

All but one of the animals tested (120) produced antisera. The normal sera of very few (2) gave feeble reactions above the lower dilutions (1:200) of the test antigens. §

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Influence of Acute Infection and of Artificial Fever on Plasma Lipoids.

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During another investigation on the lipoids of the plasma in children, it was observed in several instances that values for lecithin, cholesterol and total fatty acids were all markedly influenced by acute infections. Although the literature revealed the fact that cholesterol has previously been found to be lowered in certain acute infectious diseases^{1, 2} and in tuberculosis,^{3, 4} little is actually known

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¹ Denis, W., *J. Biol. Chem.*, 1917, **29**, 93.

² Kipp, H. A., *J. Biol. Chem.*, 1920, **44**, 215.

³ Eichelberger, L., and McCluskey, K. L., *Arch. Int. Med.*, 1927, **40**, 831.

⁴ Henning, B. H., *J. Biol. Chem.*, 1922, **54**, 167.

regarding the significance of this change and practically no information is available regarding the effect of infection on the lecithin and total fatty acid levels in the blood.

The various lipid fractions have been determined by the methods of Bloor^{5, 6, 7} in 15 children with various acute infections, first at the height of the disease and again after recovery. To ascertain the influence of fever *per se* as against that of the other effects of infection, determinations were made before, during and after the artificial production of fever, in one case of *dystonia progressiva deformans* by use of phenylethylhydantoin and in one case of chronic arthritis by diathermy. Determinations were also made before, during and after high fever on 2 occasions in each of 3 congenitally syphilitic children, who were inoculated with plasmodia malariae as a therapeutic measure. No particular attention was given to the factor of diet in the first 7 cases with acute infection, but in the other 13 cases studied a standard diet was given several days before and throughout the entire period of observation. The diet contained adequate amounts of vitamins and water and 2 gm. each of protein and fat and 5 gm. of carbohydrate per kilo of body weight. The 15 cases with acute infection were distributed as follows: Uncomplicated pneumonia, 6; pneumonia complicated by mastoiditis, otitis media or empyema, 3; uncomplicated acute tonsillitis and nasopharyngitis, 3, and one each of acute appendicitis, acute otitis media and acute rheumatic fever.

The results may be briefly summarized as follows: In every case of acute infection studied there was at the height of the disease a definite lowering of cholesterol, lecithin and total fatty acid. In all but one case the values became definitely subnormal but rose again to normal during convalescence. There appears to have been no constant relationship between the height of the fever and the degree of hypocholesterinemia or hypolecithinemia in these cases. Diet had no demonstrable influence on the results. The average value for the cholesterol at the height of the infection was 120 with variations between 61 and 175 mg. per 100 cc. of plasma. Corresponding figures for the lecithin at the time of the infection were, average 98, low 60, and high 150 mg. per 100 cc. The average value for cholesterol after recovery was 196 mg., while that of lecithin was 170 mg. per 100 cc. of plasma. Changes in the total fatty acid values paralleled those for the cholesterol and lecithin fairly closely

⁵ Bloor, W. R., *J. Biol. Chem.*, 1916, **24**, 227.

⁶ Bloor, W. R., *J. Biol. Chem.*, 1928, **77**, 53.

⁷ Bloor, W. R., *J. Biol. Chem.*, 1929, **82**, 273.

in most instances. The total leucocyte count tended to vary inversely with the lipoid content of the plasma.

The 3 cases of congenital syphilis showed definite hypocholesterinemia during the course of malarial infection but there was no significant difference between the values obtained at the height of the paroxysm and those found during the afebrile intervals. But one sample of plasma was taken after disappearance of the malaria under quinine therapy. This showed a rise in cholesterol from 85 to 170 mg. per 100 cc. The lecithin and total fatty acids remained within normal limits at comparatively constant levels in these 3 cases. That elevated body temperature *per se* is not responsible for the lowering of the various lipoid constituents is indicated by the fact that fever artificially produced by phenylethylhydantoin failed to have any such effect. The values in the 2 subjects examined were in the upper reaches of the normal zone before the hyperthermia was produced and remained at the same or at slightly higher levels during and after the febrile periods.

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Effect of Sprint Running on the pH of Venous Blood.

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(Introduced by H. C. Bazett.)

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Severe exercise which taxes the human organism to its limits has been shown to produce very profound changes in the blood. In these preliminary experiments, venous blood from 3 runners was obtained. As soon as possible after the run, blood from arm veins was drawn without CO₂ loss into syringes containing carefully neutralized potassium oxalate. The syringes were iced and immediately transported to the laboratory where the pH of the whole blood was determined at 38° C. with a glass electrode. The exercise consisted of running 440 and 880 yds. without competition. The runners were in different states of training, but the small number of determinations does not justify an attempt to correlate change in blood pH and muscular ability. The chief interest is that these pH values of blood after such severe exercise are probably some of the most acid ever obtained in normal subjects.

Great difficulties were encountered in drawing blood samples