Anaemia of Chronic Renal Failure. Polyamines Are Not Raised in Uraemic Serum

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Dear Sir,

We were interested to read the paper by Freedman et al. [1983] on inhibition of erythropoiesis by uraemic serum. It has been suggested that spermine could be such an inhibitor [Radtke et al., 1981]. Crucial to this hypothesis is the demonstration of raised serum levels of polyamines in uraemia. Campbell et al. [1978] claimed that spermine and spermidine levels were increased up to six times normal in sera from patients on regular haemodialysis. We recently examined sera from 9 uraemic patients for polyamine concentration using high-performance liquid chromatography [Spragg and Hutchings, 1983].

The results are shown in table I. We also give the haemoglobin and creatinine concentrations for the same patients taken on the same day. All these patients were anaemic, severely uraemic, and were just about to start long-term dialysis. It can be seen that only putrescine levels are at all raised and these to only twice normal.

The values quoted by Campbell et al. [1978] were obtained by a radioimmunoassay method which was not specific, since the anti-spermine antibody had a 22% cross-reactivity with spermidine. The method used in the present study is specific for each polyamine, and recovery of added polyamines was 99% for putrescine and spermidine and 104% for spermine. The intra-assay variation (CV%) for plasma putrescine, spermidine, and spermine in normal plasma was 15, 13, and 14% respectively (n = 20) [Spragg and Hutchings, in preparation].

It may well be that spermine is a potent inhibitor of erythroid colony formation in vitro [Radtke et al., 1981] but our results strongly suggest that it is unlikely to be of clinical significance in the anaemia of chronic renal failure. This is in accord with the work of Freedman et al. [1983] who reported that the inhibitory capacity of uraemic serum was confined to high molecular weight fractions.

Table I. Results of haemoglobin, creatinine and serum polyamine levels in 9 uraemic patients

Patient No.

Hb.

g/dl

Creatinine $\mu\text{mol/l}$

Putrescine pmol/l

Spermidine pmol/l

Spermine pmol/l

7.3

7.3

6.9

8.6

6.3

9.0

5.9

6.2

8.2 Mean $\pm$ SD

Normal range (n = 19)

Assuming values of less than 70 were 69.

66

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