Blood Flow and Metabolic State of the Adipose Tissue

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It was intended to observe whethere metabolic state of the fatty tissue was reflected in the blood flow through the tissue.

Methods: (A) The blood flow through the fatty tissue (F.B.F.) was determined with ^{133}Xe local clearance according to Larsen and Lassen. The thickness of the fatty tissue was measured with a needle inserted vertically to the fascia of the abdominal muscles and/or at the other sites of the body. Materials included five diabetes mellitus, three essential hyperlipemia, four patients with long-tern steroid therapy and eleven obesity. (B) In relation between glucose tolerance and G.B.G., special observations were carried out on four patients with long-term steroid therapy (two the diabetic due to steroid, two the non-diabetic). The procedure of glucose tolerance was as the following: fifteen gm of glucose mixed with 10μCi of glucose-^{14}C (U) was intravenously injected, and then for three hours at interval of 30 minutes the blood sugar levels and expired $^{14}CO_2$ were measured.

Results: (1) In a patient of essential hyperlipemia, F.B.F. was different from the parts of the body: fatty tissue in abdomen, buttock, xanthoma. This suggested that F.B.F. was not always same at the sites of the fatty tissue. (2) Although F.B.F. in the abdominal fatty tissue was decreased with increasing thickness of the fatty tissue, this relation was not statically significant. (3) Little relationship was seen between F.B.F. and thickness of the fatty tissue, particularly in the diabetic and/or patients with long-term steroid therapy. (4) Comparable observations were made in four patients with the same thickness (28mm) of the abdominal fatty tissue, two of whom were steroid-diabetes and the other two were the non-diabetic. F.B.F. in the diabetic was 6.6 ml/100 g/min. and that in the non-diabetic was 3.2 ml/100 g/min. The glucose tolerance curve in the steroid-diabetes was poor, and the expired $^{14}CO_2$ for three hours of the diabetic was about half of the non-diabetic. The adipose tissue of the steroid-diabetes was probably at lipolytic state.

Conclusions: (1) There was little reverse relationship between F.B.F. and thickness of the adbominal fatty tissue in the heterogenous metabolic diseases; that was in disagreement with the result of Larsen & Lassen whose observations were on hogenous obesity. (2) It seems likely that F.B.F. increases at lipolytic state of the fatty tissue.

Fatty Acids Metabolism in Obese and Hyperlipidemic Mice Induced with Goldthioglucose

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In a previous study, we reported the characteristic abnormality of fatty acids metabolism by whole blood cells and platelets from human arteriosclerotic hyperlipidemic subjects. There was a striking increase of ^{14}C-incorporation from 1-^{14}S-acetate into oleic acid, in contrast to control's.

In this report, we studied fatty acid metabolism in Goldthioglucose treated mice. Mice used in this report were CBA strain, weighing 20-25 cm (control) and obese and hyperlipidemic ones induced with Goldthioglucose (GTG).