ejpmr, 2025, 12(4), 94-97

SJIF Impact Factor 7.065

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

EVALUATION OF SERUM LIPIDS LEVELS IN PATIENTS WITH SKIN TAGS

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Article Received on 13/02/2025 **Article Revised on 05/03/2025** **Article Accepted on 25/03/2025**

ABSTRACT

Study Aim: To investigate the relationship between skin tags and high serum lipids, and to analyze how dyslipidemia severity correlates with the number of skin tags, patient age, and body mass index (BMI). **Material and Methods:** After obtaining informed consent, a comprehensive history was recorded for all participants, including age, weight, and height for BMI calculation, along with the number and location of skin tags. Current and previous medications were noted along with medical history and latent risk factors. Following a fasting period of at least 12 h, 5 ml of venous blood was drawn for various tests, including serum cholesterol, triglycerides, high-density lipoprotein (HDL), and low-density lipoprotein (LDL). Serum lipid levels were compared between the case and control groups, and the results were analyzed for correlation with skin tag count, patient age, and BMI. **Results:** The study sample comprised 150 individuals, with 75 cases of skin tags and 75 controls. The average age for the case group was 42.19 ± 12.7 years, while the control group averaged 39.76 ± 12.3 years. In the case group, 36 males (48%) and 39 females (52%) were observed; in the control group, there were 35 males (46.7%) and 40 females (53.3%). The BMI in the case group was 28.65 ± 5.81 kg/m², compared to 24.68 ± 5.04 kg/m² in the control group. Skin tag counts ranged from 1 to 83, with an average of 17.97 ± 11 tags, predominantly located on the eyelids (40 cases, 53.3%). The mean total cholesterol (TC) in the case group was 222.71 ± 40.9 mg/dL, total triglycerides 190.8 ± 67.3 mg/dL, LDL 143.93 ± 46.15 mg/dL, and HDL 40.91 ± 16.5 mg/dL. In the control group, mean total cholesterol was 187.94 ± 34.8 mg/dL, triglycerides 138.11 ± 41.4 mg/dL, LDL 131.8 ± 29.7 mg/dL, and HDL 45.3 ± 18 mg/dL. **Conclusion:** Dyslipidemia, characterized by elevated total cholesterol, triglycerides, and LDL levels, correlates with an increased presence of skin tags, suggesting a potential indication of dyslipidemia. An increased number of skin tags may reflect higher total serum cholesterol and triglyceride levels.

KEYWORD:- Skin growths, total cholesterol, triglycerides, low-density lipoprotein, high-density lipoprotein.

INTRODUCTION

Skin tags, also known as (Acrochordon), are soft growths on the skin that are classified as benign tumors commonly observed in adults, particularly those who are obese.[1-2]

These formations typically appear in the skin folds, including the neck, armpits, eyelids, and groins.[3-4] While most skin tags are asymptomatic, they can become symptomatic when inflammation occurs, particularly if the pedicle becomes twisted or sensitive.[5-6] Both sexes are equally affected by skin tags.[1]

The exact pathogenesis of skin tags remains unclear; however, certain risk factors have been identified to potentially increase their incidence. These factors include family history, pregnancy, type 2 diabetes, obesity, dyslipidemia, and elevated blood leptin levels.[7-8-9]

Numerous studies have suggested a strong correlation between serum lipid levels and the development of skin tags, as heightened lipid levels can increase leptin levels, which play a role in appetite regulation, energy expenditure, and fat and carbohydrate metabolism.[10-11]

Leptin may facilitate the formation of skin tags by promoting differentiation and proliferation of keratinocytes and fibroblasts in the epidermis and dermis.[12-13-14]

Because of the differences in the studies, some of which denied the existence of a relationship between skin tags, we conducted this research to study the relationship between skin tags and serum lipid levels.

METHODS AND MATERIALS

Upon obtaining informed consent, a comprehensive history was collected from participants, including age,

weight, height (to calculate BMI), number and location of skin tags, present and past treatments, and medical history of potential risk factors. Following a 12-hour fasting period,[15] 5 ml of venous blood was drawn for analysis as follows:

1. Serum cholesterol levels
2. Triglycerides
3. High-density lipoprotein (HDL)
4. Low-density lipoprotein (LDL)

A comparative analysis was performed on serum lipid levels between the case and control groups, along with an investigation of the relationship between lipid levels, skin tag count, patient age, and BMI within the case group.

The data were processed using SPSS v26 for statistical analysis.

RESULTS

The study sample comprised 150 individuals, split equally between 75 cases with skin tags and a control group of 75 healthy individuals. Participants' ages ranged from 20 to 66 years, with a mean age of 40.97 ± 12.5 years. The mean age in the case group was 42.19 ± 12.7 years, compared to 39.76 ± 12.3 years in the control group. The Kolmogorov-Smirnov test indicated p=0.079, suggesting homogeneity in age distribution. (Table 1)

In terms of gender distribution, the sample included 71 males (47.3%) and 79 females (52.7%). The case group comprised 36 males (48%) and 39 females (52%), while the control group comprised 35 males (46.7%) and 40 females (53.3%). The Kolmogorov-Smirnov test for sex distribution yielded p=0.29, confirming a normal and homogeneous distribution. (Table 1)

The BMI values in the study sample ranged from 19.32 to 42.24 kg/m², with an arithmetic mean of 26.35±5.36 kg/m². The case group exhibited a BMI of 28.65±5.81 kg/m², while the control group had a BMI of 24.68±5.04 kg/m². (Table 1)

Table 1: Demographic characteristics of sample individuals.

Variable		Cases Group	Control Group	P-value
Age (year)		42.19	39.76	0.079
Gender	Male (n)	36	35	0.29
	Female (n)	40	39	
BMI (Kg/m^2)		28.65	24.68	0.043

The number of skin tags varied between 1 and 83, with an average of 17.97±11 skin tags. Most individuals in the case group had a low number of skin tags (< 10) at a rate of 48% (36 cases), followed by those with a moderate number of tags (10-30) at (30.7%) (23 cases), and those with a high number of tags (≥ 30) at 21.3% (16 cases). (Table 2)

Table 2: Number of skin tags among cases group.

Skin Tag number	Patients (n)
Less than 10	36
Between 10-30	23
More than 30	16

The most prevalent location for skin tags was the eyelids, present in 40 cases (53.3%), followed by the neck and upper chest area in 32 cases (42.7%), the armpit in 31 cases (41.3%), and other areas in 15 cases (20%). The arithmetic mean of total cholesterol (TC) in the case group was 222.71±40.9 mg/dL, while total triglyceride levels were 190.8±67.3 mg/dL, LDL levels were 143.93±46.15 mg/dL, and HDL levels were 40.91±16.5 mg/dL. In the control group, the mean total cholesterol value was 187.94±34.8 mg/dL, total triglycerides were 138.11±41.4 mg/dL, LDL was 131.8±29.7 mg/dL, and HDL was 45.3±18 mg/dL. The P values in (Table 3) are statistically significant for the differences in total cholesterol, total triglycerides, and LDL values between the case and control groups; however, the differences in HDL values were not statistically significant.

Table 3: Comparison of lipid profile among sample (Cases vs control group).

Variable	Cases Group	Control Group	P-value
TC (mg/dl)	222.71	187.94	0.001
TG (mg/dl)	190.8	138.11	0.001
LDL (mg/dl)	143.93	131.8	0.037
HDL (mg/dl)	40.91	45.3	0.061

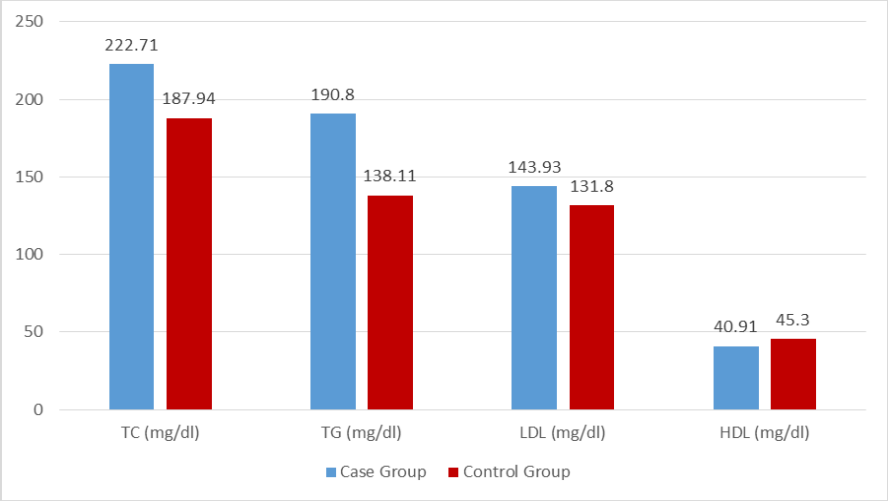

Figure 1: Demonstrating lipid profile among sample individuals (Cases vs control group).

Our study observed an increase in the number of skin tags among the elderly, although this was not statistically significant, nor was there an observed association between high BMI and an increased number of skin tags. (Table 4) Disturbances in the levels of total cholesterol and triglycerides were significantly associated with an increase in the number of skin tags ($P=0.025<0.05$, $0.004<0.05$). Conversely, no significant relationship was observed between the LDL and HDL levels and the number of skin tags. (Table 4)

Table 4: The relationship between age, BMI, lipid profile and skin tag number.

Variable	Skin Tag Number			P-value
	<10	10-30	>30	
Age (year)	40.61	41.35	46.9	0.057
BMI (Kg/m^2)	25.93	27.25	28.9	0.91
TC (mg/dl)	216.06	221.75	227.39	0.025
TG (mg/dl)	171.26	187.69	204.67	0.004
LDL (mg/dl)	140.74	136.75	149.17	0.51
HDL (mg/dl)	44.17	36.91	39.11	0.23

DISCUSSION

Skin tags are among the most common benign tumors affecting the skin. Although they are benign and asymptomatic, they can signify various underlying conditions including dyslipidemia and other related pathologies.

The most common age of onset was 42.19 year, indicating late adulthood. The incidence was similar between males and females, although a slightly higher incidence was observed in women. Previous studies by **Rasi**,[16] **Khairani**,[17] and **Kurniawati**[18] indicated a higher incidence in females, while **Idris**[12] and **Thappa**[19] reported a higher incidence in males.

Skin tags have been associated with a higher BMI, which is a statistically significant relationship. Our study identified an association between dyslipidemia (total cholesterol, triglycerides, and LDL) and the incidence of skin tags, consistent with findings from **Lestari**,[20] **Maluki**,[21] and **Khairani**.[17] **Idris** [12] also found that elevated cholesterol levels correlated with an increased incidence of skin tags. This increase may be attributed to the association between high serum lipid levels, obesity, and insulin resistance, which affects leptin levels. Elevated serum lipid levels increase serum leptin levels, leading to greater proliferation and differentiation of keratinocytes and fibroblasts in the epidermis and dermis.[12-13-14]

Insulin resistance increases circulating insulin levels, which stimulates insulin-like growth factor (IGF-1) and inhibits insulin-like growth factor-binding protein 3, thus affecting the transcription of anti-proliferative genes. Insulin and IGF-1 also promote the growth of epithelial and fibroblast cells, potentially increasing the incidence of skin tags.[22-23]

High levels of cholesterol and triglycerides were significantly correlated with an increased number of skin tags, likely because of increased insulin resistance and elevated leptin levels. One limitation of our study was the inability to measure leptin levels in the sample due to unavailability in the hospital.

CONCLUSIONS

1. Disturbances in serum lipid levels, particularly total cholesterol, total triglycerides, and LDL, are associated with an increased incidence of skin tags,

suggesting that these growths may indicate an underlying dyslipidemia.
2. An increase in the number of skin tags may be correlated with elevated total serum cholesterol and triglyceride levels.

Also we recommend

1. Conduct serum lipid analyses in patients with skin growth, particularly in those with a significant number of tags.
2. Investigate the presence of concomitant diseases such as diabetes or heart disease in patients with skin growth.

ACKNOWLEDGEMENT

The authors have nothing to acknowledge.

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