



ASSOCIATION BETWEEN SKIN TAGS AND INSULIN RESISTANCE IN KHARTOUM STATE

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Article Received on 13/12/2016

Article Revised on 03/01/2017

Article Accepted on 23/01/2017

ABSTRACT

Background: Skin Tags are common benign skin growth found throughout the adult populations seem to be associated with insulin resistance. **Methodology:** Cross sectional descriptive study involving 96 subjects with different ages and genders randomly selected. Patients defined as subjects with at least three Skin Tags in different anatomical locations. Patients were divided into subgroups according to Skin Tags numbers into < 8 and ≥ 8 Skin Tags. Fasting blood glucose (FBG) and fasting insulin level were measured. Insulin resistance was estimated using homeostatic model assessment for insulin resistance index (HOMA-IR). Insulin sensitivity was estimated using Quantitative Insulin Sensitivity Check Index (QUICKI). **Results:** A total of 96 patients; 52.1% (50) were normal and 47.9% (46) were insulin resistance according to HOMA-IR index (normal < 2.5). Association of insulin resistance among subgroups of Skin Tags numbers was significant (p -value < 0.0001) the most frequent locations were face and neck. Positive correlation of Skin Tags numbers with FBG, insulin level and HOMA-IR index were significant (p -value < 0.0001, < 0.0001 and < 0.0001) respectively and negative correlation was found with QUICKI (p -value < 0.0001). FBG >126 mg/dL was associated with Skin Tags subgroups (p -value < 0.0001) and type 2 Diabetes Mellitus have been reported on 15.6% (15) of patients. **Conclusion:** Presence of multiple Skin Tags was associated with insulin resistance and may serve as a marker of type 2 Diabetes Mellitus.

KEYWORDS: Skin Tags, Insulin resistance, HOMA-IR.

INTRODUCTION

Skin Tags (Acrochordons, fibro epithelial polyps) are absolutely benign skin growth that found throughout the adult population, with size differs from 1 mm to 1.5 cm and they may appear singly or as multiple polyps with no sex or race preference.^[1] They appear on the neck and major flexures as small loose suspended fibrous tissue protrusion^[2] are low-cal fibroblastic proliferations seems to be related to hyperinsulinemia, via activation of the insulin-like growth factor (IGF-1) receptors present on their surfaces.^[1,2]

Skin Tags (STs) were reported an easily identifiable sign of insulin resistance and non-insulin-dependent diabetes.^[3,4,5] The presence of multiple Skin Tags were identified to be strongly associated with insulin resistance by many Recent studies^[6,7,8] and one of them identified that glucose/insulin abnormalities were related with presence of eight or more Skin Tags.^[7] They also were reported in obese subjects.^[8]

Insulin resistance (IR) is a metabolic abnormality in which responsiveness to metabolic actions of circulating insulin in the target cells decreased which results in compensatory hyperinsulinemia.^[3] Insulin resistance was

quantified using several direct and indirect methods of different complexity; the simple one is the using FBG and fasting insulin level. The indirect available indexes are homeostatic model assessment for IR (HOMA-IR) which is physiologically based on the balance between hepatic glucose production and insulin secretion.^[9,10,11]

Quantitative Insulin Sensitivity Check index QUICKI is an index of measuring insulin sensitivity or responsiveness of cell to action of insulin.^[11-13] These indexes were validated with the gold standard euglycemic clamp method for quantifying IR.^[9, 11, 13,15]

The main aim of this study was to evaluate the association between Skin Tags and insulin resistance irrespective of Race, DM and Body mass index (BMI).

MATERIALS AND METHODS

A cross-sectional descriptive study was conducted involving 96 subjects with different ages and genders in Khartoum state in the period from February to May (2016). Subjects defined as patients with at least three STs in different anatomical locations. All the patients were asked to sign an informed consent prior to inclusion in the study. Pregnant, patients with Acromegaly,

Insulinoma and Poly Cystic Ovary Syndrome (PCOs) were excluded from this study. STs were evaluated by clinical examination with recording their numbers and locations. The laboratory tests were all performed under controlled condition. Glucose was determined by the enzymatic hexokinase kit (cobas integra400; chemistry analyzer) and insulin level was determined using Electro chemiluminescence immuno-assay (cobas e411; immunoassay analyzer).

HOMA-IR index was calculated using this formula: {fasting plasma insulin ($\mu\text{U/ml}$) x fasting plasma glucose (mmol/L)/22.5} normally < 2.5 .^[9,10,14,16]

QUICKI was calculated using this formula $\{1/[\log \text{FBG} + \log \text{FPI}]\}$ (normal level for healthy 0.389 ± 0.041).^[9,12]

Patients were divided into subgroups according to STs numbers (< 8 and ≥ 8) based on previous study asserted that the laboratory abnormalities associated with presence of 8 and more STs^[7]; to identify the association of insulin resistance among them.

The sample size was calculated and the data were analyzed using SPSS 16.00. Significance level was defined as (p -value < 0.05). □

RESULTS

A total of 96 patients 49 (51%) were males with mean age 49.3 ± 14.5 years and 47 (49%) patients were females with mean age 44.8 ± 14.5 years.

The frequency of insulin resistance (HOMA-IR ≥ 2.5) was found on 47.9% (46) of patients and HOMA-IR indexes < 2.5 were found on 52.1% (50) of patients. **Table 1** show the association of IR among STs Subgroups.

Difference of ages and genders among STs Subgroups (p -value 0.078, 0.183) respectively.

Frequency of different anatomical locations of STs and their significance between HOMA- IR index < 2.5 and ≥ 2.5 shows in **Figure 1**.

The correlation between Skin Tags numbers with FBG, insulin, HOMA-IR and QUICKI show in **Graph 1**.

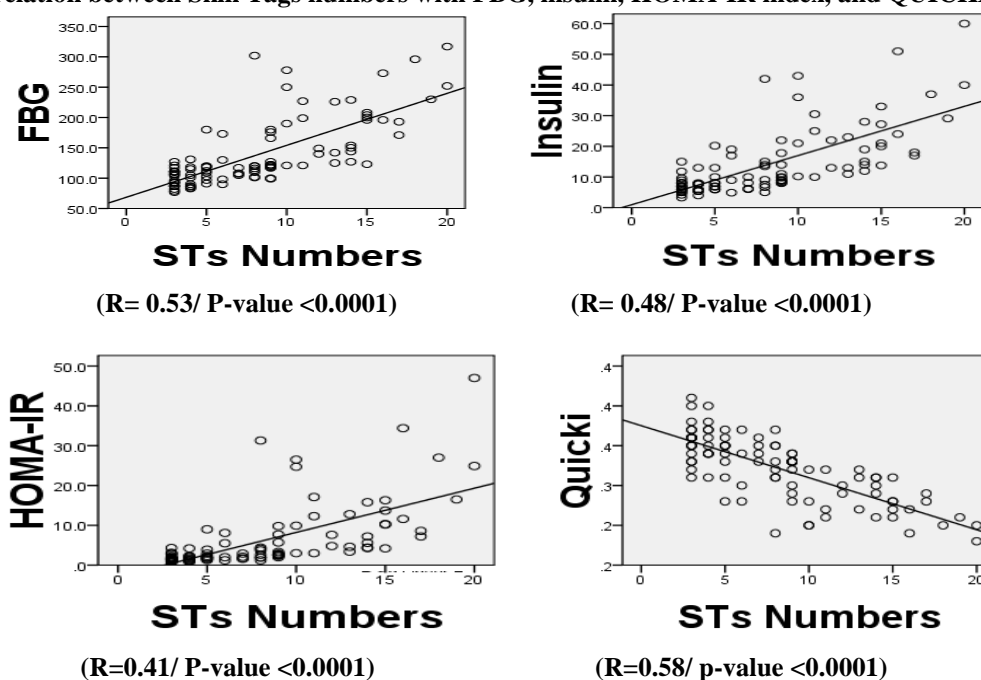
The associations of FBG > 126 mg/dL among STs Subgroups had p -value < 0.0001 among whom 15.6% (15) patients all have been previously diagnosed with type 2 DM.

Table 1: Show the association of IR among STs Subgroups

	HOMA-IR < 2.5	HOMA-IR ≥ 2.5	Total
STs numbers < 8	39	7	46
STs numbers ≥ 8	11	39	50
Total	50	46	96

(Chi square test / P -value < 0.0001).

Graph1: Correlation between Skin Tags numbers with FBG, insulin, HOMA-IR index, and QUICKI:



(Pearson correlation test /scatter dot plot)

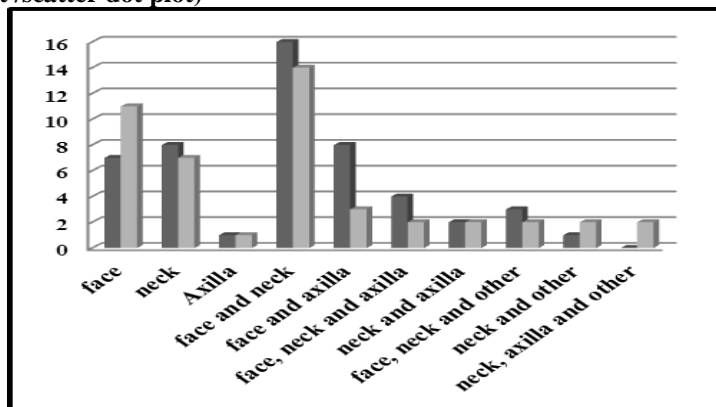


Figure 1: Frequency of different anatomical locations of STs between HOMA- IR index < 2.5 and ≥ 2.5: Normal IR. (Chi square test / P-value 0.698)

DISCUSSION

In this study the significant association of HOMA-IR index among subgroups of STs numbers and the significant positive correlation of Skin Tags numbers with insulin and with HOMA-IR index mean that insulin resistance is associated with the presence of multiple Skin Tags as they was asserted in other studies.^[6,7,8] And these results plus the significant negative correlation with QUICKI assist to explain pathophysiology of their presence, that when IR is present; cell responsiveness to insulin decreased, result in compensatory hyperinsulinemia which promote the growth of these polyps.^[1,2]

There was no significant difference between sub groups with respect to age or gender which exclude them as factors associated with presence of IR in Skin Tags subgroups.

The most frequent anatomical location was face and neck but there was no significant association between different locations of STs and presence of insulin resistance.

With respect to glucose, the significant association of FBG among subgroups of STs numbers and high positively correlation of skin tags numbers with FBG these indicate the presence of skin tags may be a marker of DM. these agree with other previous study.^[4,5] The presence of (15.6%) of patients previously diagnosed with type 2 DM in our study reinforced the concept that STs may be a marker of IR.

The limitations of this study were that it might need to be adjusted for Race, DM & BMI and these are our recommendations.

CONCLUSION

In conclusion of this study: the presence of multiple Skin Tags was associated with insulin resistance and may serve as marker of type 2 DM.

ACKNOWLEDGMENT

I would like to express my deepest gratitude to chemical pathology department, faculty of medical laboratory science university of Khartoum.

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