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RESEARCH ARTICLE

INFLUENCE OF TYPE AND DURATION OF PSORIASIS ON SERUM TOTAL CHOLESTEROL IN SUDANESE PATIENTS ATTENDING KHARTOUM TEACHING HOSPITAL FOR DERMATOLOGY AND VENEREAL DISEASES

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ABSTRACT

Background: Psoriasis is an inflammatory dermatosis that is characterized with excessive cellular replication. The high prevalence of atherosclerosis has been reported in psoriatic patients. High serum lipid level has been suggested in the pathogenesis of this phenomenon.

Aims: To evaluate the influence of the type and the duration of psoriasis on serum total cholesterol level.

Materials and Methods: the study involved a group of psoriatic patients (N = 79), which were classified into five types of psoriasis. The age range of groups was 18-66 years. Serum cholesterol, concentrations were measured according to the standards. Appropriate statistical tests were used to assess significant difference in the means of the studied concentrations between groups of patients.

Results: The highest cholesterol concentration was observed in psoriatic arthritis (M±SD = 244.3±70 mg/dl), while other types of psoriasis Erythrodermic, Guttate, Plaque, and Inverse shows (M±SD = 243.7±80, 203±34, 190±40, and 192±42 mg/dl, respectively), there was significant positive correlation between the duration of psoriasis and cholesterol concentrations (CC = 0.391, P = 0.001).

Conclusion: This study shows that the highest concentration of serum cholesterol is in psoriatic arthritis, and there is a positive correlation between duration and serum cholesterol concentration.

INTRODUCTION:

Psoriasis is an autoimmune chronic inflammatory disease of the skin [(1)], scalp, nails, and sometimes joints [(2)], that affects 1-2 percent of the general population [(3)]. Psoriasis typically first affects patients between the ages of 15 and 35 and can cause major physical and psychological morbidity, leading to a significant economic burden on the health care system and the patient [(4-6)]. Psoriasis was originally thought of as an inflammatory disorder solely affecting the skin, but it is now recognized as a systemic inflammatory disease, much like systemic lupus erythematosus (SLE) and rheumatoid arthritis (RA) [(5)]. Research suggests that patients with chronic systemic inflammatory diseases like SLE, RA, and psoriasis are at increased risk for atherosclerosis and heart disease [(7-9)]. With new evidence supporting the inflammatory basis for atherosclerosis and coronary artery disease (CAD), researchers hypothesize that systemic inflammation may be one potential mechanism linking chronic inflammatory diseases to atherosclerosis and heart disease [(10)]. Not surprisingly then, recent observational studies show an increased risk of cardiovascular disease in patients with psoriasis [(11;12)].Psoriasis has been associated with an abnormal plasma lipid metabolism and diabetes possibly related to alterations in insulin secretion and sensitivity [(13)]. There is also increased oxidative stress with high frequency of cardiovascular events.

High prevalence of cardiovascular events is related to severity of psoriasis [(14)]. The duration of disease and its severity are related to the incidence of cardiovascular diseases, such as myocardial infarction, coronary artery disease and stroke. In psoriatic patients, lipid abnormalities are correlated with increased mortality due to myocardial infarction and stroke [(15;16)].

To our knowledge no study was done in Sudan to evaluate the effect of duration and type of psoriasis on serum lipids.

PATIENTS AND METHODS:

A total of 44 consecutive male and 35 female patients with psoriasis were enrolled. Similar number of non-psoriatic patients i.e. 44 male and 35 female with matching ages were included as controls. All patients age was more than 18 years of either gender and with various grades of severity were included in study.

An informed consent was signed by them. The

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data was entered into a pre-structured standard proforma. Long history of alcohol intake, smoking, hypertension, diabetes, BMI > 30kg/m^2 or with personal or family history of metabolic disease, patients taking drugs known to affect lipid or carbohydrate metabolism such as beta blockers, thiazides, corticosteroids, cyclosporine, retinoids and lipid lowering drugs were also excluded. Similarly female pregnant patients or those taking oral contraceptive for at least 6 months or women in their menopausal stage were excluded from study. A detailed physical examination was conducted to note the sites, degree of erythema, thickness of plaques and amount of scaling over plaques. Psoriasis area and Severity Index (PASI score) was generated for each patient to gauge the severity of psoriasis.

A thorough systemic examination was conducted every time by the same qualified physician to exclude systemic disease that would act as a confounding variable.After fasting of 14 hours, 5 ml of venous blood was drawn in sterile syringe and submitted to the laboratory for estimation of total cholesterol by BioSystems A25 chemistry analyzer using BioSystems kit (Spain).

STATISTICAL ANALYSIS:

The data was analyzed using SPSS software version 17.0. The student t test was applied to compare the means (2- tailed) among continuous parameters at 95% confidence interval. Correlations between serum TC and the duration of psoriasis were assessed using bivariate correlations. $P < 0.05$ was considered statistically significant.

RESULTS:

The study included a total of 158 patients. Among them 79 had psoriasis (44 male and 35 female) and 79 were healthy controls (44 male and 35 female). Their ages ranged from 18 to 68 years with a mean of 37 ± 7.96 years. All had psoriatic lesions that involved less than 30% of body surface. Family history of psoriasis was positive in 10 (6.32%) patients. The majority of patients n= 52 (65%) had plaque type psoriasis, 19 (23.8%) had erythrodermic psoriasis, 05 (6.3%) had guttate lesions, the remained 04 (5.0%) comprised of inverse and psoriatic artheritis. The duration of disease ranged between 18 months to 10 years with a mean of 4.5±1.89 years.The highest concentration of cholesterol was observed in psoriatic arthritis (M±SD= 244.3±70), followed by erythrodermic types (M±SD= 243.7±80), while the lowest concentrations was seen in plaque type of psoriasis (M±SD= 190±70), summary of distribution of serum cholesterol according to the type of psoriasis was shown in figure 1. Total cholesterol concentrations correlates positively with the duration of psoriasis (CC = 0.391, $P = 0.001$).

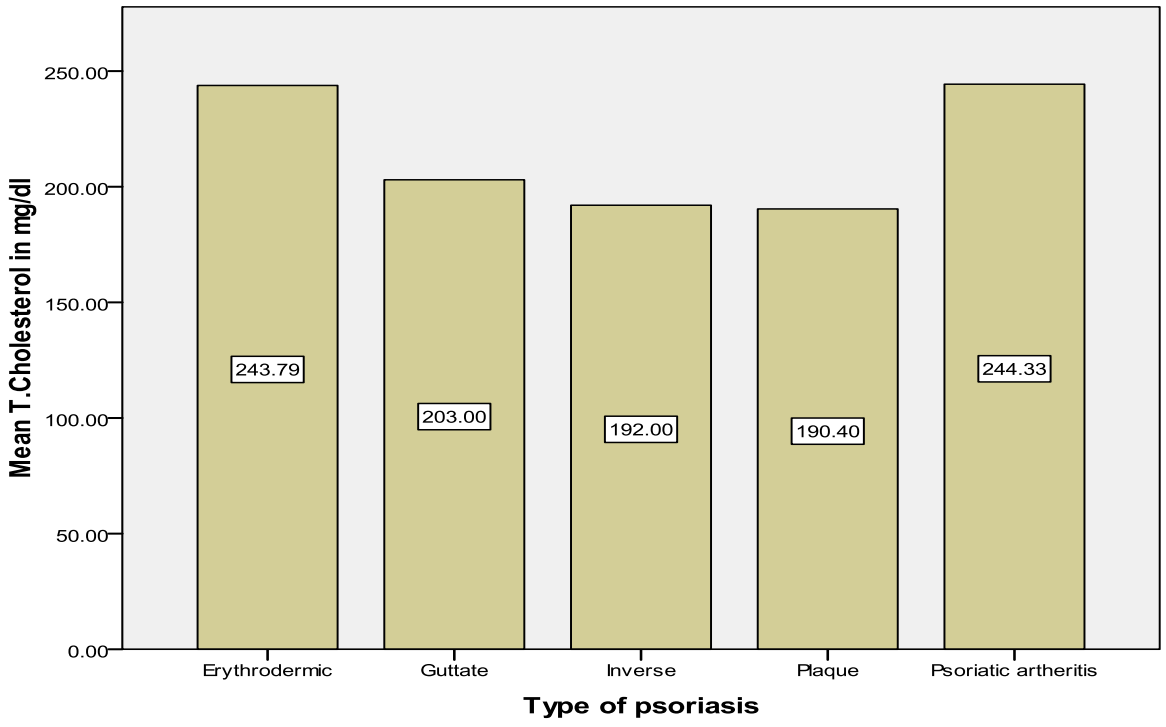

Figure 1: Total cholesterol concentrations correlates positively with the duration of psoriasis (CC = 0.391, *P* = 0.001).

DISCUSSION:

There has been much interest in determining lipid abnormalities and other risk factors for atherosclerosis in psoriatic patients. Lea WA et al., (1958) were the first to report increased serum lipids in patients with psoriasis about 50 years ago [17]. Since then many studies have been done on this subject which consistently report a raised prevalence of lipid abnormalities in psoriasis [7;18]. There is increased prevalence of coronary artery disease in our population [19]. The predisposition to vascular occlusive events in psoriasis and psoriatic arthritis has increased possibly because of raised plasma lipids and other inflammatory mediators [10]. Therefore it is prudent to know and prevent these co-morbid conditions in psoriasis.

There are controversial results about serum cholesterol levels in psoriasis; Some reported high results [20], others reported low results, and some even normal levels [21]. In the present study the cholesterol levels were significantly higher in patients as compared to control.

Results of the studies present a decrease of cholesterol and phospholipids levels connected with HDL fraction independently of psoriasis severity and duration [22]. In the present study there was a positive correlation between duration of the disease and TC levels. Various biochemical disturbances can occur in psoriasis, such as abnormalities of receptor function, changes of hepatic structure and function, activity and changes of hepatocyte membranes [22].

The duration of disease and its severity are related to the incidence of cardiovascular diseases, such as myocardial infarction, coronary artery disease and stroke. In psoriatic patients, lipid abnormalities are correlated with increased mortality due to myocardial infarction and stroke [8;23].

Generally all types of psoriasis are associated with abnormal plasma lipids, although, from this present study, the predominant type of psoriasis in Sudan in plaque type of psoriasis, this type associated with the lowest concentration of TC compared with the other types.

In the present study, males were found to have greater abnormalities in serum TC as compared to females. This may be because the majority of female patients were younger as compared to males and had not reached their menopause.

The reasons for dyslipidaemia in psoriasis may be multiple. The structural and functional changes in digestive tract [24], immune mechanisms involving IL-6، tumour necrosis factor, C-reactive proteins، and cellular oxidative stress may be responsible for altered lipid metabolism [25].

CONCLUSION:

In conclusion TC concentrations positively correlate with the duration of the disease, and although the predominant type of psoriasis in Sudan is plaque type, the highest levels of TC were seen in patients with psoriatic arthritis.

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