

Minnesota Section.

University of Minnesota, May 24, 1933.

6855

Study of Iodine Number of Serum Fatty Acids in Infantile Eczema.

ARILD E. HANSEN. (Introduced by Irvine McQuarrie.)

From the Department of Pediatrics, University of Minnesota.

The observation that marked skin changes develop in rats suffering from the unsaturated fatty acid deficiency disease described by Burr and Burr¹ suggested the possibility that certain dermatological disorders of childhood, such as infantile eczema, might be dependent in part at least upon this type of dietary deficiency. A few preliminary observations on eczematous babies given liberal supplements of unsaturated fatty acids in their diets in addition to the routine treatment were sufficiently encouraging to suggest the desirability of careful study of the blood lipids in this disease. In order to determine whether any relationship might exist between the two clinical entities, similar blood studies were undertaken on eczematous infants and on rats suffering from the unsaturated fatty acid deficiency.

The present paper deals exclusively with the results in the cases of infantile eczema. The total iodine absorption of the serum was first determined on one or more occasions in 10 cases of eczema and in 16 normal infants of similar age. This was followed by determinations of the total fatty acids, cholesterol, total iodine absorption of the serum and the iodine number of the serum fatty acids in 5 normal and 6 eczematous infants.

All blood samples were collected between 12 and 16 hours after a meal. Bloor's methods² were used to determine the cholesterol and total fatty acids in the serum. The Rosenmund-Kuhnhen³ method as modified by Page, Pasternak and Burt⁴ was used to determine the iodine absorption of the serum lipids.

¹ Burr, G. O., and Burr, M. M., *J. Biol. Chem.*, 1929, **82**, 345; 1930, **86**, 587.

² Bloor, W. R., *J. Biol. Chem.*, 1928, **77**, 53.

³ Rosenmund, K. W., and Kuhnhen, W., *Z. f. un^{ter}. d. Nahr. d. Nahr. u. Genuss.*, 1923, **46**, 154.

The preliminary data on the total iodine absorption values of the sera are as follows: The average for 21 determinations on 10 infants with eczema was 383 mg. (range 280-487) iodine absorbed per 100 cc. serum. The corresponding average for 18 determinations on the 16 control infants was 539 mg. (range 460-711).

The results from the more complete study of the blood lipids are shown in Table I.

TABLE I.
Serum lipids and iodine numbers of serum fatty acids in infantile eczema and in normal infants, age 5 to 18 mos.

I ₂ absorbed	Normal infants		Total lipids	I ₂ No.
	Cholesterol	Total fatty acids Mg. per 100 cc. serum		
514	213	361	574	104
477	160	339	499	109
711	232	411	643	136
508	150	407	557	101
386	142	292	434	100
540	213	354	567	113
Aver. 526	185	361	546	111
Children with infantile eczema				
404	143	443	586	69
416	118	317	435	104
362	142	328	470	82
417	159	340	499	91
370	150	345	495	78
307	148	261	409	80
416	160	360	520	86
Aver. 385	147	342	488	84

The serum cholesterol and total fatty acids are slightly less in the eczema cases than in the control infants. The average iodine number of the serum fatty acids in the eczema group is 84 while in the control group the average iodine number is 111. This indicates that the serum fatty acids are less unsaturated in infantile eczema than in the control infants. Hansen and Burr⁵ have shown that the serum fatty acids are less unsaturated in rats suffering from the unsaturated fatty acid deficiency disease. While this evidence does not preclude the possibility of a lipid-protein combination, if these data can be substantiated further, it appears that the unsaturated fatty acids must be given serious consideration as an etiological factor in infantile eczema. Further studies are now in progress to determine this point.

⁴ Page, H. H., Pasternak, L., and Burt, M. L., *Biochem. Z.*, 1930, **223**, 445.

⁵ Hansen, Arild E., and Burr, George O., *PROC. SOC. EXP. BIOL. AND MED.*, 1933, **30**, 1201.