

# Severe acute malnutrition and rickets: A diagnostic dilemma

Sir,

Protein–energy malnutrition (PEM) is still much of a public concern in Nigeria and other developing countries, and it accounts for about 50%–60% of under-five mortality in developing countries.<sup>[1,2]</sup> It is often described as the silent emergency.<sup>[3]</sup> However, growth failure in PEM affects all tissues including the bones. Therefore, this impairs bone mineralization; hence, diseases such as rickets are unusual in them. While there have been reports of rickets in children with PEM,<sup>[4]</sup> most of them are moderately malnourished.<sup>[5]</sup> Therefore, the case of a severely malnourished child with rickets is highlighted in this communication.

The index case was a 2-year-old child with fever, difficulty in breathing with bilateral chest crepitations. However, there was a history of inability to crawl or stand with loss of neck control for a year. He also had bilateral ear discharge. He was delivered at term, and early infancy was not remarkably eventful. His weight for age was 51.5% of normal; the mid-arm circumference was <12 cm. He had a box-like-shaped head, and the anterior fontanel was still patent measuring 2 cm × 2 cm with diathesis of the metopic suture. There was presence of Harrison's sulcus but absence of swollen wrist [Figure 1]. The alkaline phosphatase was essentially normal, while the serum calcium and phosphate were reduced. Based on these, the diagnosis of severe PEM (marasmus), bronchopneumonia (BPN), chronic suppurative otitis media (CSOM), and rickets were made. He had calcium, Vitamin D replacement, treatment for BPN and CSOM with antibiotics, and nutritional rehabilitation. He made remarkable improvement as he could then sit unsupported with regaining of neck control before discharge. The exact mechanism of rickets in PEM is not completely understood. Lulseged,<sup>[6]</sup> Shimeles and Lulseged<sup>[7]</sup> in their study among Ethiopian children reported significant occurrence of rickets in children with PEM. However, growth may not be completely restricted in those with mild-to-moderate malnutrition allowing for disorders of mineralization such as rickets to set in; but in severe malnutrition as the index case, the association is unusual. The possible explanation is rickets may have preceded the malnutrition and the parents only seek medical attention following the chest infection and malnutrition.



**Figure 1:** Subtle features of rickets in a malnourished child

Diagnosing rickets in patients with PEM may be challenging because the signs maybe subtle; however, the index case had florid physical signs at presentation such as caput quadratum, Harrison's sulcus, and patent anterior fontanel. However, the normal alkaline phosphatase in this scenario is not unusual because of the severe malnutrition.<sup>[8]</sup>

#### Financial support and sponsorship

Nil.

#### Conflicts of interest

There are no conflicts of interest.

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<b>Quick Response Code:</b>	<b>Website:</b> <a href="http://www.sudanmedicalmonitor.org">www.sudanmedicalmonitor.org</a>
	<b>DOI:</b> 10.4103/summ.summ_9_17

<b>How to cite this article:</b> Ibrahim ZF, Aliyu I. Severe acute malnutrition and rickets: A diagnostic dilemma. <i>Sudan Med Monit</i> 2017;12:31-2. © 2017 Sudan Medical Monitor   Published by Wolters Kluwer - Medknow
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