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Complement Titer of Blood of the Newborn.

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During the course of studies on the complement content of human blood, we noted that the cord blood of the newborn infants consistently was of a lower titer than that of adults. We, therefore, determined simultaneously the complement titer of a series of newborn (cord) bloods and of the mother's blood taken at the time of delivery.

The titration was made according to the method outlined by Ecker, *et al.*¹ The serum was diluted 1 to 15 and a series of tubes set up starting with 0.01 cc of the diluted serum and increasing by

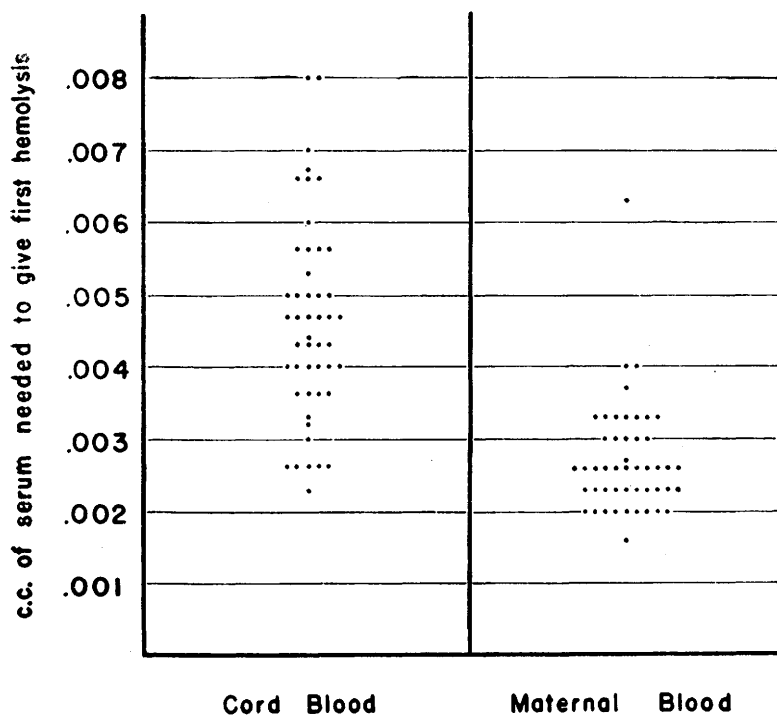


FIG. 1.

The comparative complement content in human newborn (cord) blood and maternal blood.

¹ Ecker, E. E., Pillemer, L., Wertheimer, D., and Gradis, H., *J. Immunology*, 1938, **34**, 19.

0.01 cc to reach 0.15 cc. The volume in all tubes was adjusted to 0.15 cc with saline and 1 cc of cells sensitized with 5 units of hemolysin was added. The tubes were incubated at 37°C for 30 minutes, centrifuged and examined for the point of first hemolysis which was taken as the end point. The volume of the undiluted serum necessary for this first hemolysis was considered as the index of the complement titer.

The comparative titers of the 48 samples are illustrated in Fig. 1. The cord blood titer varies considerably, ranging from 0.0023 to 0.0080, with a mean of 0.0046. The maternal bloods, which had in each case been drawn immediately after delivery, presented titers ranging from 0.0016 to 0.004 with but one exception which fell to 0.0063. The mean for the maternal blood was 0.0030.

Statistical analysis of the data reveals that a "reliability of difference" of 7 exists between the complement titer of maternal and newborn (cord) blood. This definitely indicates that a distinctly smaller amount of complement is present in the newborn than in the adult.

Of perhaps greater significance than the means is the fact that a comparison of the cord and maternal bloods of individual instances almost invariably reveals a higher complement titer in the maternal blood. In several instances, both bloods contained the same amount of complement, but in no instance did the cord blood show a higher value than that of the maternal blood.

This observation is essentially similar to that reached by Solling² and by Nattan-Larrier, *et al.*,³ who used, as a measure of the titer, the volume of serum necessary for complete hemolysis. Further work, using both animal and human sera, is in progress in an attempt to determine at what age and under which circumstances the serum in the newborn rises to the adult level, and also to determine the significance of the low complement titer of the newborn.

We wish to acknowledge the coöperation of Dr. H. L. Woodward, who permitted the use of his service at the Cincinnati General Hospital as a source of material.

² Solling, P., *Z. f. Immunitätsf. u. exp. Ther.*, 1937, **91**, 15.

³ Nattan-Larrier, L., Grimard, L., and Dufour, J., *Compt. Rend. Soc. de Biol.*, 1937, **125**, 358.