

of the pernicious anemia patient, parenteral liver extract does not significantly change the fission rate of *Paramecium caudatum*. In the higher concentrations employed, liver extract decreased the fission rate. Inactivated liver extract decreased the fission rate in all concentrations used. Obviously the procedure has no value as a bioassay method for the antipernicious anemia principle.

### 10932

#### **Amino Acid Nitrogen in Urine of Children with the Nephrotic Syndrome Following Intravenous Amino Acids.**

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Recently Farr and MacFadyen<sup>1</sup> reported observations on the concentration of amino acids in the blood plasma of children with the nephrotic syndrome. They observed that while the disease persisted the concentrations were subnormal. Furthermore, nephrotic crises<sup>1, 2</sup> were ushered in with a sudden further fall in plasma amino acid concentration and clinical recovery from these crises was attended by a rapid rise to the precritical subnormal concentration. The close association of the clinical course of the disease with changes in the amino acid content of the blood plasma suggested the possibility of treating these patients, particularly during nephrotic crises, by giving amino acids intravenously. A prerequisite to this therapy was the determination of urinary loss of amino acid by *nephrotic* children following intravenous amino acid injections. The present study was designed to bear on this point.

Four children with the nephrotic syndrome on the wards of the hospital were chosen for study. Two were males, W. O'B. and J. C., 5 and 6 years of age respectively, and 2 were females, E. S. and R. Q., both 7 years of age. These children had all been studied extensively during the period of their hospitalization which varied from 7 to 14 months. At the time of the study all had characteristically low plasma proteins, normal hemoglobin, normal blood urea nitrogen, normal or elevated urea clearances, normal blood pressure and absence of hematuria. All were free from obvious acute or focal infection.

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<sup>1</sup> Farr, L. E., and MacFadyen, D. A., *Am. J. Dis. Child.*, in press.

<sup>2</sup> Farr, L. E., *Am. J. Dis. Child.*, in press.

*Methods of analysis.* Total urinary N.P.N. was estimated on trichloroacetic acid urine filtrates by the gasometric micro-Kjeldahl method of Van Slyke.<sup>3</sup> Urine urea plus ammonia nitrogen by the gasometric technic of Van Slyke and Kugel,<sup>4</sup> and urinary amino acid nitrogen by the ninhydrin method of MacFadyen and Van Slyke.<sup>5</sup>

*Procedures.* After an overnight fast a urine specimen was obtained from each patient to empty the bladder. Two hundred cc of water were then given and urine specimens were obtained until the total quantity was sufficient to obviate small errors of collection. Immediately after this specimen was obtained 5.0 g of casein hydrolysate (generously furnished by Mead Johnson and Co.) were given intravenously in a 10% solution. Again urine specimens were obtained over the intervals ranging from 65 to 166 minutes immediately following this intravenous medication. At this juncture the patients were fed their usual breakfast. Urine was then collected throughout periods varying from 73 to 116 minutes following the meal.

TABLE I.

Simultaneous Determinations of Urinary Excretion Rates of Total Non-Protein Nitrogen, Urea Nitrogen and Amino Acid Nitrogen, Before and After Intravenous Acids and a Protein Meal in Nephrotic Children.

Patient, Age in yrs	Sex	Condition of patient	Time of period in min	Urine vol., cc/min	Excretion per min		
					N.P.N. mg	Urea + NH <sub>3</sub> N mg	Amino N mg
J.C. 6	M	Fasting	147	1.67	3.98	3.28	.042
		Amino acid I.V.*	166	1.15	3.34	2.77	.057
		Breakfast <sup>1</sup>	116	0.95	3.19	2.77	.041
W.O'B. 5	M	Fasting	174	0.235	4.02	3.52	.034
		Amino acid I.V.*	162	0.327	4.68	3.81	.065
		Breakfast <sup>2</sup>	99	0.403	3.86	3.28	.011
E.S. 7	F	Fasting	192	0.304	4.65	4.16	.031
		Amino acid I.V.*	65	0.831	5.75	4.62	.073
		Breakfast <sup>3</sup>	73	0.452	5.38	4.41	.056
R.Q. 7	F	Fasting	200	0.325	4.98	4.35	.041
		Amino acid I.V.*	100	0.600	5.79	4.79	.071
		Breakfast <sup>4</sup>	83	1.096	5.30	4.62	.053

\* 5.0 g of casein hydrolysate (640 mg amino nitrogen).

<sup>1</sup> Protein 7 g, fat 15 g, carbohydrate 62 g.

<sup>2</sup> " 11 " " 20 " " 75 "

<sup>3</sup> " 20 " " 30 " " 62 "

<sup>4</sup> " 23 " " 33 " " 77 "

<sup>3</sup> Van Slyke, D. D., *J. Biol. Chem.*, 1927, **81**, 235.

<sup>4</sup> Van Slyke, D. D., and Kugel, V. H., *J. Biol. Chem.*, 1933, **102**, 489.

<sup>5</sup> MacFadyen, D. A., and Van Slyke, D. D., to be published.

*Results.* Table I shows the results obtained. In 3 of the 4 children the urinary excretion per minute of non-protein and urea nitrogen was slightly increased after the casein hydrolysate was given. In one child the values for these substances decreased. The excretion per minute of amino acid nitrogen increased slightly in each instance. Following the meal the loss of amino nitrogen was greater than the fasting level in 2 children, less in one and the same in one. In each child there was slightly less amino nitrogen in the urine after eating than after intravenous injection but the range was small.

Assuming that all the amino acid nitrogen secreted in the urine during the period immediately following intravenous injection was derived from the amino acid mixture given, the loss amounted to approximately 1%. Since normally there is some excretion of amino acids in the urine even under fasting conditions, it may be concluded that the loss of injected amino acids as such is insignificant. The absence of an increase in the excretion per minute of total non-protein nitrogen and urea plus ammonia nitrogen indicated that the amino acids given were not rapidly broken down to end-products of metabolism and excreted. This suggests that the nitrogen supplied by a casein hydrolysate given intravenously is available for nutritional needs. Further studies have already been carried out on this point and will be reported later.

*Summary.* There was no significant immediate increase in the urinary excretion per minute of non-protein nitrogen, urea plus ammonia nitrogen nor amino acid nitrogen, by 4 nephrotic children 5 to 7 years of age who had received intravenously 5 g of an amino acid mixture from casein hydrolyzed by enzymes. Therefore it appears probable that the injected amino acids are utilized for the nutritional needs of the patients.

### 10933 P

#### Effect of Pyocyanin on Cerebral Metabolism.\*

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Young<sup>1</sup> has demonstrated that pyocyanin evokes an initial stimulatory effect on the respiratory exchange of excised cerebral tissue,

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<sup>1</sup> Young, L., *J. Biol. Chem.*, 1937, **120**, 659.