Evidence for a Cutoff Value of Desferrioxamine Infusion Test for Bone Aluminium Deposits in Hemodialyzed Patients

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Dear Sir,

We were very interested to read the article by Berland et al. published in Nephron 40:433–435 (1985).

Although the desferrioxamine infusion test (DFO test) has been proposed in detecting hemodialyzed patients with aluminium (Al) related osteodystrophy [3], the cutoff problem has however not been dealt with fully.

Moreover DFO test has been suggested in some cases as detecting Al-related osteodystrophy [3], in others as predicting Al tissue overload [4]. Yet, Al-related osteodystrophy and Al overload may not be the same thing [1]. Malluche et al. [2], using a similar DFO test, does not find it reliable in identifying patients with Al bone accumulation.

In Berland's article the results given may only lead to the conclusion that patients with 'Al deposits mainly located at the interface between osteoid tissue and mineralized bone' (Al +) behave on average differently from patients without the Al deposits (Al -), when submitted to a test with a 6-gram DFO dose.

Using the receiver-operating characteristic (ROC) curve [5], which describes test performance as the relation between the true-positive rate (TPR) and the false-positive rate (FPR) (fig. 1) on the data furnished by Berland, we found that, while change in serum Al ($\Delta sAl(t3) - sAl(t0)$ over 7 $\mu\text{mol/l}$) detects Al + patients with a sensitivity of 85.7% and a specificity of 100%, serum Al basal values greater than 3 $\mu\text{mol/l}$ detect Al + patients with a lower sensitivity, i.e. 42.8%, but the same specificity, i.e. 100% (fig. 1).

We may thus support the authors' conclusion with stronger evidence, demonstrating that DFO test is much

< 2 $\mu\text{mol/l}$

Fig. 1. ROC curve for Berland's results. $\circ = \Delta sAl$; $\blacktriangle = sAl$.

more sensitive but no more specific than serum Al basal values in detecting subjects with 'Al deposits located at the interface between osteoid tissue and mineralized bone'.

We stress moreover the usefulness of the ROC curve analysis in identifying appropriate cutoff values of tests. In this particular case we were able to quantify, by choosing the cutoff point among all the observed values, how much more reliable the DFO test is than sAl basal value in diagnosing the histologic picture.

The reliability of the cutoff value would be further enhanced using the ROC curve approach on a larger sample.

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