Serum Biotin Levels in Patients Undergoing Chronic Hemodialysis

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Dear Sir,

A number of clinical problems have recently been related to biotin deficiency, and this has rekindled the interest in the role of this vitamin in nutrition and its place in biochemistry [1,2]. Since the levels of biotin in biological fluids is an important tool for clinical investigation, we developed a biotin-avidin-double-antibody radioli-gand method freed from the problems of existing assays [3–5]. Details of the method will be reported elsewhere. The main improvements are the ability for easy simultaneous handling of more than 100 samples in less than 4 h and excellent assay characteristics with sensitivity less than 10 pg/ml.

We used this assay to measure biotin serum levels in 88 patients undergoing hemodialysis treatment for at least 3 years, since an earlier report [6] suggested biotin treatment in these patients due to an acquired biotin deficiency status. It was found (fig. 1) that the serum biotin levels were in the range of 0.5–2.4 ng/ml (the value of one sample was 3.0 ng/ml) while those in 51 serum samples, obtained from apparently healthy men and women, measured under the same conditions, were in the range of 0.1–0.8 ng/ml (the value of one sample was 0.9 ng/ml). Thus, the concentration of biotin in 75 serum samples (85%) of patients undergoing hemodialysis treatment was found to be higher than the upper limits of the normal range of the assay, whereas 13 serum samples (15%) were in the higher levels of the normal range.

The same patients also showed significantly higher concentrations, above the normal range, for endogenous small molecules such as urea, creatinine, uric acid, which did not interfere with the accuracy of the assay. Fifteen

patients under biotin treatment (10 mg/day for several months) had serum biotin values between 12.7 and 108.9 ng/ml.

We have no explanation yet for the high biotin values determined in patients undergoing maintenance hemodi-

0 0.5 1.0 1.5 2.0 2.5 3.0
Serum biotin, ng/ml

Fig. 1. Serum biotin levels determined in 51 healthy persons (–)

and 88 patients undergoing hemodialysis treatment (1). Note the higher levels in patients under hemodialysis treatment versus those in healthy individuals.

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alysis. Studies are in progress to elucidate any potential interference of biotin-like substance(s) or biologically inactive biotin derivative(s).

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