Acetal Phosphatides in the Adipose Tissue of Newborn Rats. (22277)

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Since the discovery of acetal phosphatides by Feulgen and Voit(1) a considerable amount of work has been done upon the distribution and isolation of acetal phosphatides in tissues. Few investigators have made quantitative chemical studies of the metabolic role of these compounds. Stetten and Schoenheimer(2), basing their conclusions upon experiments utilizing deuterium labeled compounds, have indicated that fatty aldehydes may be intermediates in the interconversion of fatty acids and fatty alcohols. On the other hand, Ehrlich and Waelsch(3), also using deuterium labeled fatty acids, concluded that fatty aldehydes were not directly involved in the overall synthesis or transport of fatty acids. The suggestion that acetal phosphatides are involved in both the anabolism and catabolism of fatty acids has been made by Danielli(4), Fawcett(5), Schäfer (6) and Möckel(7). Möckel, basing his conclusions upon a series of histological studies of the adipose tissues of newborn rats and of rats subjected to starvation, proposed that the anabolism and catabolism of neutral fat follows the pathway of fatty aldehyde to acetal phosphatide.

Because of the need for quantitative chemical data on the changes in acetal phosphatide content of tissues actively engaged in lipid metabolism it was decided to investigate the changes in acetal phosphatide in relation to phospholipid and total lipids in the adipose tissues and livers of newborn rats over the first 21 days of life.

Materials and methods. Newborn rats at 1, 2, 3, 5, 8, 15 and 21 days of age were sacrificed by decapitation. The livers and samples of subcutaneous adipose tissue from the pectoral and pelvic regions were removed and freed from foreign tissue. In age groups 1, 2, 3, 5 and 8 days, tissues of 2 or 3 animals were pooled. In pooling tissues, care was taken to assure that the number of animals taken from any one litter was the same for each age group. The lipid of the tissues was extracted by the method of Rice and coworkers(8). The extracts were then analyzed for acetal phosphatide, total phospholipid and total lipid. Acetal phosphatides were determined by the method of Feulgen, Boguth and Andresen(9). Phospholipid phosphorus was determined by the procedure of Fiske and Subbarow(10). Total lipids were determined gravimetrically.

Results. The results are summarized in Table I. This table represents the average results from 2 separate series of experiments. In each series the changes noted were parallel and of the same order of magnitude. Preliminary experiments where only acetal phosphatides were determined had shown that

TABLE I. Lipid Changes in Adipose Tissues and Livers of Rat during First 3 Weeks of Life.*

	Adipose tissue			Liver		
Age, days	Total lipid, %	Phospholipid phosphorus, μmoles/g	Acetal phosphatide, μmoles/g	Total lipid, %	Phospholipid phosphorus, μmoles/g	Acetal phosphatide, μmoles/g
1	19.1	28.10	1.72	7.31	25.2	.401
2	29.0	25.40	1.02	4.10	19.5	.508
3	42.5	17.90	.61	4.67	18.8	.392
5	45.8	1.90	.21	5.43	27.3	.406
8	61.5	1.24	.05	5.41	28.7	.383
15	59.1	3.37	.08	4.63	31.2	.472
21	68.9	1.71	.03	4.98	36.1	.307

* All values in terms of wet wt of tissue.

there was some variation among litters in values obtained from animals at the first 3 age groups. This variation was associated with the number of animals in the litter, since animals from the larger litter showed a higher initial acetal phosphatide content in the adipose tissue. The changes associated with increased age for each litter were parallel and of the same order of magnitude. In the experiment described above and where tissues were pooled, the variation among litters was minimized by keeping the number of animals from any one litter the same for each age group.

Discussion. The changes in the lipid fractions of the liver with increased age in newborn rats were within normal adult limits and little significance can be attributed to them. These data, however, do not exclude the possibility that acetal phosphatides may be involved in the lipid metabolism of the liver by means of a turnover mechanism. In adipose tissue, on the other hand, the maximum changes occurred during the first 5 days of life. The initially high levels of acetal phosphatide and total phospholipid decreased rapidly to only trace amounts as the adipose tissue filled with fat. The results confirm and extend the observation of Möckel(7). The inverse changes in acetal phosphatide and phospholipid, as compared to total lipid, indicate that they are in some way involved in the laying down of fat in adipose tissue. Acetal phosphatides could be involved directly in this mechanism or they could be involved in the synthesis of other phospholipids which could then play some role in the fat metabolism of adipose tissue.

Summary. The changes in the acetal phosphatide, phospholipid and total lipids have been followed in the adipose tissues and livers of newborn rats over the first 3 weeks of life. As the adipose tissue fills with fat, the acetal phosphatide and total phospholipid, initially quite elevated, decrease rapidly to only trace amounts by the fifth to eighth day of life. These results indicate that acetal phosphatides and phospholipids are involved in some manner in the laying down of fat in adipose tissue.

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Effect of Para-Aminosalicylic Acid on Serum Isoniazid Levels in Man. (22278)

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Previous investigations(1,2) with chemical methods have shown wide variations in the rate of metabolic alteration of isoniazid (INH) from person to person, but a relatively constant rate in any one individual. This observation is of clinical importance because only the free, unaltered isoniazid has significant antimicrobial activity against tubercle bacilli(3). One of the major pathways of metabolic disposition of INH is by acetylation(1). *In vitro* experiments by Johnson (4) have shown that para-aminosalicylic acid (PAS) inhibits the acetylation of INH by a competitive mechanism.