Dear Sir,

Rickets evolved from vitamin D deficiency seldom occurs in our environment. However, we have recently diagnosed 2 new cases of this disease, in stages II and III according to the classification of Fraser et al. [1]. The patients, a sister and a brother, were brought up with insufficient sunlight and feeding. Their main analytic data are listed in table 1.

Burgess and Osman [2] found metabolic acidosis in infants suffering from vitamin-D deficiency rickets. Renal tubular dysfunction was associated with the vitamin-D deficiency rickets much later, though. The dysfunction is characterized by one or more of the following anomalies; generalized aminoaciduria [1,3]; glycosuria [4]; renal acidosis [2, 5-8], and urinary loss of magnesium [9, 10]. The cause of the renal tubular dysfunction is commonly related to the secondary hyperparathyroidism, as well as to a phosphate deficit [11, 12]. Although the role of urinary N-acetylglucosaminidase (NAG) as a tubular damage marker is known, we have not found any determinations of this parameter in cases of vitamin-D deficiency rickets in the literature. Indeed, we found high NAG values in our patients (table 1). For comparison, the regular NAG values at our hospital are 7.2 ± 5.2 U/g for infants younger than 2 years, and 4.4 ± 2.7 for children from 2 to 6 years old [13]. These high values normalized after treatment with vitamin D. As the only anomaly associated with tubular dysfunction, the patient in stage III showed hyper-chloremic metabolic acidosis. The patient in stage II had none of the anomalies referred to above.

In summary, a high urinary NAG value seems to be an additional anomaly associated with the renal tubular dysfunction of vitamin-D deficiency rickets. It has the advantage of being a very early marker of tubular damage induced by this disease.

Case I Case II
male female 23 45
8.7 9.2
2.7 3.9
110 105
7,210 1,897
6 5
98 91
Table 1. Analytic data of the 2 patients

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age, months</th>
<th>Serum calcium, mg/dl</th>
<th>Serum phosphate, mg/dl</th>
<th>Serum chloride, mEq/l</th>
<th>Alkaline phosphatase, IU/l</th>
<th>Calcidiol, ng/ml</th>
<th>Calcitriol, pg/ml</th>
<th>Intact PTH, pg/ml</th>
<th>Serum bicarbonate, mEq/l</th>
<th>Urine NAG/creatinine, U/g</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>155</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14.5</td>
<td>49.1</td>
</tr>
</tbody>
</table>

References


Martinez Ortega M, Elcarte Lopez R, Sanz Osés MJ, Garcia Ibero C, Nadal Lizabe I: Glu-


