

and 21.0 mg. respectively; and orally to one patient with myxedema in a dose of 10.5 mg. The patient who received 31.5 mg. intravenously showed a slight but fairly prolonged increase in basal metabolism of from -41% to -35% . If this slight increase may be considered definite, then this compound when administered intravenously in alkaline solution produces only about $1/16$ of the effect of thyroxine. When given subcutaneously in suspension, the effect was greater and amounted in one patient to about $1/4$ and in another to about $1/6$ of the effect of thyroxine given intravenously. These data suggest that the amino group is important for the calorigenic action of thyroxine.

By proteolytic digestion of desiccated thyroid according to the method of Harington and Salter,⁴ we have prepared a peptide of thyroxine containing 2.5% nitrogen and 48% iodine, with a nitrogen:iodine ratio of 0.48:1. This peptide was insoluble in distilled water but soluble in sodium hydroxide. When suspended in distilled water and administered by mouth to patients with myxedema, it produced only a slight increase in basal metabolism, which was about the same as that produced by the monosodium salt in doses containing the same amount of iodine. When administered by mouth in alkaline solution it produced $3\frac{1}{2}$ times as much effect as when given suspended in distilled water. In an alkaline solution its effect was about $4/5$ as great as that of thyroxine injected intravenously in an alkaline solution, and slightly greater than those of oral administration of desiccated thyroid and an alkaline solution of thyroxine in doses containing the same amount of iodine.

7412 P

Antistreptolysin Content of Blood Serum of Children. Its Significance in Rheumatic Fever.

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Todd^{1a} described a method of titrating antistreptolysin in blood serum by which a diagnosis of a preceding hemolytic streptococcus

⁴ Harington, C. R., and Salter, W. T., *Biochem. J.*, 1930, **24**, 456.

¹ (a) Todd, E. W., *J. Exp. Med.*, 1932, **55**, 267. (b) Todd, E. W., *Brit. J. Exp. Path.*, 1932, **13**, 248.

infection may be made. Coburn and Pauli² considered the antistreptolysin titre of 200 units or higher at the onset of rheumatic fever as immunologic evidence that the hemolytic streptococcus initiates the disease. Myers and Keefer,³ however, obtained an average of 200 units in normal subjects with a higher average (500 units) in rheumatic fever.

The majority of these observations were made in adults. They represent either single determinations or repeated tests over a short period and give a wide normal range of from 50 to 500 units.

In view of these findings it seemed of interest to obtain information as to the antistreptolysin titre in children of various ages, including: (1) Subjects apparently well; (2) Convalescents following streptococcus and miscellaneous infections; and (3) Rheumatic children during active and inactive periods.

Method. Todd's technic^{1b} was closely followed. A standard horse serum and patients' serums of known titre were used as controls in each series of tests.

Control series included 150 subjects from 3 months to 16 years of age; a group of 67 subjects in apparent health (no history of streptococcus infection); 51 convalescing from miscellaneous infections (varicella, pertussis, pneumonia); and 32 convalescing from hemolytic streptococcus infections (scarlet fever, erysipelas, respiratory infections). The rheumatic series included 133 subjects under weekly observation for from 9 to 12 months; 41 patients with active rheumatic fever (chorea, carditis, arthritis); and 92 subjects in the inactive stage.

Observations are summarized in Table I.

The observations on sixteen mothers and newborn infants (2 to 8 days of age) are of particular interest. In the majority of the tests the titre for mother and infant were the same; in the remaining the infants were consistently higher. Repeated determinations were made at 2, 3, and 4 weeks; the mothers' sera remained at the same level, while the infants' sera progressively diminished, approaching the average level secured for children 3 months to 3 years old. These observations would indicate placental transmission of this antibody.

An analysis of the average antistreptolysin titre for each age group in the normal series indicates a definite correlation with age, the lowest values being obtained in the 3 month to 3 year group.

A comparison of the average titres for normal subjects (200

² Coburn, A. F., and Pauli, R. H., *J. Exp. Med.*, 1932, **56**, 651.

³ Myers, Walter K., and Keefer, Chester S., *J. Clin. Invest.*, 1934, **13**, 155.

TABLE I.
Antistreptolysin Titre of Sera in Children.

Antistreptolysin	Mother	New-Born	Control Series						Rheumatic Series			
			Normals			Infections			Streptococcus		Active	Inactive
			1/4 to 3 yrs.	3-5 yrs.	6-16 yrs.	1/4 to 3 yrs.	3-16 yrs.	1/4-3 yrs.	3-16 yrs.	6-16 yrs.		
Total Subjects	16	16	11	8	48	34	17	22	10	41	92	
*Average Units	50	56	10	90	200	50	125	166	500	250	200	
“ “ N.D. cc.	.02	.02	0.1	.012	.005	.02	.008	.006	.002	.004	.005	
Above Average %	31	43	18	37	25	32	41	40	40	27	35	
Below “ “	50	31	0	62	69	68	47	56	40	54	53	
Range in Units	25-83	—10-100	—10-20	10-333	20-1000	10-200	10-350	10-500	10-1000	50-1600	33-1000	
Mode “ “	50	25-62	—10	50	166	144	144	333	500	200	200	

*The average titre for each group includes single representative determinations for each subject. A total of 679 determinations was made.

units) and rheumatic patients, active or inactive (250-200 units), of the same age group shows no significant difference. The average value in subjects with preceding streptococcus infections (500 units) was definitely higher.

The wide range of titres, from 20 to 1000 units, observed in both the control and rheumatic series indicates the importance of knowing the antistreptolysin level of each individual for a control period before attaching any significance to a single determination. High titres, 333 to 1000 units, were maintained over periods of from 5 to 9 months in normal and in rheumatic subjects who were apparently well. It is also of interest that higher values were obtained during the winter and spring months.

A significant rise in the antistreptolysin titre was frequently noted in rheumatic subjects, unaccompanied by rheumatic activity. Only 20% of the subjects who developed rheumatic fever during the period of observation exhibited a rise in titre above their level during the control period. The rise in titre was not directly related to type, severity or duration of the rheumatic activity.

The evidence presented in this study does not indicate that the antistreptolysin content of the serum of children with rheumatic fever is of specific etiologic significance.

7413 C

Quantitative Colorimetric Estimation of Morphine in Biological Fluids by the Iodoxybenzoate Method.*

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Development of a satisfactorily accurate quantitative application of the usual color reactions for morphine has been retarded because of their general lack of (a) proper selectivity for this single opium alkaloid, (b) permanence of hue produced or (c) sufficient sensitivity. In addition such reactions are in most instances dependent to an undesirable degree on the temperature and pH of the test solution and the presence of commonly occurring contaminants. This situa-

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