

# ASSESSMENT OF CHILDREN WITH RICKETS AT SAIDU TEACHING HOSPITAL SWAT

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## ABSTRACT

**Background:** Rickets is recognized for centuries and is due to defective mineralization of the growth plate in growing children. Nutritional vitamin D deficiency rickets remains the most prevalent cause worldwide. This study was carried out with the objectives to assess the prevalence, clinical presentation and predisposing factors of rickets in children of Swat District.

**Material & Methods:** This cross-sectional descriptive study was conducted in Department of Child health, Saidu Teaching Hospital, Swat from December 2009 to December 2010. Children presenting with signs and symptoms of rickets from newborns to fifteen years of age were included in the study. Patients with hepatic and renal diseases or on anticonvulsant medicines were excluded from the study. Provisional diagnosis was made after taking detailed history including predisposing factors and a thorough examination and the findings were entered to pre planned proforma.

**Results:** Fifty children with rickets were included. These patients presented as recurrent lower respiratory infections in 30(60%), delay in motor mile stone in 12(24%), convulsions in 10(20%) and recurrent diarrhea in 8(16%) children. On clinical examination skeletal changes were present in 45(90%) and radiological signs 40(80%) children. In all cases healing took place after vitamin D supplementation. The main predisposing factors were lack of awareness about sun exposure, malnourishment and antenatal factors.

**Conclusion:** Rickets is common in district swat presenting with different signs and symptoms predisposing the childhood population to different illnesses and skeletal deformities.

**KEY WORDS:** Rickets, Malnutrition, Vitamin D deficiency.

## INTRODUCTION

Rickets has been described as early as second century AD in Roman children when Soranus of Ephesus wrote about it in his book 'A Treatise on the Diseases of Women'.<sup>1</sup> Hippocrates also described a disease which bore resemblance to rickets in 130 AD.<sup>2</sup> More recently Francis Glisson published a detailed account of rickets in English children (1651).<sup>3</sup> In the early 20th century the healing power of sunshine was established and subsequently the chemical structure of vitamin D was identified by Adolf Windaus in 1930.<sup>4</sup> Vitamin D deficiency has re-emerged as a significant public health problem in UK and other developed countries in recent years.<sup>5,6</sup> Nutritional vitamin D deficiency is the commonest cause in the absence of any malabsorption or disorder of liver, kidneys or vitamin D metabolism. Vitamin D in our body is mainly (80%) derived from the action of ultraviolet – B rays in the sunlight on 7-dehydrocholesterol in the skin and the rest (20%) comes from diet. Foods rich in vitamin D are fish oils and eggs. Cutaneous synthesis of the vitamin may be limited by clothing, use of sunscreen, increased skin pigmentation and atmospheric pollution.<sup>7</sup> Due to

vitamin D deficiency newly formed bone matrix is defectively mineralized leading to signs and symptoms of the disease.<sup>8</sup> Nutritional rickets is a disorder of growing children. Patients with rickets may present with the clinical signs of bowed legs, rickety rosary, frontal bossing of the skull, widened wrist and ankle joints, poor growth, delayed motor development, recurrent lower respiratory infections, chronic diarrhea and fits. Metaphyseal flaring, irregularity and widening of metaphysis are the main radiological findings in rickets.<sup>9</sup>

In spite of good sunshine in swat valley, cases of Rickets do come to clinical practice with different presentation. As winter sunlight is ineffective at stimulating cutaneous synthesis of vitamin D; the season is an additional consideration.<sup>10</sup>

## MATERIAL AND METHODS

This study was conducted in the Department of Child Health Saidu Teaching Hospital Saidu Sharif Swat over one year period from December 2009 to December 2010. This was the period in swat , when terrorist activities were going on here, and people used to keep their children inside home,

leading to poor sun exposure and poor weaning facilities. All infants and children presenting with signs and symptoms of rickets were included in the study. Detail history of sun exposure, weaning, housing and repeated respiratory illness, chronic diarrhea and delayed motor mile stones were taken and filled in preformed proforma. All those children with signs and symptoms of rickets and having any liver disease, kidney disease or on any anticonvulsants were excluded from the study. Initial investigations include serum alkaline

phosphates, serum calcium, serum phosphate and X-ray right wrist joint AP view. Other investigations like liver function tests (LFTs) and renal function tests were done in selected patients.

## RESULTS

In this study total of fifty patients were included. Males were 35(70%) and 15(30%) were females patients. As shown in chart I, all of them were divided into four groups according to age. Children below one year of age were 24(48%), be-

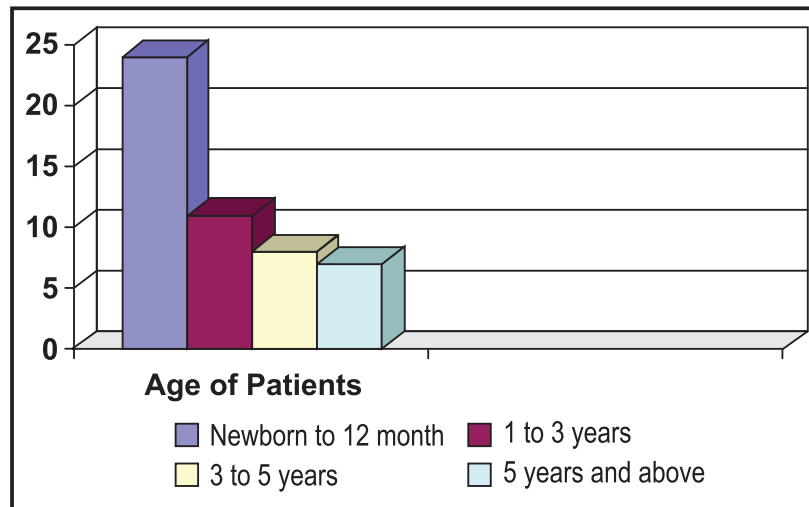


Fig. 1: Age distribution.

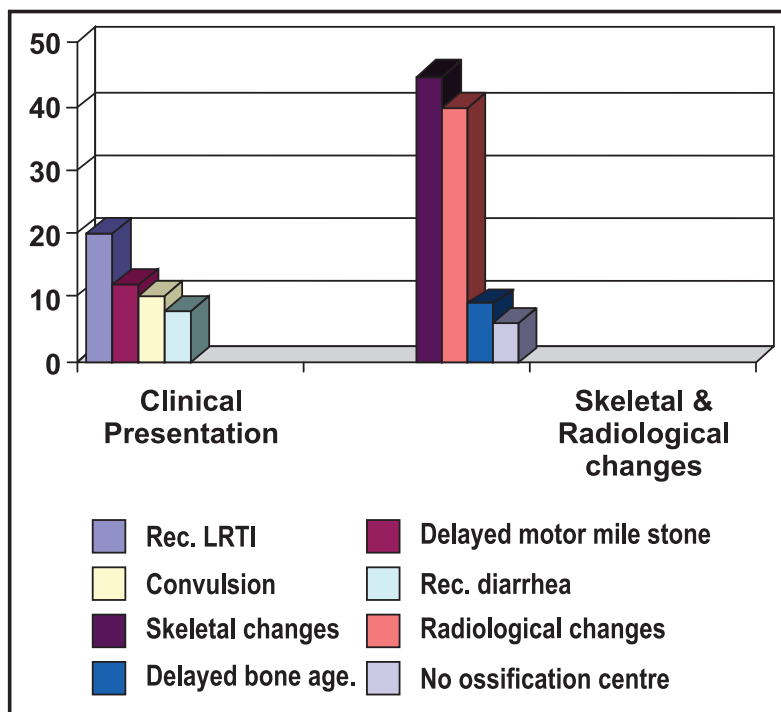


Fig. 2: Clinical and radiological changes

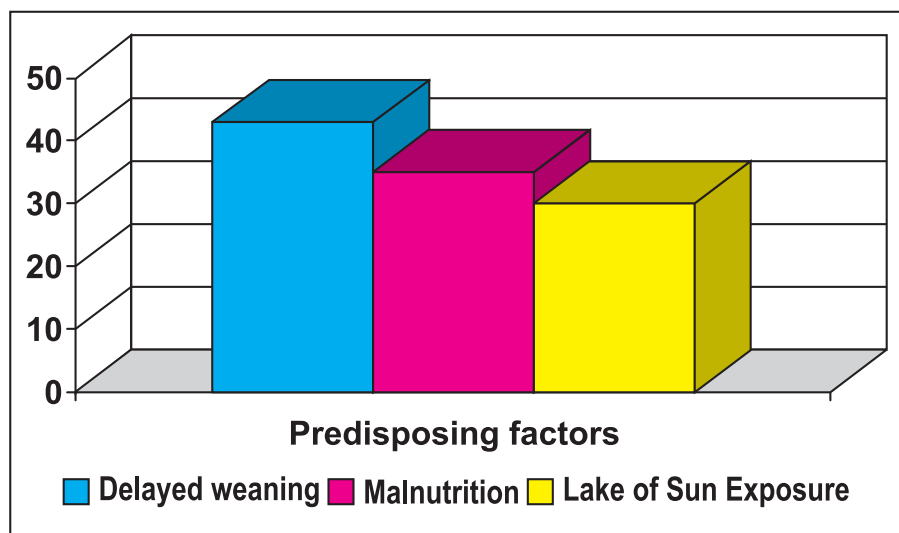


Fig. 3: Predisposing factors

tween one and three years were 11 (22%), between three and five years were 8 (16%) and above five years were 7 (14%) cases. Twenty (40%) children presented with recurrent lower respiratory tract infections, 12 (24%) children with delayed in motor mile stones, presentation with convulsions were in 10 (20%) children and recurrent diarrhea in 8 (16%) children was the main clinical presentation. On clinical examination skeletal changes were present in 45 (90%) children. Radiological signs of rickets were present in 40 (80%) children. X-ray wrist showed delayed bone age in 9 (18%) cases and in 6 (12%) infants more than six months old no ossification centers could be found.

Clinical and radiological presentation has been shown in chart II.

In 43 (86%) children weaning was either not started, delayed, or inadequate. Malnutrition was present in 35 (70%) children. Lack of sun exposure due to poor sun at home or keeping the children inside home due to terrorist activities was identified as predisposing factor in 30 (60%) cases. Predisposing factors have been shown in chart III.

## DISCUSSION

Rickets is common in Pakistan like other developing countries as reported by different authors.<sup>11</sup> In our study 70% patients were males and 30 % were female that is probably due to the male dominance nature of our society where males are brought to the health facilities early.

In our study the most common presentation (40%) of rickets was with lower respiratory

tract infections, similar high co-incidence has been reported by other national and international authors.<sup>11,12</sup> Yener et al have reported more episodes of bacterial infections in children with vitamin D deficiency as compared to healthy children.<sup>13</sup>

Second commonest presentation in our study was delayed in motor mile stones, due to defective skeletal maturation and muscles weakness. One of the national studies has reported this to be the most common presentation.<sup>12</sup>

Twenty percent of children, all below six months of age, in our study were received in generalized tonic clonic fits or with multi-focal twitches. As hypocalcaemia is more common in initial stages of nutritional rickets,<sup>14</sup> especially during rapid growth period. Similar incidence has been reported by Hameed et al.<sup>15</sup>

Recurrent diarrhea is a common problem in our setup as in other developing countries, but we found sixteen percent children of recurrent diarrhea linked with rickets, who responded to vitamin D supplementation. Three local studies have also reported similar results.<sup>11,12,15</sup>

In our study 90% of children showed the clinical signs of the rickets, 80% children had radiological findings of rickets, 18% showed delayed bone age and 12% children above six months age had no ossification centre at all. Similar results have been shown by other authors as well.<sup>12,13,15</sup> Hameed et al have reported clinical signs in 70% of the children with nutritional rickets.<sup>15</sup> Gerup H et al in his study on Vitamin D deficiency among immigrant children in Denmark reported similar incidence of delayed in bone age.<sup>16</sup>

Out of predisposing factors, delayed or inadequate weaning was the most common (86%) factor, may due to ignorance, poverty, food taboos or lack of food due to terrorist activities in our villages. The same is reflected in the high incidence of malnutrition (70%) in our study. A study conducted in slum areas of Karachi by Jamal A et al reported 99% of the children with nutritional rickets to have malnutrition.<sup>17</sup>

## CONCLUSION

In spite of good sun shine in swat valley, rickets is a common but an unrecognized problem that leads to a lot of life threatening complications like bacterial pneumonias and delay in motor mile stones. If kept in mind, clinically it can be easily diagnosed. The investigations are less expensive and if found and treated early, many complications can be prevented easily.

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