THE EVOLUTION OF BONE DISEASE IN PATIENTS ON RDT FOR 10 YEARS OR MORE

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Material

Six patients were followed on Regular Dialysis Treatment (RDT) for ten years or more (Table I). Two of these already belonged in 1975 to the group of four in Europe who had been on RDT for the greatest number of years (Proceedings of EDTA, 1976). All patients are still working part time or more.

Methods

Since the start of the first patients in 1964 there has been a remarkable development in dialysis technique. From 1964-1968 the patients were treated with the Alwall cylinder dialyser model 1952 with a priming volume of 1200 ml. From 1969 different models of disposable parallel flow Alwall-Gambro and Gambro-Lundia dialysers were used.

TABLE I. Some Characteristics in 6 Patients on RDT, followed ≥ 10 years

<table>
<thead>
<tr>
<th>Patient</th>
<th>Sex</th>
<th>Diagnosis</th>
<th>Age at start on RDT</th>
<th>Start on RDT</th>
<th>Special treatment</th>
<th>Operations</th>
<th>(\Delta)Densitometry</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. IP-O</td>
<td>Woman</td>
<td>GLN</td>
<td>20</td>
<td>1964</td>
<td>(1/1) OHD(_3)</td>
<td>Total PTX</td>
<td>-2.3</td>
</tr>
<tr>
<td>2. SP-J</td>
<td>Woman</td>
<td>GLN</td>
<td>22</td>
<td>1964</td>
<td>(1/1) OHD(_3)</td>
<td>Total PTX</td>
<td>-4.2</td>
</tr>
<tr>
<td>3. EG</td>
<td>Man</td>
<td>Polycyst.</td>
<td>59</td>
<td>1968</td>
<td></td>
<td>(\pm)0</td>
<td></td>
</tr>
<tr>
<td>4. SIA</td>
<td>Man</td>
<td>GLN</td>
<td>27</td>
<td>1968</td>
<td>(1/1) OHD(_3)</td>
<td>Total PTX</td>
<td>Bilat. (\Delta)NX</td>
</tr>
<tr>
<td>5. BP</td>
<td>Woman</td>
<td>Pyelon.</td>
<td>15</td>
<td>1968</td>
<td>(1/1) OHD(_3)</td>
<td>Subtotal PTX</td>
<td>Bilat. NX</td>
</tr>
<tr>
<td>6. ML</td>
<td>Woman</td>
<td>Pyelon.</td>
<td>13</td>
<td>1968</td>
<td>(1/1) OHD(_3)</td>
<td>Total PTX</td>
<td>Bilat. NX</td>
</tr>
</tbody>
</table>

\(1\) Parathyroidectomy  \(2\) Nephrectomy  \(\Delta\) Number of standard deviations (SD) from normal, last measurement.
Figure 1. Development in the point sum of radiological changes in six patients on RDT, followed for ≥ 10 years.
The calcium content in the dialysis fluid was variable until 1968, 3.0 from 1968 and 3.5 mEq/l from 1972. The s-calcium phosphate product (mg%) was kept between 40 and 70.

X-ray studies were done regularly since the start of RDT. During the years 1968-1973 x-rays were taken every fourth month of: hands, shoulders, lumbar spine, pelvis, hips, lower legs and feet. During other periods mostly the hands only were examined. All the films were evaluated by two of us. The findings were categorised into general and cystic decalcification, soft tissue calcification, small vessel calcification, subperiosteal and ungual tuft resorptions. All findings were graded from 0 to 3. Cortical thickness was measured on the middle of both metacarpale II and expressed in per cent of the total bone width.

The mineral content in the midshafts of both forearms was evaluated with a photon absorption technique using $^{241}$Am as the radiation source.

Bone biopsies were taken from the iliac crest and non-decalcified specimens were examined for bone volume, degree of mineralisation and osteoclastic activity.

Results

The mineral content in the forearms measured with densitometry was very low in most patients but showed no significant change during 1972-1978 (Table I). The radiological findings showed a continuous progression in all but one patient (ML—Figure 1). Signs of hyperparathyroidism appeared in five patients and in one as late as after five years on RDT. Cortical thickness decreased in all but one patient (ML).

Biopsy showed osteomalacia in most patients and intense osteoclastic activity in all.

Conclusion

The evolution of bone disease in patients on RDT is slow and may appear after many years of seemingly adequate dialysis. In only one patient was there an improvement, in all the others a steady progression.