Indian Journal of
Dermatology & Venereology

(Incorporating Indian Journal of Venereal Diseases & Dermatology)

Vol. 32; No. 1. January-February 1966

ORIGINAL ARTICLES

SERUM CHOLESTEROL IN SKIN DISEASES

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The essential factors in the etiology and pathogenesis of many skin diseases are still unknown. Racial, hereditary and individual disposition seem to have a bearing on the development of certain skin diseases. Controversial and debatable reports are available regarding biochemical changes in some of the skin diseases.

Tickner and Mier (1960) studied serum cholesterol, uric acid and proteins in psoriasis and postulated that psoriasis is associated with some abnormality of lipid metabolism. Serum cholesterol is known to vary according to age, sex, diet, hormonal and emotional factors as well as other environmental factors. The race of the individual may also influence the serum cholesterol level. As different types of fats are used in the diet of the different regions of India, the serum cholesterol levels have been found to be different.

The iodine values of the common fats used in the different regions of India are given in the table below :

(Boyd and Roy, 1926, Bose and De, 1936) in a tabular form.

	Type of oil				Iodine value
1.	Groundnut oil	...	...	...	85 to 99
2.	Mustard oil	...	...	...	96 to 108
3.	Til oil	...	...	...	105 to 115
4.	Coconut oil	...	...	...	7 to 10
5.	Pure ghee	...	...	...	30 to 35
6.	Hydrogenated oil	...	...		Much less, depends on the degree of hydrogenation

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Received for Publication 15-12-65.

Studies conducted in various parts of India to determine normal serum cholesterol level show different results. This is not only due to the differences in dietary fat used in different regions but also due to the different techniques employed for such studies. It was therefore difficult to compare the results obtained from two different regions.

Shukla and Sayed (1960) established the serum cholesterol levels amongst a normal Gujarati population. This enabled us to compare the serum cholesterol levels of our skin patients. In order to make the comparison valid the present study was conducted in the same laboratory, using the identical technique and procedure.

MATERIAL AND METHODS

The sample consisted of 240 patients attending the out patient and the in-patient skin and V. D. department of S. S. G. Hospital, Baroda. Only those patients who were not taking any drugs or special diet were included in this study. Women who were menstruating or pregnant and those patients who had thyroid disease, idiopathic diabetes mellitus, liver and biliary disease, familial hypercholesterolaemia, xanthomas or nephrosis were excluded from the study.

The blood samples were collected daily between 9 and 10 a. m. The modified method of Bloor et al, quoted by Kolmer (1951) was employed for total serum cholesterol estimation.

RESULTS

TABLE I

Showing number of patients in each group

Psoriasis	30 cases
Pemphigus	10 cases
Lichen Planus	20 cases
Herpes Zoster	20 cases
Seborrhoeic dermatitis	20 cases
Allergic dermatitis	30 cases
Eczema	30 cases
Tuberculosis cutis	30 cases
Acne Vulgaris	20 cases
Pellagra	10 cases
Extensive Pyodermas	20 cases
	240 cases

TABLE 2

Showing percentages of cases in various diseases and their serum cholesterol level

Serum cholestrol level in mgm%	Percentage of cases										
	Psoriasis 30 cases.	Pemphigus 10 cases	Lichen Planus 20 cases	Herpes zoster 20 cases	Seborrhoeic dermatitis 20 cases	Acne vulgaris 20 cases	Allergic dermatitis 30 cases	Eczema 30 cases	Tubercu-losis cutis 30 cases	Pellagra 10 cases	Extensive pyoderma 20 cases
100–150	7%	10%	70%	20%	5%	5%	30%	14%	30%	10%	70%
151–200	46%	40%	25%	45%	30%	50%	37%	43%	30%	40%	20%
201–250	24%	20%	—	35%	40%	35%	23%	33%	40%	20%	10%
251–300	13%	30%	5%	—	15%	10%	7%	7%	—	20%	—
301–350	10%	—	—	—	10%	—	3%	3%	—	10%	—

TABLE 3

Showing number of cases, mean, S. D., and S. E. of mean of the serum cholesterol level in mgm. % in various diseases.

Serum cholestrol level in mgm %	Psoriasis	Pemphigus	Lichen-planus	Herpes-zoster	Seborrhoeic dermatitis	Acne vulgaris	Allergic dermatitis	Eczema	Tubercu-losis cutis	Pellagra	Extensive Pyoderma
No. of cases	30	10	20	20	20	20	30	30	30	10	20
Mean	191.5	165.0	167.5	170.0	210.0	177.0	180.0	181.0	180.0	200.0	170.0
S. D.	71.0	64.0	32.5	44.5	65.5	55.5	53.5	57.0	41.5	71.5	27–0
S. E. of mean	4.10	6.40	2.31	3.14	4.62	3.95	3.11	3.31	2.40	7.20	1.91

The mean values of the above 11 types of diseases were compared with the mean of the normal cases. From statistical tests it was observed that there is no significant difference between the mean value of serum cholesterol level of the seborrhoeic patients and the normal patients. The rest of the mean values (for the remaining 10 types of diseases) were found significantly different from the mean of the normal patients. In fact all these 10 means wear not only significantly different from the mean of normal patients but also were lower than the mean of normal patients.

TABLE 4

Normal Cases**

No. of cases	169
Mean	216.7
S. D.	47.0
S. E. of mean	3.68

**Shukla & Sayed (1960)

DISCUSSION

A large quantity of phospholipids and cholesterol are present in the membranes of all cells. It has been claimed that cholesterol and the phospholipids may have a controlling effect over the permeability of cell membranes. Thus cholesterol helps in maintaining the physical integrity of cells throughout the body. Cholesterol esters are perhaps a means for transporting fatty acids in the blood. Cholesterol is used in many tissues of the body for the formation of their necessary substances. In the adrenal gland, for instance, cholesterol can be transformed into the adrenocortical hormones. Some female sex harmones and probably the male sex harmones can also be formed by transformation of cholesterol.

A relatively large quantity of cholesterol is present in the skin. Cholesterol and other lipoid substances of the skin make the skin resistant to the absorption of water -soluble substances and to the action of many chemical agents. Cholesterol also, helps to prevent evaporation of water from the skin, without this protection the amount of evaporation would be 15 to 20 litres a day instead of the usual 300 to 400 ml.

Cholesterol thus seems to be related to skin functions and also perhaps to skin pathology.

It is interesting therefore to note that in the majority of the skin diseases we studied, the cholesterol level is significantly lower than the normal, while in seborrhoeic dermatitis, the cholesterol level shows no significant difference from the normal.

CONCLUSION

The serum cholestrol level of 240 patients sufferieng from different skin conditions has been studied and a statistical comparison has been made with a normal control group.

In a majcrity of the skin diseases, the serum cholestrol level was found to be significantly lower than in the normal group. In seborrhoeic dermatitis however no significant difference was found.

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