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Original Article

A comparison study of lipid profile levels between skin tags affected people and normal population in Tehran, Iran

Abbas Rasi[1], Alireza Faghihi[2], Yaser Rahmanzadeh[1], Habib Hassannejad[1]

[1]Skin and Stem Cell Research Center, Department of Dermatology, Tehran University of Medical Sciences, Tehran, Iran, Department of Dermatology, Rasoul-e Akram Hospital, Iran University of Medical Sciences, Tehran, Iran, [2]Skin Diseases and Leishmaniasis Research Center, Department of Dermatology, Isfahan University of Medical Sciences, Isfahan, Iran, Department of Dermatology, Rasoul-e Akram Hospital, Iran University of Medical Sciences, Tehran, Iran

Abstract

Background: For many years the association of skin tags and endocrynopathies has been postulated, although many reports are available but it has never been evaluated to mean normal population. Dyslipidemia is a frequent disorder among people and seemed to be necessary for screening within skin tag condition. This study is designed to find any possible association between skin tags and dyslipidemia.

Materials and Methods: From April 2009 to June 2011, 168 patients enrolled the study. Among the remaining 152 patients, there were 89 females (58.5%) and 63 males (%41.5). Based on the TLGS study 136 men and 220 women enrolled the control group of study. The mean age was 28.4 years. Patients trained to have normal free diet for at least 1 month then referred to the laboratory. Blood samples were taken over 12 hours fasting with 2 hours intervals. Hypertriglyceridemia was defined as plasma level ≥160 mg/dl for men and ≥130 mg/dl for women. Hypercholesterolemia pointed at its value >200 mg/dl. Normal HDL levels was defined as >39 mg/dl for men and >35 mg/dl to women.

Results: Mean skin tag number was 12.6 per subject. The most frequent localizations of skin tags were neck and upper chest (mean number: 13.4, 48.9%) followed by axilla (mean number: 11.6, 33%) and breast (10.2, 10.1%) in the patient group. The mean cholesterol level of case group was 192.2 ± 33.1 mg/dl, while it was 187.0 ± 42 mg/dl in the control group). The mean ± SD for triglyceride was 132.1 ± 69 mg/dl in comparison to 129 ± 74 in the control group.

Conclusion: The study showed no significant differences between normal population and patients' lipid profile.

Key Words: Dyslipidemia, lipid profile, lipid profile levels, skin tags

Address for correspondence:
Dr. Alireza Faghihi, Skin Diseases and Leishmaniasis Research Center, Isfahan University of Medical Sciences, Isfahan, Iran. E-mail: Faghihi.ali@gmail.com
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INTRODUCTION

The presence of skin tags over the body is a usual finding through physical examination. They present as a small skin colored to dark brown sessile or pedunculated papilloma, often on the neck and upper chest, also frequently in axilla and over eyelids, less often on the body surface. These flesh-colored

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tear-drop shaped tags, feel like small bags. Based on twisted pedicle, they become inflamed, tender and even gangrenous. Both sexes are affected equally. A potential association was suggested between many conditions, especially metabolic abnormalities. Nearly 60% of individuals acquire them by the age of 69. Increasing number of lesions was reported with weight gain and pregnancy. They may be related to growth hormone like activity of insulin.[1-9]

Conditions like lipid profile abnormality, hypertension, hyperglycemia, hyperinsulinemia, hyperleptinemia and insulin resistance are assumed to be related. Metabolic abnormalities such as hypercholesterolemia and insulin resistance are well-known risk factors of atherosclerosis and cardiovascular disease. Also, the presence of skin tag in association with different systemic disorders like acromegaly, colonic polyps, and Birt-Hogg-Dube syndrome and in children with nevoid basal cell carcinoma syndrome as a presenting sign was reported.[10-15]

Although many disorders are considered to be accompanied by skin tags, to date no sufficient studies have been conducted to assay real risk. This survey was designed as a cross-sectional study to evaluate the risk of dyslipidemia in people with skin tags versus normal population in Tehran.

MATERIALS AND METHODS

Case group

Cases were recruited from patients over 18 years old, sequentially visited at dermatology clinic of Rasul-e-Akram University Hospital, Tehran, Iran, from April 2009 to June 2011. Details of the study were explained to patients and informed written consent was also obtained from subjects who agreed to participate. The study was approved by the research ethics committee of the university. The cases were examined by a resident and two trained dermatologists.

Skin tag was defined as a furrowed pedunculated skin-colored papule approximately 2 mm in width and 3-6 mm in height, with duration of lesions for at least 6 months. A minimal number of 3 lesions was pointed to be enrolled of the study.

Exclusion criteria were designed as follows.

1. Secondary disease with possible alternating lipid profile such as diabetes mellitus, gastroentropathy, malabsorbtive disorders, hepatic disease
2. Endocrinopathies like Cushing syndrome, thyroid dysfunction
3. Interventional medicine affecting lipid profile as statins.

Control group

Controls were enrolled in the study from Tehran Lipid and Glucose Study (TLGS). This study was conducted within the framework of the TLGS, a population-based study, conducted on a representative sample of residents of district-13 of Tehran, with the aim of determining the prevalence of no communicable disease risk factors and developing a healthy lifestyle to improve these risk factors. The study is divided into two phases: A cross-sectional study of the prevalence of cardiovascular disease and its associated risk factors, and a prospective 20-year follow-up study.[16] In the TLGS, of 15 005 individuals, aged 3 years and above, living in district-13 of Tehran, selected by multistage cluster random sampling methods, 10 368 subjects (4397 men and 5971 women), aged 20 years, were evaluated in the cross-sectional phase 1 o f TLGS from 1999 to 2001; those were excluded who were having a history o f significant hepatic, renal or thyroid dysfunction, acute or chronic inflammatory diseases, recent surgical operations, myocardial infarction, or a cerebrovascular accident with in the previous 3 months, corticosteroid medication, pregnancy.

Laboratory examinations were performed for cases in Rasul-e-Akram referral laboratory. The patients were visited and followed by two well-trained dermatologists and a resident of dermatology, all over the study period. Physical examination, full medical history and anthropometric measurements were also created. Overweight was defined as BMI ≥25 and obesity as BMI ≥30. Number and anatomical location of skin tags were noted. Any personal and familial histories of hypertriglyceridemia, hypercholesterolemia, and history of familial skin tags and age of onset of skin tags were recorded.

Patients trained to have normal free diet for at least 1 month, and then referred to the laboratory. Blood samples were taken over 12 hours fasting and at a period of 2 hours wakening. Hypertriglyceridemia was defined as plasma level ≥160 mg/dl for men and ≥130 mg/dl for women. Hypercholesterolemia pointed at its value >200 mg/dl. Normal HDL level was defined as >39 mg/dl for men and >35 mg/dl for women.

The sample size of the study was calculated to warrant a power of 80% to detect significant difference between two groups, so 152 patients were enrolled in the case group.

We used SPSS software version 17.5 (SPSS Inc., Chicago, IL USA) to mean of detection and comparison of possible differences. T-test and test/Fischer exact test were used to determine any probable differences.

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T-test was used to determine the probable significant difference of fasting plasma lipid levels.T -test was used for hypertriglyceridemia and hypercholesterolemia.

Pearson correlation analysis was used for evaluation of relationships of skin tags number and any lipid profile levels and BMI. A $P < 0.05$ was considered significant.

RESULTS

From April 2009 to June 2011, 168 patients enrolled the study. Sixteen patients were lost to follow-up for reasons unrelated to the study. Among the remaining 152 patients, there were 89 females (58.5%) and 63 males (%41.5). The age ranged between 18 and 73 years (mean age, 49.6 years).

Based on the TLGS study, 136 men and 220 women enrolled the control group of the study. The mean age was 28.4 years. No clinically significant differences were found in demographic variables between cases and control group.

Mean skin tag number was 12.6 per subject. In 56 patients (36.8%), skin tag number was low (<10). In 75 subjects (51.9%) it was moderate (between 10 to 30) and finally in 17 patients (11.1%), total body skin tags number was high (≥30). Statistical analysis showed no significant differences between skin tag number and hypertriglyceridemia or hypercholesterolemia [Table 1].

The most frequent localizations of skin tags were neck and upper chest (mean number: 13.4, 48.9%) followed by axilla (mean number: 11.6, 33%) and breast (10.2, 10.1%) in the patient group. Also, no significant difference was found between gender, age, and number of lesions ($P = 0.078$ and $P = 0.066$ respectively). Family history was positive in 58 patients (38.1%) [Table 2].

The mean cholesterol level of the case group was 192.2 ± 33.1 mg/dl, while it was 187.0 ± 42 mg/dl in the control group. There were no significant differences between these groups ($P = 0.099$). The mean ± SD for triglyceride was 132.1 ± 69 mg/dl in comparison to 129 ± 74 in the control group. No significant difference was found statistically ($P = 0.064$). The mean ± SD for LDL was123 ± 41 mg/dl in comparison to 117 ± 39 in the control group ($P = 0.096$). The mean ± SD for HDL was 41.1 ± 9.3 mg/dl in comparison to 44.8 ± 10.8 in the control group ($P = 0.078$). Although we didn't observe any significant difference for serum HDL and LDL levels between case and control groups ($P = 0.056$). Table 1 shows the concentrations of serum lipids in patients and controls. The mean BMI was 28.8 ± 7.1 (men = 27.1 and women = 30.1). The mean BMI of the case group was 28.8 ± 7.1, while it was 22.3 ± 5.8 in the control group. This value had significant differences in between these groups ($P = 0.003$) [Tables 3 and 4].

Table 1: Skin tags frequency based on anatomical location

Affected site	Frequency (%)
Upper chest/neck	13.49 (48.9)
Axilla breast	11.6 (33)
	10.2 (10.1)

Table 2: Antropometric measures and mean skin tag number based on gender

Gender	Mean age (years)	BMI	Skin tags number
Female	47.8	30.1	14.4
Male	52.1	27.1	10.05

BMI: Body mass index

DISCUSSION

Among many studies on plasma lipid concentration in patients with skin tag, conflicting results have been reported. According to previous studies, a significant association between obesity, hypertension and diabetes and skin tags has been found and they hypothesized that patients with skin tags are predisposed to increased rates of concurrent atherosclerotic events specially CVD. The present study was undertaken to further characterize the lipid profiles in Iranian patients who had skin tags.

In the Galardi I and Rajab H study, most frequent sites of skin tags were neck and other flexural areas.[17] In another study,[18] the most common site of skin tags were neck and axilla. In our study, the most frequent localization of skin tags was neck and upper chest, followed by axilla and breast

Table 3: Comparisons of skin tag number versus gender, hypertriglyceridemia, hypercholesterolemia and age, using the *t*-test method

Variable	Gender	Hypertriglyceridemia	Hypercholesterolemia	Age
Skin tag number (*P* value)	0.078	0.064	0.099	0.066

Table 4: Comparisons of HDL, LDL, triglyceride, cholesterol and BMI value between case and control groups using the *t* test method

Variable	Cases	Controls	*P* value
LDL level	123±41	117±39	0.096
HDL level	41.9±9.3	44.8±10.8	0.078
Triglyceride level	132.1±69.6	129±74	0.064
Cholesterol level	192.2±33.1	187±42	0.099
BMI	28.8±7.1	22.3±5.8	0.003

BMI: Body mass index, LDL: Low-density lipoprotein, HDL: High-density lipoprotein

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in the patient group. In Gorpelioglu *et al*. study, 58 patients with at least 3 skin tags studied versus 31 healthy controls. They illustrated significant higher levels of total cholesterol and LDL when compared with healthy control groups but no difference for BMI, HbA1c, triglyceride, HDL and leptin.[19] Moreover, Crook noted a atherogenic lipid profile, increased serum triglyceride concentration and decreased HDL cholesterol in a small study group including four patients with skin tags.[1] In Erdogan *et al*. study, 26 patients were enrolled to study. BMI, HOMA-IR and total cholesterol were significantly higher.[20] In another study, Sari *et al*. also demonstrated 113 patients with skin tags and found that the frequency of dyslipidemia was 59.3% in the patient group.[21] In the[18] study, the mean levels of BMI, total cholesterol, LDL, cholesterol, triglyceride, AST, ALT, GGT, and ALP were significantly higher in patients than those in controls. Nevertheless, the mean levels of HDL cholesterol were lower in patients. We didn't detect higher cholesterol, triglyceride, LDL, and lower HDL in patients with skin tags.

In addition, Demir and Demir *et al*. found positive correlation between the number of skin tags and BMI.[22] In another study,[21] a positive correlation between BMI and leptin was found. In another study,[3,4] skin tag was found in up to 74% of patients, and their prevalence correlated positively with the severity of the obesity. Similarly, 53.9% and 33.6% of patients with skin tags were overweight and obese. We did not found any correlation between number of skin tags and BMI.

Hyperinsulinemia is suspected to be the stem of the theory of impair carbohydrate metabolism and possible metabolic syndrome which seems to be essential in dyslipidemia.[10,11] As mentioned above, we excluded any possible confounder factor like diabetes mellitus in selecting case group. By omitting cases with diabetes, the role of hyperinsulinemia in major cases (not all) was excluded. It is postulated that skin tags are the result of proliferation of dermal fibroblast via activation of IGF-1 receptors acting in certain areas of skin folds, neck, axilla, groins, and lids.

CONCLUSION

The results reported by us are slightly different and do not support several previous studies. Interestingly, our study showed that, skin tags more likely may not be the cutaneous marker for underlying dyslipidemia, atherosclerosis and cardiovascular disease in Iranian patients. Thus, based on these findings, the linkage between skin tags and these factors is a place of discussion, so we do not recommend routine evaluation of lipid profile or liver enzymes in patients with skin tags at presentation and during the follow-up period. However, further studies on much larger groups of patients and repeated measurement of the lipids at different times would be valuable for the final conclusion.

Our study had some limitations. Serum levels of lipids may be affected by various endogen and exogenous factors such as oxidative stress, inappropriate dietary habits and decreased physical activity. We could not compare these factors in our analysis.

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