CAPD, Protective against Developing Dialysis-Associated Amyloid?

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Dear Sir,

Recent reports suggest that raised levels of β_2 -micro-globulin (β_2 M) in long-term haemodialysis patients lead to the deposition of dialysis-associated amyloid (DAA) [1]. Amyloid derived from this precursor molecule is of importance because of its implication in the development of dialysis arthropathy, recurrent carpal tunnel syndrome and bone amyloidosis [2, 3]. However, the question as to whether patients on continuous ambulatory peritoneal dialysis (CAPD) have an equal predisposition to developing DAA remains unanswered. Although there have been reports which suggest that elevated levels of β_2 M in CAPD patients may predispose them to developing DAA [4], histological confirmation of this has not yet been published. In this letter we present results which suggest that CAPD may be protective against this form of amyloidosis.

Between March 1986 and January 1987, 6 patients on maintenance haemodialysis using cuprophane membranes have changed to CAPD because of problems with vascular access. Their mean length of time on haemodialysis was 6 years (range 1.5–13). Samples for β_2 M were taken whilst they were on haemodialysis and then after they had been established on CAPD for a mean of 3 months. Samples were taken before dialysis whilst patients were undergoing haemodialysis. Laboratory measurement was with the Pharmacia β_2 M radioimmunoassay kit.

There was a significant difference in β_2 M concentration between the two treatment modalities ($p < 0.02$, paired t test) and all 6 patients demonstrated a lowering in the concentration of β_2 M. The mean ($\pm$ SD) β_2 M level in the patients whilst on haemodialysis was 59.4 ± 17.2 mg/l, and after changing to CAPD, 35.5 ± 4.5 mg/l (normal range 1–3 mg/l).

These results demonstrate a significant lowering in β_2 M concentration during treatment with CAPD in patients who have previously been on maintenance haemodialysis. This suggests that CAPD is less likely to result in elevation of serum β_2 M levels. It has been shown that the in vitro formation of amyloid fibrils from intact β_2 M is dependent upon increasing the concentration of β_2 M [5]. If a comparable process can occur in vivo then amyloidogenesis in dialysis patients would be dependent upon exceeding a threshold concentration of β_2 M. Should this be the case then CAPD patients would be less likely to develop DAA. This assertion is supported by the fact that there have been no reports in the literature of the development of DAA in CAPD patients [6].

2 of these 6 patients also had dialysis arthropathy at rheumatological assessment. On conversion to CAPD they both showed a significant improvement in severity of pain and range of movement of affected joints. The possible relationship between a fall in β_2 M level and relief of shoulder

pain has been previously reported after changing dialyser membrane from cuprophane to polysulfone [7]. In this report we demonstrate a similar relationship between clinical improvement and the lowering of β_2 M levels after changing to CAPD. However, other factors such as the bio-incompatibility-related inflammatory reactions which occur with cuprophane membranes [8, 9] but not with CAPD need to be taken into account.

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