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## Failure of Choline Therapy to Alter Serum Lipids in Patients with Coronary Artery Disease.* (20548)

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The influence of lipotropic agents upon serum lipids has been studied extensively(1). Chemical studies in patients treated with these drugs over a prolonged period of time have been relatively few; in many of these investigations, the number of determinations have not always been sufficient to minimize the possible error due to spontaneous fluctuations of the serum lipids. For this reason, a long term study was undertaken.

*Method.* The present observations were made on 11 ambulatory patients, 10 males and one female, ranging in age from 28 to 57 years. Ten subjects had definite arteriosclerosis as evidenced by coronary insufficiency, or previous myocardial infarction, or both; the remaining patient was a member of a family with a striking family history of arteriosclerosis and was suspected of having coronary artery disease. The patients were studied for periods ranging from 6.5 to 15.5 months. Each consumed a self-selected diet. Before starting therapy, at least 3 chemical analyses were done in each case during a control period which varied from one to 5 months. Choline, which is considered the most effective lipotropic agent(2), was given orally in divided doses, as choline dihydrogen citrate (equivalent to 4.5 g of choline base daily), for periods ranging from one to 4 months. These were alternated with control periods ranging from one to 6 months. The serum cholesterol and serum lipid phosphorus were determined at the end of each choline period, at the end of each control period and also at intervals during these periods. The phospholipid:total cholesterol ratio (P/TC) was calculated according to the formula: Lipid P (mg %) x 25/Total Cholesterol (mg %). All determinations were done in duplicate; phospholipids were determined by a modified Whitehorn method(3) and cholesterol by the method of Schoenheimer-Sperry(4). Weight of the patients was recorded at intervals during the study.

*Results.* Table I summarizes the results obtained. It will be observed that choline therapy did not influence the levels of the total cholesterol and lipid phosphorus when compared to the control values. It is interesting to note that the mean during the control studies for lipid phosphorus was 11.1 mg %, total cholesterol 253 mg % and P/TC 1.10. Under choline therapy, the means for

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TABLE I. Average Levels of Serum Lipid Phosphorus (LP), Total Cholesterol (TC) and Phospholipid/Total cholesterol ratio (P/TC) in patients with coronary artery disease during control periods and while on choline therapy.

| | | Control periods | | | | | Choline therapy | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sex and age | Diagnosis | Duration of study, mo | No. of assays | Avg LP, mg % | Avg chol., mg % | Avg P/TC | Duration of study, mo | No. of assays | Avg LP, mg % | Avg chol., mg % | Avg P/TC |
| ♂, 53 | Coronary insufficiency | 7.5 | 7 | 13.4 | 372 | .90 | 8 | 6 | 14.2 | 392 | .90 |
| ♂, 48 | Myocardial infarction | 9 | 8 | 11.4 | 287 | 1.00 | 5.5 | 3 | 10.1 | 268 | .94 |
| ♀, 40 | " | 8 | 9 | 10.7 | 246 | 1.08 | 7.5 | 5 | 10.3 | 241 | 1.07 |
| ♂, 28 | Coronary insufficiency | 8 | 6 | 9.2 | 217 | 1.06 | 2 | 1 | 8.4 | 218 | .96 |
| ♂, 48 | Myocardial infarction | 7 | 7 | 9.5 | 211 | 1.12 | 7 | 5 | 9.1 | 219 | 1.04 |
| ♂, 40 | Coronary insufficiency | 6 | 6 | 11.6 | 236 | 1.23 | 3.5 | 2 | 11.2 | 246 | 1.13 |
| ♂, 43 | Myocardial infarction | 10 | 6 | 13.4 | 256 | 1.31 | 4 | 2 | 15.5 | 305 | 1.27 |
| ♂, 53 | Coronary insufficiency | 5 | 4 | 10.3 | 235 | 1.09 | 1.5 | 1 | 8.2 | 220 | .93 |
| ♂, 46 | " | 5 | 4 | 11.7 | 264 | 1.11 | 1.5 | 1 | 13.6 | 270 | 1.26 |
| ♂, 57 | " | 5 | 4 | 12.2 | 261 | 1.17 | 1.5 | 1 | 13.9 | 255 | 1.36 |
| ♂, 52 | No known heart disease | 5 | 4 | 9.0 | 194 | 1.16 | 1.5 | 1 | 11.3 | 212 | 1.33 |
| Mean | | | | 11.1 | 253 | 1.10 | | | 11.4 | 259 | 1.10 |

these lipid values were strikingly similar; the lipid P was 11.4 mg %, the total cholesterol 259 mg %, and the P/TC 1.10. During the entire period of observation, there were no significant alterations in body weight. It may be of interest to record that case No. 1, a male aged 50, with a severe anginal syndrome, developed an acute myocardial infarction while on choline therapy.

*Conclusion.* The oral administration of 4.5 g of choline base daily for 1.5 to 8.0 months to 11 patients with coronary insufficiency or myocardial infarction or both, failed to alter the total serum cholesterol, the serum lipid phosphorus and the phospholipid:total cholesterol ratio.

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