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Lipid Profile in Sudanese Patients with Atopic Eczema (Atopic dermatitis)

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Original Research Article

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Abstract: This study was carried out between February and April 2017. This study aimed to evaluate serum lipid profile (Total cholesterol (T CHOL), triglycerides (TG), high density lipoprotein (HDL) and low density lipoprotein (HDL)) in atopic dermatitis (AD) patients. Atopic eczema is a very common skin condition. It may start at any age but the onset is often in childhood. It may also start later in life in people who did not have Atopic eczema as a child. Blood samples were collected into plain containers from each participant (40 patients and 40 healthy individuals as control). Serum lipids were measured with semi-automated analyzer Spec BTS 350 using enzymatic methods. Data were analyzed using SPSS version 16 and presented as mean ± SD. P value < 0.05 was considered significant. The means of T CHOL in the patients and control group were (145 mg/dl ±47) and (162 mg/dl ±12) respectively. The means of TG in the patients and control group were (100 mg/dl ± 60) and (115 mg/d ±22) respectively. The means of HDL in the patients and control group were (31 mg/dl ±7) and (70 mg/dl ±5) respectively. The means of LDL in the patients and control group were (93 mg/dl ±38) and (69 mg/dl ±11) respectively. Results of the patients when compared to that of the controls, showed a significant decrease in CHOL (P = 0.02) and HDL (P = 0.00), a significant increase in LDL (P = 0.00) and no significant difference in TG (P = 0.15). Sera of Sudanese patients with atopic dermatitis showed a significant higher level of LDL, lower level of HDL and total cholesterol and no change in triglyceride level when compared with non-atopic dermatitis controls.

Keywords: Atopic dermatitis (Atopic eczema), Lipid profile.

INTRODUCTION

The term "Eczema" derived from the Greek word for "Boiling" which reflect that the skin becomes acutely inflamed that fluids weep out or vesicles appear. In developed world eczema accounts for a large proportion of skin diseases, both in hospital and community. Atopic eczema is a one type of eczema that may start at any age but the onset is often in childhood. It may also start later in life in people who did not have atopic dermatitis (AD) as a child 6. Atopic eczema or AD is a common condition affecting approximately 17% of the population, with slight female preponderance (1.3:1 in children).The incidence has increased twofold to threefold since the 1970s5. In atopic dermatitis skin tends to be easily irritated and appears dry. These clinical peculiarities correspond to impaired barrier function and to increased transepidermal water loss (TEWL) value [1]. A few studies suggest that, abnormal serum lipids are associated with increased risk of CVD [2,3] or stroke[4]. Lipids and lipoproteins are the central to the energy metabolism of the body, as well as their association with coronary heart disease (CHD)[7].

Cholesterol is an unesterified steroid alcohol containing four rings A, B, C and D. It has a single C-H side chain tail similar to a fatty acid in its physical properties. Also it is an amphipathic lipid and is found on the surface of lipid layers along with phospholipids [8]. Cholesterol facilitates triglyceride transport by lipoproteins for maintaining the normal structure and integrity of cell membranes and it acts as a precursor for steroid hormones synthesis [7].

Triglycerides (TG) contain three fatty acid molecules attached to one molecule of glycerol by ester bonds. Each of these fatty acids can be different in structure, thus producing many possible structural forms of triglycerides[8]. High density lipoprotein (HDL) is the smallest and most dense lipoprotein particle. It is synthesized by both liver and intestine. It has the ability to remove excess cholesterol from peripheral cells (good cholesterol)[7,8].

Low density lipoprotein (LDL) contains apo B100 and is more cholesterol rich than other Apo B containing lipoproteins [9]. It is readily taken up by cells via the LDL receptors in the liver and peripheral cells. Because of the small particles size of the LDL,

they can infilterate into the extracellular space of the vessel wall, where they can be oxidized and taken up by macrophages through scavenger receptors [7].

Study design

This is a descriptive case control study in Dermatology and Venereology hospital at Khartoum state,during the period from February 2017-April 2017.

Study group

A study group of randomly selected 40 patients who were diagnosed as atopic dermatitis and a control group of 40 normal healthy individual at Khartoum state. An inclusion criterion is patients already diagnosed as atopic eczema (or atopic dermatitis), an exclusion criteria is any patient have other atopic diseases, diabetes mellitus, hypertension and cardiovascular diseases.

Blood samples were collected from the patients after fulfillment the questionnaire as well as control group, using disposable syringes under a septic condition. The blood was drowning in heparin containers and then centrifuged at 3000 RPM for 3 min to obtain plasma. Hemolyzed samples were rejected and excluded from study; two ml of plasma was preserved at -20^{0}c prior to analysis for total cholesterol, high density lipoprotein cholesterol, low density lipoprotein cholesterol and triglycerides.

Serum lipids were measured with semi-automated analyzer spec BTS 350 using different reagent kits. [Serum TG: (enzymatic GPO– PAP method), total cholesterol: (enzymatic CHOD–PAP method) and LDL and HDL using enzymatic methods].

STATISTICAL ANALYSIS

Data were analyzed using SPSS version 16 and presented as mean ± SD. P value < 0.05 was considered significant.

RESULTS

Cholesterol

The mean total cholesterol in the patients and control group were (145 mg/dl ±47) and (162 mg/dl ±12) respectively. Results showed a significant decrease in the patients mean when compared to that of the control (P = 0.02) see table (1).

Triglycerides

The mean triglyceride in the patients and control group were (100 mg/dl ± 60) and (115 mg/dl ±22) respectively. Results showed no significant difference between the patients mean and that of the control (P = 0.15)see table(1).

HDL

The mean HDL in the patients and control group were (31 mg/dl ±7) and (70 mg/dl ±5) respectively. Results showed a significant decrease in the patients mean when compared to that of the control (P = 0.00) see table (1).

LDL

The mean LDL in the patients and control group were (93 mg/dl ±38) and (69 mg/dl ±11) respectively. Results showed a significant increase in the patients mean when compared to that of the control (P = 0.00) see table (1).

Table-1: The mean, S D of the parameters for the patients (P) and control (C) and the significance of the difference between them

	Group	Mean	S D	Sig
T. CHOL (mg /dl)	P	145	47	.024
	C	162	12	
TG (mg /dl)	P	100	60	.150
	C	115	22	
HDL_C (mg /dl)	P	31	7	.000
	C	70	6	
LDL_C (mg /dl)	P	93	38	.000
	C	69	12	

Table-2: correlation between the different parameters of the patients

		Duration	T. CHOL	TG	HDLC	LDLC
Duration In Years	P Correlation	1	.118	-.133	.240	.139
	Sig. (2-tailed)		.470	.414	.136	.391
T. CHOl in mg/dL	P Correlation	.118	1	.545**	.387*	.951**
	Sig. (2-tailed)	.470		.000	.014	.000
TG in mg/dL	P Correlation	-.133	.545**	1	.185	.311
	Sig. (2-tailed)	.414	.000		.253	.051
HDLc in mg/dL	P Correlation	.240	.387*	.185	1	.213
	Sig. (2-tailed)	.136	.014	.253		.186
LDLc in mg/dL	P Correlation	.139	.951**	.311	.213	1
	Sig. (2-tailed)	.391	.000	.051	.186	
**. Correlation Is Significant At The 0.01 Level (2-Tailed). *. Correlation Is Significant At The 0.05 Level (2-Tailed).						

DISCUSSION

Our study showed that there was a significant decrease in the patients total cholesterol (145 mg/dl ± 47) compared with that of the control group (162 mg/dl ± 46) (p. value = 0.02). Total cholesterol showed a small positive correlation with the duration of the disease (p =0.4) (r = 0.11). Although the level was normal, the correlation showed that there was an effect of the disease duration on the level of the cholesterol. Here we disagree with studies by Sungchl seo *et al*. [10] and Ji Hyun LEE *et al*. [11] who found no difference in the total cholesterol when comparing between AD patients and non-AD controls .

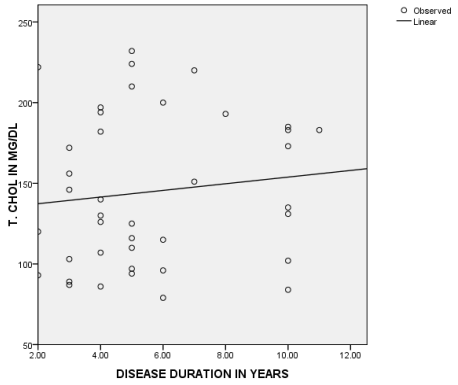

Fig-1: showed positive correlation between cholesterol and duration of AD

In this study, when comparing triglycerides between atopic dermatitis patients and controls, there were no significant differences (P = 0.15) and there was small negative correlation between duration of the disease and triglycerides (r = -0.13, P = 0.4). This is in agreement with study by Sung chul *et al.* [10].

The significant decrease in the HDL of the patients (mean = 31 mg/dl ±7) when compared with that of the control group (mean = 69 mg/dl ± 5, P = 0.00) and there was a small positive correlation between duration of disease and HDL (r = 0.2, P =0.1), the observed results agreement with Dr. Enza D'Auria *et al.* who found that; serum HDL was lower in children with atopic dermatitis than controls[6].

The significant increase in the patients LDL (93 mg/dl ±38) when compared with the control group (69 mg/dl ±11, P. =0.00) and its small positive correlation with duration of the disease (P. value = 0.3)(r = 0.13) , is in agreement with studies by Dr. Enza D'Auria and *et al*.[6].

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CONCLUSION

Sera of Sudanese patients with atopic dermatitis showed a significant higher level of LDL, lower level of HDL and total cholesterol and no changed in triglyceride level when compared with non-atopic dermatitis controls.

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