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# Influence of Vitamin E (d-l-Alpha Tocopherol Acetate) on Blood Cholesterol and Fatty Acids of Male Schizophrenics.*

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The demonstration by Adamstone[1] of a marked decrease in brain cholesterol in chicks with encephalomalacia on a diet deficient in Vitamin E (d-l-alpha tocopherol) suggested the present study of the influence of large doses of Vitamin E on the blood cholesterol and fatty acids of 8 adult male patients with schizophrenia.

*Experiment.* Patients on bed rest were given a daily diet of 200 g of CHO, 63 g of P and 53 g of F, yielding 1500-1600 calories, during the study period and for 2 weeks prior to the use of large doses of Vitamin E. Two fasting blood samples were taken from the cubital veins, a day apart, just before the ingestion of Vitamin E, and single specimens were obtained thereafter at 7-10-day intervals for 77 days. The quantitative determination of cholesterol and fatty acids was made by the methods of Lieberman-Burchard[2] and Bloor[3] respectively.

The administration of Vitamin E was discontinued for 3 periods during the study in order to detect any changes during temporary discontinuance of Vitamin E. During the 77-day period, 5345 mg of Vitamin E were given *per os* as follows: 570 mg during the first 11 days; discontinued 7 days; 2425 mg the next 25 days; discontinued for 13 days; 2350 mg the next 16 days and then discontinued for the last 5 days. One hundred fifty-two days later the same patients were given the same diets except that no Vitamin E was administered and control blood studies were made at weekly intervals for 70 days.

*Results.* Blood cholesterol and fatty acids values are shown on Table I. The trend of values for cholesterol during the experimental period shows little variation. At the end of the first week on Vitamin E a 10% increase was noted over the mean value of all controls taken

* The Hastings State Hospital wishes to state its sincere appreciation to the Hoffman LaRoche Co., for supplying gratis the Vitamin E that was used in this investigation.

1 Adamstone, F. B., *Arch. Path.*, 1941, **31**, 711.

2 Evelyn Photoelectric Colorimeter, Bulletin 46, p. 32 (Modified Lieberman-Burchard Reaction).

3 Bloor, W. E., *J. Biol. Chem.*, 1916, **24**, 447.

TABLE I.

The following values show the blood cholesterol (C*) and fatty acids (FA†) in mg per 100 ml at weekly intervals on each patient while he received Vit. E; as compared with a like period of time when he served as a control.

| Patient | | 1st wk‡ C* | FA† | 2nd wk C | FA | 3rd wk C | FA | 4th wk C | FA | 5th wk C | FA | 6th wk C | FA | 7th wk C | FA | 8th wk C | FA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 1 | On Vit. E | 150 | 352 | 165 | 420 | 140 | 390 | 175 | 395 | 188 | 385 | 178 | 408 | 162 | 340 | 160 | 348 |
| | Control | 145 | 315 | 152 | 322 | 142 | 360 | 148 | 360 | 158 | 332 | 153 | 340 | 158 | 352 | 153 | 322 |
| No. 2 | On Vit. E | 182 | 440 | 232 | 536 | 240 | 560 | 238 | 510 | 242 | 540 | 192 | 530 | 215 | 450 | 213 | 444 |
| | Control | 195 | 360 | 194 | 398 | 192 | 365 | 178 | 365 | 176 | 363 | 176 | 375 | 172 | 355 | 172 | 370 |
| No. 3 | On Vit. E | 122 | 328 | 162 | 410 | 128 | 342 | 138 | 344 | 152 | 372 | 174 | 382 | 136 | 374 | 132 | 365 |
| | Control | 155 | 345 | 160 | 355 | 148 | 373 | 158 | 355 | 162 | 358 | 160 | 335 | 160 | 345 | 168 | 330 |
| No. 4 | On Vit. E | 182 | 460 | 225 | 525 | 185 | 525 | 205 | 508 | 215 | 484 | 215 | 466 | 174 | 442 | 178 | 430 |
| | Control | 210 | 400 | 215 | 395 | 200 | 370 | 210 | 390 | 200 | 375 | 200 | 360 | 188 | 384 | § | § |
| No. 5 | On Vit. E | 162 | 425 | 180 | 452 | 162 | 440 | 160 | 390 | 168 | 385 | 158 | 360 | 152 | 385 | 166 | 382 |
| | Control | ‖ | | | | | | | | | | | | | | | |
| No. 6 | On Vit. E | 135 | 390 | 158 | 400 | 172 | 408 | 220 | 510 | 168 | 485 | 184 | 442 | 162 | 395 | 182 | 404 |
| | Control | 172 | 355 | 176 | 363 | 168 | 320 | 166 | 365 | 172 | 330 | 162 | 340 | 160 | 355 | 155 | 340 |
| No. 7 | On Vit. E | 140 | 315 | 162 | 380 | 134 | 370 | 132 | 330 | 144 | 340 | 146 | 348 | 122 | 320 | 126 | 335 |
| | Control | 132 | 310 | 136 | 315 | 128 | 325 | 142 | 338 | 136 | 320 | 124 | 330 | 120 | 334 | 128 | 322 |
| No. 8 | On Vit. E | 172 | 485 | 196 | 462 | 172 | 450 | 160 | 420 | 196 | 370 | 160 | 380 | 162 | 375 | 176 | 395 |
| | Control | 190 | 370 | 188 | 358 | 187 | 358 | 190 | 370 | 195 | 365 | 192 | 390 | 196 | 380 | 192 | 368 |

C*—Cholesterol.
FA†—Fatty acids.
‡First cholesterol and Fatty acid (under first week) are values before Vit. E administered.
§On home visit.
‖No control series—patient on home visit.

over a 70-day period. After the first week, there was a marked increase of over 25% of the fatty acids values while on Vitamin E as compared with the mean fatty acids value of the controls taken over the entire control period. The fatty acids values for the patients on Vitamin E decreased gradually over the experimental period until there was a difference of only 5% as compared with the mean value of the entire control period. This study indicates that large doses of Vitamin E cause a primary increase in fatty acid content of the blood of male patients with schizophrenia. Studies are being carried on at this time to determine the cause and significance of these changes.