S Protein (Vitronectin) in Hemodialysis Patients

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Dear Sir,
Hemodialysis (HD) patients are constantly affected by complement activation, because the dialysis membrane activates the alternative pathway of the complement sequence [1]. Consequently, the late component of complement is activated, and S protein (control protein of the C5b6789 complex) is thought to become affected and consumed [2]. Upon such a presumption, we determined the concentration of S protein in the serum obtained from 186 chronic renal failure (CRF) patients with HD, 15 CRF patients without hemodialysis (non-HD) and 40 healthy humans.

The concentrations of S protein of HD patients were lowered with the values of S protein showing a significant correlation with the history of dialysis ($r = 0.26$; $p < 0.01$; fig. 1). The average (mean $\pm$ SD) of S protein in HD patients showed a value of $67.6 \pm 14.6\%$ which was significantly lower than the normal value of healthy humans which was $101.9 \pm 19.2\%$ ($p < 0.01$). Similarly, the average value for non-HD patients, $88.7 \pm 14.4\%$, was also significantly lower than that of healthy humans ($p < 0.05$). The following factors may contribute to the lowering of S protein concentration: firstly, it may be due to complement activation induced by regular HD; secondly, it has become clear that S protein is denaturated by urea N and guanidine and then binds with other substances such as heparin 3, 4. As chronic toxins such as urea N and guanidine increase under renal failure conditions, S protein is thought to be denaturated and affected by substances like heparin. Furthermore, the heparin used during HD may also contribute to the lowering of S protein concentration.

Hence, the marked lowering of S protein may be due to several mechanisms such as those mentioned above. We observe the lowering of S protein concentration dur-

Fig. 1. In the relation between S protein levels and the HD history of 186 HD patients, S protein levels became lower as HD history increased ($r = 0.26$; $p < 0.01$). The dotted band is the normal range (mean + SD).

ing the condition of low complement levels in acute poststreptococcal glomerulonephritis.

However, it is often observed that the S protein concentrations of HD patients are found to be even lower than that of acute glomerulonephritis.

It has been suggested that S protein is an important protein for cellular functions. In addition, for HD patients, the impairment of immunological functions, the frequent and simultaneous occurrence of cancer and an easily infectious state have also been reported. Upon observing all these phenomena, it is thought possible that in HD patients, the lowering of S protein of which its function has not been elucidated may have an important effect on the patients.

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