

The Value of Paper Electrophoresis In Diagnosis of Nephrotic Syndrome

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INTRODUCTION

Alteration in serum protein level has been well observed by the various workers in Nephrotic Syndrome (N. S.). In present study Total Serum Protein (T. S. P.) and its different constituents estimation by Paper Electrophoresis (P. E.) has been undertaken to assess its role in diagnosis of N. S.

METHODS & MATERIAL

The clinical material included 50 cases of N. S. from medical ward of Darbhanga Medical College Hospital; Laherisarai. These cases were diagnosed on the basis of clinical as well as relevant Lab. Investigation. 25 normal individuals were also studied for control group. T. S. P. estimation was done by Biuret method (King & Wotton 1964) and P. E. was done by a systronics horizontal electrophoretic tank. Staining and washing of electrophoretogram was done by Fraglen technique (Varley 1969).

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OBSERVATION

TABLE—I

Showing mean value of T. S. P. and its components in Gm % in CONTROL group

No. of Cases	TSP	Serum Electrophoresis				
		Albumin	Globulin			
			Alpha-1	Alpha-2	Beta	Gamma
25	6.9 ± 0.05	4.13 ± 0.13	0.29 ± 0.05	0.43 ± 0.03	0.56 ± 0.07	1.27 ± 0.07

TABLE—II

Showing mean value of T. S. P. and its components in Gm % in N. S.

No. of Cases	TSP	Serum Electrophoresis				
		Albumin	Globulin			
			Alpha-1	Alpha-2	Beta	Gamma
50	4.6 ± 0.55	1.4 ± 0.36	0.26 ± 0.06	1.20 ± 0.23	0.81 ± 0.27	0.88 ± 0.02

DISCUSSION

In the present study T. S. P. and serum albumin in N. S. were found to be less than in control group. Pandey et al⁴ reported a low level of T. S. P. and serum albumin in N. S. They correlated it with urinary loss and suggested it as the main factor causing low T. S. P. Mac Kay et al² indicated that low T. S. P. could not be entirely explained by the urinary loss since a normal subject can synthesise approximately 50 Gms Of protein a day while nephrotic patients usually loose 10 to 20 Gms of protein a day. Lamba et al¹⁰ studied the serum albumin metabolism by double isotope technique using I ¹³¹ Hsa and Cr¹⁵ Hsa. He found a definite hypercatabolism of albumin in N. S. Jeejee Bhoy suggested that Enteric Loss i. e, migration of serum albumin from intravascular space to extra vascular space, is one of the contributing

factor in producing hypoalbuminaemia and thus hypoproteinaemia. Thus the most obvious explanation of low T. S. P. and serum albumin in N. S. is massive urinary loss of protein associated with hyper catabolism of serum albumin and enteric loss of protein as a contributing factor.

Serum alpha-1 globulin (A 1 G) value showed little change in N. S. Level of alpha-2 globulin (A 2 G) was found to be nearly 3 times higher than the control group. Kluthes et al found normal catabolic rate of A2G (a macro globulin) and suggested that kidney selectively retains the high molecular weight A2G, because A2G is virtually absent in the urine, in spite of high concentration in serum. But Eawatt et al⁸ suggested that this rise in A2G may be due to beta-lipoprotein of slightly altered composition which moves in a greater mobility and fuses with A2G fraction. Beta globulin level was appreciably high in N. S.

Value of gamma-globulin was less in N. S. than in control group in our study. Giltin et al found that there is increased catabolism of gamma-globulin in nephrotic patients and it may be the possible cause.

Bernstein et al⁶ studied the electrophoretic pattern of N. S. and post-streptococcal glomerulonephritis. By grouping A2g and gamma-globulin together he observed that in N. S. A2G was definitely high with low gamma-globulin value. On the other hand in post-streptococcal glomerulonephritis no change was seen in A2G while gamma-globulin was significantly high. Thus he found a high degree of discrimination between the two conditions.

Mackelvey et al⁷ and Dang et al⁹ stated that serum electrophoretic pattern in N. S. is highly diagnostic.

SUMMARY

Using P. E., T. S. P. and its various fractions were studied in 50 cases of N. S. and 25 cases of control. T. S. P., serum albumin and gamma-globulin level in N. S. were lower than control group. Level of alpha-2 and beta-globulin were significantly high while no change was seen in alpha-1 globulin. As above pattern of electrophoretogram is not seen in other diseases, this can be a valuable guide in the diagnosis of Nephrotic Syndrome.

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