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EFFECTS OF RENAL FAILURE ON SERUM TRANSAMINASE ACTIVITY*

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It is known that serum transaminases increase during myocardiac infarction and hepatitis, and in fact transaminases are important in diagnosing hepatitis. Epidemics of the latter disease are frequent among patients on chronic intermittent hemodialysis programs[1,2]. However, various researchers have reported a drop in transaminase values during renal failure[3,4], and some have affirmed the drop to be more apparent in patients undergoing hemodialysis[5]. The present study was therefore undertaken to examine the serum transaminase activity of patients on chronic intermittent hemodialysis with a view towards accurately diagnosing hepatitis.

Material and Methods

This research covered 47 patients with chronic renal failure being treated at the Hacettepe University Faculty of Medicine Hemodialysis Unit between 1975 and 1978. Dialysis was performed on the UFII coil-Travenol artificial kidney for 6 hours twice a week. An adequate amount of blood was taken from all the patients before and after the dialysis and the BUN (blood urea nitrogen), creatinine, SGOT (serum glutamic oxaloacetic transaminase) and alkalene phosphatase[6] levels were determined.

The SGOT and SGPT (serum glutamic pyruvic transaminase) were examined with the Reitman-Frankel[7] method and normal findings were 8-40 KU (Karmen units) and 5-35 KU, respectively.

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Findings

At the end of hemodialysis, the BUN and creatinine levels generally dropped whereas the SGOT, SGPT and alkalene phosphatase levels increased. Table I illustrates the means of the findings, standard errors and the statistical comparisons.

TABLE I

MEAN, STANDARD ERROR AND STATISTICAL COMPARISON OF LABORATORY FINDINGS BEFORE (B.D.) AND AFTER (A.D.) DIALYSIS

		BUN mg/dl	Creatinine mg/dl	SGOT KU	SGPT KU	Alkalene phosphatase BU
Mean	B.D.	99.53	12.57	29.14	16.72	14.88
	A.D.	61.25	7.92	41.97	25.91	16.47
Standard errors	B.D.	5.05	0.81	1.89	1.80	1.03
	A.D.	3.37	0.63	3.54	3.39	1.28
p value		< 0.001	< 0.001	< 0.001	< 0.001	< 0.05

Discussion

As illustrated in the table, this study revealed that the serum transaminase levels of patients with uremia which were low before the dialysis increased after it. This conclusion coincides with that of Cohen et al[3] in the literature regarding transaminase values of patients with chronic renal failure.

Wolf et al[5] reported that the SGOT activity of 11 out of 19 patients undergoing hemodialysis dropped and attempted to link this with a deficiency of pyridoxine phosphate, a SGOT coenzyme. The same low activity in pregnant women was found by various researchers; once again pyridoxine, which decreases during pregnancy, was held responsible[8].

In our opinion it is incorrect to explain the low transaminase value in uremic patients undergoing chronic hemodialysis by pyridoxine deficiency.The fact that these patients are constantly ingesting vitamins containing pyridoxine makes a pyridoxine deficiency highly unlikely. Furthermore, since certain soluble vitamins — including pyridoxine which is a product of vitamin B_6 — are lost during hemodialysis[9,10], it is to be expected that the transaminase values at the end of hemodialysis would drop rather than increase.

According to another theory, it is the small-melocule-toxins which are responsible for the low activity since they are better purified by hemodialysis[11]. Another trend of thought is that the transaminases absorb the ultraviolet rays used in the readings, thereby creating a false drop. This view would seem unlikely, however, in the light of reports in the literature that measurements without ultraviolet also revealed a drop in transaminase activity[4].

In our opinion, it is more appropriate to attribute the low enzyme activity to the toxins accumulating in the sera of the patients, which directly inhibit enzyme activity. This view is supported by the fact that the alkalene phosphatase activity increases at the end of hemodialysis.

In conclusion, it can be claimed that an apparent inhibition occurs in the serum transaminase values of uremic patients. It is therefore recommended that when these patients are being diagnosed for hepatitis, transaminase values at the end of the dialysis be taken into consideration.

Summary

The serum transaminase values before and after dialysis of 47 patients undergoing chronic, intermittent treatment were studied. Reasons for the increase in serum transaminase values after dialysis were discussed and the importance of the subject emphasized.

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