8109 C

Variation in Streptococcus Fibrinolytic Action on Human Plasma.

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Tillett and Garner[1] have shown that filtrates of young broth cultures of hemolytic streptococci of human origin can liquefy fibrin clots of normal human plasma. Tillett, Edwards and Garner[2] further found that resistance to this fibrinolytic action in plasma of patients during convalescence from streptococcus infections might indicate antibacterial immunity to that organism. Myers, Keefer and Holmes[3] recorded that this resistance in plasma of patients with rheumatic fever is comparable to that observed in plasma of patients with hemolytic streptococcus infections. Both groups of investigators used the same strain of organism having high fibrinolytic action (*i. e.*, strain CO) as the test organism. Hadfield, Magee and Perry,[4] however, called special attention to the variation in the fibrinolytic activity of different strains of hemolytic streptococci and they proposed to use at least 3 strains of lytic organisms in all tests. In view of the importance of this test in immunological studies, it occurred to us to determine the extent of the variation in the fibrinolytic action of different streptococci of human origin on plasma from normal individuals as well as from patients suffering from acute hemolytic streptococcus infections. An attempt to find a possible relation between this difference of action and the organisms isolated from different groups of diseases due to streptococci was also made at the same time.

The original technique of Tillett and Garner[1] was followed. All except one strain of streptococci were recovered from patients suffering from acute infections, the other being Dochez N. Y. 5, which was obtained from stock. They were grown in 0.05% dextrose meat infusion broth, pH 7.6, for from 18 to 24 hours before use. Blood specimens were collected by venapuncture into tubes containing 0.01 gm. potassium oxalate per cc. of blood. The plasma, after being separated by centrifugation, was tested within

[1] Tillett, W. S., and Garner, R. L., *J. Exp. Med.*, 1933, **58**, 485.

[2] Tillett, W. S., Edwards, L. B., and Garner, R. L., *J. Clin. Invest.*, 1934, **13**, 47.

[3] Myers, W. K., Keefer, C. S., and Holmes, W. J., *J. Clin. Invest.*, 1935, **14**, 119.

[4] Hadfield, D., Magee, V., and Perry, C. B., *Lancet*, 1934, **1**, 834.

24 hours. The actual test was assembled by mixing 0.2 cc. plasma diluted with saline to one cc., 0.5 cc. broth culture, and 0.25 cc. of 0.25% calcium chloride in normal saline. The mixture was incubated at 37°C. in a water bath. The time interval between clotting and complete dissolution of the clot was recorded in hours or fractions thereof. Any clot not dissolved in 24 hours was considered to be resistant.

A preliminary study of 19 strains of streptococci on a few specimens of normal human plasma confirmed the observation that under uniform conditions, different strains of hemolytic streptococci showed marked difference in ability to produce fibrinolysin.

From the data obtained, the following deductions might be made. The variation in the fibrinolytic power of different strains of hemolytic streptococci for normal human plasma is not uniform. While a rough correlation for each strain undoubtedly exists, the fibrinolytic action of each strain of streptococcus may vary as much as from 6 to over 24 hours. Even with organisms of fairly equal activity, the susceptibility of plasma of patients with streptococcus infections is again markedly different. In 2 instances, this difference was 5 hours, while in 4 other cases, it was more than 24 hours. Moreover, this difference in susceptibility of the plasma did not correspond to the different sources from which the strains were obtained. Plasma from a patient convalescing from scarlet fever has been shown to be resistant to a streptococcus isolated from a patient with puerperal sepsis, but susceptible to some of the scarlet fever strains. In view of the existence of so much variation in streptococcus fibrinolytic activity even among such a small series, caution in interpreting the results of this test as an index of immunity to streptococcus infections is indicated.

8110 P

Protection Against Experimental Typhus Infections (Peiping Strain) with Immune Mexican Typhus Serum.

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Zinsser and Castaneda[1] were able to produce an effective antityphus serum by prolonged immunization of a horse with formalin-

[1] Zinsser, H., and Ruiz Castaneda, M., *J. Exp. Med.*, 1933, **57**, 391.