Clinical Surgery Journal

Case Report | Vol 3 Iss S4

Inadequately Treated Vitamin D-Deficiency Nutritional Rickets Complicated by Genu Varum: Correlation with High Alkaline Phosphatase

Aamir Jalal Al Mosawi

Children Teaching Hospital Baghdad Medical City, Iraq

Correspondence should be addressed to Aamir Jalal Al Mosawi, almosawiAJ@yahoo.com

Received: October 15, 2020; Accepted: November 06, 2020; Published Date: November 12 2020

ABSTRACT

BACKGROUND

Vitamin D-deficiency, nutritional rickets has become increasingly rare in the modern medicine, environment and its diagnosis has been increasingly missed resulting in unsatisfactory treatment and the development of deformity. The aim of this paper has reported the case of nutritional rickets diagnosed by interning at the age of one year, but was treated inadequately with subsequent development of the genu varum.

PATIENTS AND METHODS

A five-year old girl with genu varum caused by inadequately treated nutritional rickets was studied.

RESULTS

A girl was diagnosed as having nutritional rickets by an internist who treated her with various vitamin D preparations intermittently for about four years. The lowered serum calcium and phosphorus were normalized by treatment. However, radiological cure of rachitic changes has not been demonstrated and serum alkaline phosphatase remained high. When the girl was first referred to us because of genu varum at the age of five years, she was still having radiological evidence of rickets confirming that her treatment for about four years by an adult internist was inadequate. Radiographs of the wrist mild rachitic changes and provisional zone of calcification indicating treated rickets. Serum calcium and serum phosphorus were both normal. Serum alkaline phosphatase was high. The girl was referred to the opinion about the need of an orthopedic corrective surgery, and we recommended treatment with vitamin D with the aim of curing the radiological changes and normalizing serum alkaline phosphatase before considering an orthopedic corrective surgery.

CONCLUSION

Satisfactory treatment of nutritional rickets that have a high likelihood of preventing genu varum should aim at early achievement of the rachitic changes on radiographs and normalization of serum alkaline phosphatase in addition to serum calcium and phosphorus.

Citation: Aamir Jalal Al Mosawi, Inadequately Treated Vitamin D-Deficiency Nutritional Rickets Complicated by Genu Varum: Correlation with High Alkaline Phosphatase. Clin Surg J 3(S4): 33-35.

KEYWORDS

Nutritional rickets; Genu varum; Serum alkaline phosphatase

INTRODUCTION

Nutritional rickets is caused by Vitamin D-deficiency which leads to insufficient calcification of the growth plate and weak bones. Diagnosis generally depends on blood finding low calcium, low phosphorus, and a high alkaline phosphatase in association with rachitic changes on with X-rays, which include widening of the metaphyses which is attributed to poorly mineralized osteoid, cupping, fraying, and splaying of metaphyses [1-3].

Genu varum condition may present from infancy through adulthood and has a wide variety of causes. As it becomes more severe, the patient may exhibit lateral knee thrust and a waddling gait. It is widely recognized that up to age 2 years, infants may have physiologic bowing of the lower extremities. The hallmark of this condition is symmetrical and painless bowing, usually associated with in-toeing and often with a propensity for tripping. Low 25-(OH)D levels, at least during winter-spring, combined with additional risk factors such as very low calcium/milk intakes and possibly digestive disorders, are associated with an increased risk of genu varum [1-5].

Vitamin D-deficiency, nutritional rickets has become increasingly rare in the modern medicine, environment and its diagnosis has been increasingly missed resulting in unsatisfactory treatment and the development of deformity [2,4]. The aim of this paper has reported the case of nutritional rickets diagnosed by interning at the age of one year, but was treated inadequately with subsequent development of the genu varum.

PATIENTS AND METHODS

A five-year old girl with genu varum caused by inadequately treated nutritional rickets was studied.

RESULTS

A girl was diagnosed as having nutritional rickets based on biochemical tests and wrist radiograph by an internist who treated her with various vitamin D preparations intermittently for about four years. The girl didn't have a family history of a similar condition, nor have evidence of malabsorption or renal or vitamin D resistant rickets as renal function tests and electrolytes were both normal and the lowered serum calcium and phosphorus were normalized with treatment. However, radiological cure of rachitic changes has not been demonstrated and serum alkaline phosphatase remained high.

Figure 1: The girl was first referred to us because of genu varum at the age of five years.

When the girl was first referred to us because of genu varum at the age of five years (Figure 1), she was still having radiological evidence of rickets confirming that her treatment for about four years by an adult internist was inadequate. Radiographs of the wrist (Figure 2), showed evidence of mild metaphyseal widening with mild cupping and frying and provisional zone of calcification indicating treated rickets. Serum calcium was 9.8 mg/dL (Normal: 8.6-10.4 mg) and serum

phosphorus was 4.17 mg/dL (Normal: 2.5-4.5 mg). Serum alkaline phosphatase was 243 mg/dL (Normal: 40-129 mg). The girl was referred to the opinion about the need of an orthopedic corrective surgery, and we recommended treatment with vitamin D with aim of curing the radiological changes and normalizing serum alkaline phosphatase before considering an orthopedic corrective surgery.

Figure 2: Radiographs of the wrist showed evidence of mild metaphyseal widening with mild cupping and frying and provisional zone of calcification indicating treated rickets.

DISCUSSION

Kaper, Romness, and Urbanek (2000) from Arizona in the USA, described four cases of nutritional rickets diagnosed by orthopedic physicians during a 3-year period. The patients were referred by pediatricians because of bowlegs.

Sakamoto et al (2018) studied thirty-five children with nutritional rickets and genu varum with the aim of determining the risk for the progression of genu varum. Two patients had rickets, showing abnormalities in blood test, high serum alkaline phosphatase and radiographs showing rachitic changes including cupping, fraying or splaying. Five of 35 children showed abnormalities on blood tests, but not radiographs changes. They found that genu varum is associated with the high alkaline phosphatase level, regardless of the presence of radiographic abnormalities in the growth plate [5].

CONCLUSION

Satisfactory treatment of nutritional rickets that have a high likelihood of preventing genu varum should aim at early achievement of the rachitic changes on radiographs and normalization of serum alkaline phosphatase in addition to serum calcium and phosphorus.

REFERENCES

1. Elder CJ, Bishop NJ (2014) Rickets. The Lancet 383(9929): 1665-1676.
2. Creo AL, Thacher TD, Pettifor JM, et al. (2017) Nutritional rickets around the world: an update. Pediatrics and International Child Health 37(2): 84-98.
3. Cheema JI, Grissom LE, Harcke HT (2003) Radiographic characteristics of lower-extremity bowing in children. Radiographics 23(4): 871-880.
4. Kaper BP, Romness MJ, Urbanek PJ (2000) Nutritional rickets: Report of four cases diagnosed at orthopaedic evaluation. American Journal of Orthopedics 29(3): 214-218.
5. Sakamoto Y, Ishijima M, Kinoshita M, et al. (2018) Association between leg bowing and serum alkaline phosphatase level regardless of the presence of a radiographic growth plate abnormality in pediatric patients with genu varum. Journal of Bone and Mineral Metabolism 36(4): 447-453.