THE INFLUENCE OF ULTRAVIOLET IRRADIATION OF THE SKIN ON THE CIRCULATING BLOOD LIPIDS IN MAN*

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In the past the suggestion has often been made that sunlight is a precipitating factor in the pathogenesis of atherosclerosis.

The aim of this paper was to collect data on the influence of ultraviolet irradiation on the blood lipids.

MATERIAL AND METHODS

Hospitalized patients who were out of direct sunlight for at least 1 week were exposed to increasing amounts of ultraviolet irradiation for 1 week. Blood lipids were estimated directly before and directly after completion of the course of irradiation. The patients were kept on the ordinary hospital diet. Twelve patients suffering from chronic skin diseases (ulcus cruris, neurodermatitis, acne vulgaris, and plantar warts) were used in these experiments. Patients 1 - 7 were White and 8 - 12 were Bantu. Patients 8 and 11 were albino Bantus. In the case of the Whites and albinos, irradiation with a high-pressure mercury lamp (Hanau) was started on the chest and back for 1 minute and increased by half a minute daily for 7 days, at a distance of 24 inches. The other Bantus were initially exposed for 2 minutes with a daily increase of 1 minute.

RESULTS

The results are shown in Figs. 1 - 5 and Table I. The fluctuations before and after irradiation were insignificant in the following estimations which are not shown in the figures: α_1 and α_2 cholesterol, β lipoproteins, β cholesterol, phospholipids, free cholesterol, cholesterol esters, and percentage esters of the total.

COMMENT

In the case of total cholesterol the changes were also insignificant, with no constant tendency to either a decrease or an increase (Fig. 1). The α_1 and α_2 lipoproteins showed a tendency to increase after irradiation in 8 out of 10 patients (Fig. 2). A very marked decrease after irradiation was noted for the neutral fats in 7 of the 12 patients. In 2 there was a slight increase, and in the other 3 the fluctuations were minimal (Fig. 3). A similar tendency to decrease after irradiation was also noted, but to a lesser degree, for the total fatty acids and total lipids (Figs. 4 and 5). The cholesterol-phospholipid ratio was slightly increased in nearly all the patients (Table I).

According to these experiments, ultraviolet irradiation seems to decrease the neutral-fat values of the blood, while no influence was noted on the cholesterol values. There also seems to be an increase of the α_1 and α_2 lipoproteins.

At present the significance of these findings remains obscure.

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TABLE I. CHOLESTEROL-PHOSPHOLIPID RATIO

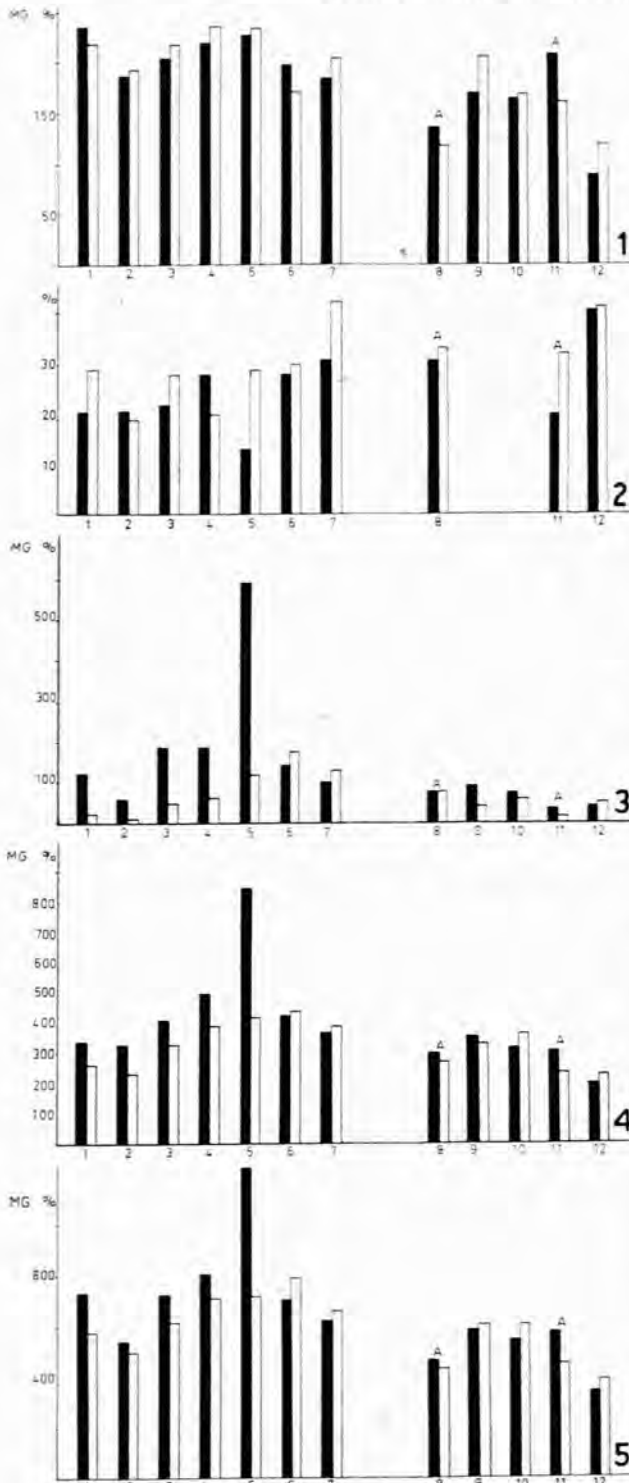| Patient	Before irradiation	After irradiation
1	0·93	1·03
2	0·97	0·97
3	0·95	0·96
4	0·79	0·84
5	0·82	1·00
6	0·82	0·73
7	0·81	0·98
8	0·78	0·72
9	0·78	0·93
10	0·71	0·80
11	1·00	0·89
12	0·73	0·80

Fig. 1. Total cholesterol. Fig. 2. α_1 and α_2 lipoproteins. Fig. 3. Neutral fats. Fig. 4. Total fatty acids. Fig. 5. Total lipids. [In Figs. 1 - 5, numbers 1 - 7 represent the White patients, numbers 8 - 12 the Bantu (A=albino). The black columns represent estimations before irradiation, the white after irradiation.]
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