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The Chylomicron Count in Diabetes Mellitus.

LEO ZON AND SHIELDS WARREN.

From the George F. Baker Clinic, New England Deaconess Hospital, Boston.

Gage[1] has called attention to the fact that following a fatty meal the blood is loaded with minute fat droplets which persist for a time and then disappear. Ludlum, Taft and Nugent[2] have made some studies on these particles and think that they are neutral fat droplets, stabilized by blood proteins. They think, therefore, that the counting of these particles gives a fair index of the fat content of blood. Bloor[3] has shown that these chylomicrons are increased in a diabetic dog. Several other clinical conditions have also been reported. It was thought that it would be interesting to examine blood of fasting diabetic patients and make counts, comparing these with normal fasting blood.

The chylomicrons were counted by Gage, and Ludlum, Taft and Nugent by noting the number of particles in a given area viewed through the micrometer eyepiece ruling while the slide was illuminated with a dark field condenser. In attempting to carry out this count, using a Zeiss cardioid condensor with an arc light, difficulties were encountered which are not mentioned by Gage, or Ludlum, Taft and Nugent.

Under brilliant illumination there were, indeed, the bright moving particles as described by these authors. These particles were not all of the same size. Some particles were about 0.1 micron in size and exhibited a slow Brownian movement. In addition to these, however, there were swarms of particles which graded slowly into invisibility. The most minute of these exhibited very rapid Brownian movements. It was as impossible to count these as to count gnats in a swarm. The number of these smaller particles depends greatly upon the intensity of illumination. Clearly, the count of such a mixture of large and small particles is a very inaccurate thing. In addition to this difficulty, it was noticed that if the plasma was allowed to stand for some time the number of particles increased. Under these circumstances the values given can only be considered as estimations.

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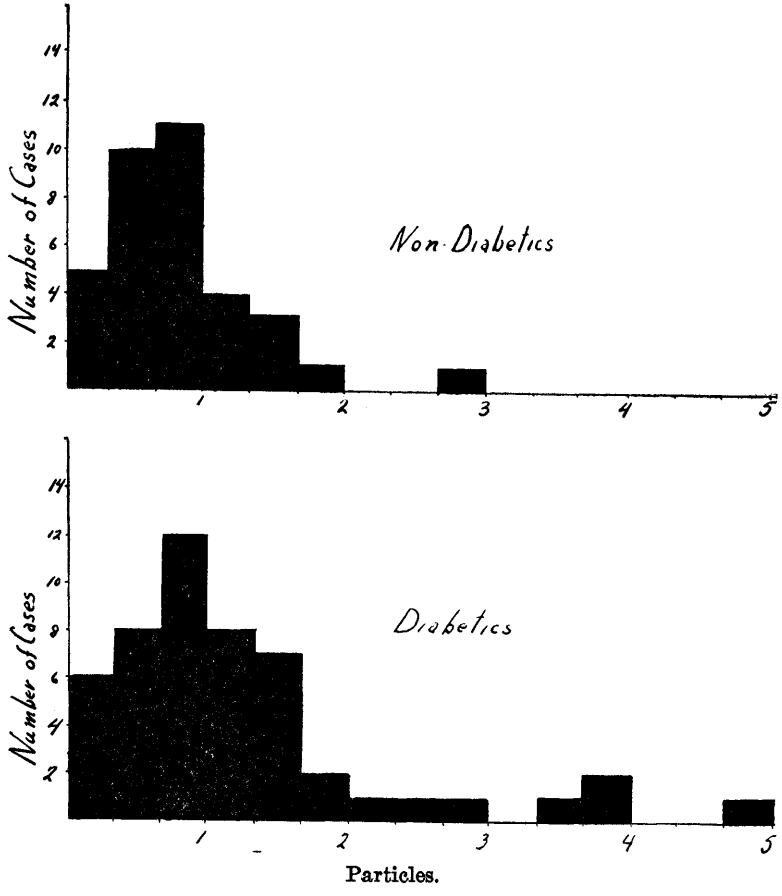
[1] Gage, S. H., and Fish, P. A., *The Cornell Veterinarian*, 1921, **11**, 143.

[2] Ludlum, S. D., Taft, A. E., and Nugent, R. L., *Colloid Symposium Monographs*, 1931, **8**, 269.

[3] Bloor, W. R., *J. Biol. Chem.*, 1916, **26**, 417.

The oxalated plasma was obtained from fasting specimens of blood. The chylomicrons were counted by placing a drop of plasma upon a thin slide and covering with cover slip. The oil lens was lowered until no dancing particles were seen and the position noted by reading the collar of the fine adjustment. The lens was slowly raised and the number of bright particles which flashed into view within an area of the eyepiece ruling was counted. This was continued until no more particles were visible in motion. The depth of the fluid was then read off from the collar. It was thus possible to calculate the number of particles per volume. In some cases, it was necessary to dilute the plasma with distilled water until the particles were far enough apart to be counted.

The distribution of particles in 46 non-diabetic and 56 diabetic cases is shown. The majority of cases in both groups fall about the same mean. Among the diabetics there are cases with very



high counts. In addition to those shown in the chart there were 3 diabetic cases showing 10 particles per 100 cubic micra and one showing 45 particles. When the clinical records of the patients who showed very high counts were examined, it was found that the samples of blood were taken before their diabetes was well regulated.

We can conclude, therefore, that controlled diabetics have a fasting chylomicron count about the same as that of normal persons. The unregulated diabetics have a higher count than normal.

In the majority of cases cholesterol determinations were done on the blood. There was no correlation with the chylomicron count, very high counts being found in some instances with low normal cholesterol values, and low counts being obtained in cases with moderately high cholesterol values. The determinations of total lipid have not been made on the material.

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Effect of Pituitrin Injection in Rabbits on Serum Osmotic Pressure and Blood Picture.

ALFRED GILMAN AND LOUIS GOODMAN.

From the Department of Pharmacology and Toxicology, Yale University, School of Medicine.

Dodds and Noble[1] reported that a single massive subcutaneous dose of pituitrin in rabbits resulted in a severe anemia on the 4th to 5th day after injection. This anemia was macrocytic, hyperchromic and accompanied by a marked leucocytosis, reticulocytosis, and an increase in bile. Dodds and Noble are inclined to entertain the possibility "that the control of blood destruction by the reticulo-endothelial system may be vested outside the system and may reside in the posterior lobe of the pituitary gland."

In view, however, of the well-known antidiuretic action of pituitrin, and the high water content of a rabbit's normal diet, it was thought that this anemia might well be due to serum osmotic changes resulting from water retention, rather than to a "hemoclastic principle" of the posterior pituitary.

In over 20 preliminary experiments on 15 healthy adult rabbits, pituitrin was injected subcutaneously in the dose reported by Dodds,

[1] Dodds, E. C., and Noble, R. L., *Nature*, 1935, **135**, 788.