency. **Conclusion:** Rickets should no longer be thought of as a disease of the past but should be considered as a cause of waddling gait. It should not be excluded as a cause of bone pain and lower limb deformity even in children taking healthy diets.

Keywords: Children, Rickets, Orthopedics, Nutrition, Pediatrics, Vitamin D deficiency

Lily Li¹, Gajendiran Thiruchandran², Peter Hope³

Affiliations: ¹MA(Cantab) MB/Bchir MRCS (Eng), Orthopaedic Registrar, Department of Trauma & Orthopaedics, St Mary's Hospital, Imperial College Healthcare Praed St, London, W2 1NY, UK; ²MBBS BSc, Core Surgical Trainee, Department of Trauma & Orthopaedics, Conquest Hospital, Hastings, UK; ³FRCS, MBBS, Consultant orthopaedic Surgeon, Department of Trauma & Orthopaedics, Lister Hospital, Stevenage, UK.

Corresponding Author: Lily Li, MA(Cantab) MB/Bchir MRCS (Eng), Orthopaedic Registrar, Department of Trauma & Orthopaedics, St Mary's Hospital, Imperial College Healthcare Praed St, London, W2 1NY, UK; Email: lily.li.imperial.nhs.uk

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INTRODUCTION

Rickets as a cause of bone pain and lower limb deformity was largely thought to be eradicated from the UK and is now commonly thought to be a disease of the past. However, in the last few years there has been a resurgence of cases. The problem was so widespread that in 2011 the Chief Medical Officer recommended that all children aged six months to five years should be given vitamin D supplements, particularly during winter months [1]. We hope that this case not only raises awareness of vitamin D deficiency in non-typical presentations and clinical settings but that it also reminds readers to think of this oft-forgotten diagnosis and its ease of treatment.

CASE REPORT

A two-year-old Asian girl presented to a pediatric orthopedic clinic with an immature, hesitant gait. She first walked unaided at 11 months but was unable to run or hop. She was otherwise fit and well and there was no significant past medical, social or family history. She had a healthy diet, and was fed both breast and cow's milk,

yoghurt and also Indian food including rice and lentils. Physical examination revealed internal tibial torsion and tibia vara with palpable bony swellings over the distal anterior tibial metaphyses and distal radii.

Investigations

1. Tibia/fibula radiography demonstrated widespread metaphyseal cupping and splaying of the epiphyses (Figure 1)
2. Laboratory evaluation confirmed nutritional rickets.

Differential Diagnosis

1. Congenital and developmental bowing
2. Blount disease
3. Neurofibromatosis
4. Skeletal dysplasia

Treatment

Treatment with ergocalciferol and calcium supplementation was commenced.

Outcome and Follow-Up

The child's vitamin D level normalized after seven months and she returned to normal mobilization. She was commenced on prophylactic vitamin D and discharged from specialist care.

DISCUSSION

Rickets can be defined as the softening and deformity of bones, particularly the long bones, in children caused by vitamin D deficiency. It is characterized by soft skull bones (craniotabes), costochondral swelling (rachitic rosary) and bowed legs. It may also cause bone pain, pseudofracture and short stature [2].

Rickets has many causes. The primary cause is dietary vitamin D deficiency which occurs particularly in children with pigmented skin and in Northern climates where sunlight is minimal. Vitamin D deficiency can also be due to other disease processes, such as malabsorption, liver disease, renal tubular disorders or chronic renal failure. Two other rarer causes include vitamin D dependent rickets and hyperphosphataemic rickets (vitamin D resistant rickets). Vitamin D dependent rickets is an autosomal recessive disorder resulting in an enzyme deficit in the metabolism of vitamin D. Hyperphosphataemic rickets is an X-linked dominant trait resulting in decreased proximal renal tubular resorption of phosphate. Vitamin D promotes the absorption of calcium and phosphate and thus vitamin D



Figure 1: Radiograph left shows metaphyseal cupping and epiphyseal splaying; right shows resolution after treatment.

deficiency will cause a reduced absorption of calcium and phosphate, resulting in soft and deformed bones [3].

Rickets was largely thought to be eradicated from the UK, however, in the last few years there has been a resurgence of cases. There are myriad reports in professional and public journals highlighting this resurgence. The problem is so widespread that the Chief Medical Officer has recommended all children aged six months to five years should be given vitamin D supplements, particularly during winter months. The lack of exposure to sunlight through the extensive use of sunscreen and children spending more time indoors is thought to be behind the re-emergence of rickets.

CONCLUSION

Rickets should no longer be thought of as a disease of the past but should be considered as a cause of waddling gait in children. It should not be excluded as a cause of bone pain and lower limb deformity even in children presenting with healthy diets. We hope that this case raises awareness of vitamin D deficiency in non-typical presentations and clinical settings and also reminds readers to think of this oft-forgotten diagnosis and its ease of treatment.

LEARNING POINTS/TAKE HOME MESSAGES

- Lower-extremity bowing is common in children. Causes include rickets, congenital and developmental bowing, Blount's disease, neurofibromatosis and skeletal dysplasias.
- Rickets should no longer be thought of as a disease of the past but should always be considered as a cause of waddling gait in children.

- Rickets should not be excluded as a cause of bone pain and lower limb deformity even in children presenting with healthy diets.
- The treatment of rickets is simple and easy with ergocalciferol and calcium supplementation.

Author Contributions

Lily Li – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Gajendiran Thiruchandran – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Peter Hope – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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