CORRELATION OF VITAMIN D DEFICIENCY IN THE ELDERLY: A COMPARATIVE STUDY OF VITAMIN D2 AND VITAMIN D3

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Vitamin D deficiency is common in elderly subjects particularly when they are institutionalized in long stay geriatric wards. Vitamin D deficiency expose these patients in osteomalacia and secondary hyperparathyroidism which is a risk factor for increased cortical bone loss and hip fractures. The aim of this study was to compare the efficiency of vitamin D2 and vitamin D3 in the correction of vitamin D deficiency in elderly subjects, since it had been showed in animal studies1 and in some clinical situations - (epileptics, young premenopausal women2 that vitamin D3 was preferred to vitamin D2 for the 25 hepatic hydroxylation.

24 institutionalized elderly subjects (mean age ± DS: 86 ± 6 years) were enrolled in a randomized double blind study and received 1200 IU/day of either vitamin D2 or vitamin D3 given orally for 4 months. Serum levels of total 25 hydroxyvitamin D (25 OH D), 25 hydroxyvitamin D3 (25 OH D3) and 25 hydroxyvitamin D2 (25 OH D2) were measured monthly by a radiocompetitive assay using the rat serum D binding protein after chromatographic extraction3. Routine biochemistry and measurements of circulating intact parathormone (PTH) levels were performed at the same time.
25 OH D levels were initially very low and not different in the two groups (3.3 ± 2.6 ng/ml for the D2 treated group vs 2.4 ± 1.6 for the D3 group, normal: 10 - 30). 25 OH D levels increased in the two groups but significantly higher values were obtained after vitamin D3 administration (Table 1).

The increase in serum 25 OH D was entirely explained by an increase in serum 25 OH D3 levels in the D3 treated group and by an increase in serum 25 OH D2 levels in the D2 treated group. A significantly higher proportion of patients had 25 OH D above 15 ng/ml (a value considered to reflect adequate vitamin D repletion) after treatment with vitamin D3. Alkaline phosphatases and PTH levels decreased significantly during vitamin D treatment (- 20% and - 40% from initial values, respectively). PTH levels were inversely correlated with 25 OH D levels (r = 0.29, P < 0.01) when all values were taken into account.

This study confirms the extreme frequency of vitamin D deficiency in elderly institutionalized subjects and shows that equal doses of vitamin D3 and vitamin D2 given orally are not equivalent, since vitamin D3 leads to significantly higher circulating levels of 25 OH D than vitamin D2.

### Table 1
Effect of oral administration of vitamin D2 and vitamin D3 on serum levels of 25 OH D

<table>
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<th>Time (month)</th>
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<th>2</th>
<th>3</th>
<th>4</th>
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<td>D2</td>
<td>3.3±2.6</td>
<td>9.7±2.4</td>
<td>10.8±2.4</td>
<td>10.6±3.3</td>
<td>13.0±6.0</td>
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<tr>
<td>D3</td>
<td>2.4±1.6</td>
<td>10.9±3.8</td>
<td>15.1±3.2</td>
<td>16.2±5.0</td>
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<td>Difference (p)</td>
<td>NS</td>
<td>NS</td>
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REFERENCES