Acrochordons (skin tags) as a Marker for Insulin Resistance – A case control study from tertiary care centre in South India

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Introduction

Skin Tags (Acrochordons) are fibroepithelial skin tumors. They are acquired benign polyps seen in areas like the neck, axillae, groins (areas of friction), and periorbital region. They are papules that protrude from the skin's surface and can present singly or as multiple lesions. Size varies from (2-10mm). They grow progressively in size and do not involute spontaneously.1,2Histologically it is a polypoid lesion with an overlying mildly acanthotic epidermis, a loose edematous fibrovascular core showing chronic inflammation, and a nerveless dermis.3,4

The study is aimed toestimate the prevalence of insulin resistance (IR) in patients with Skin Tags.

Objectives:

To determine ifacrochordons could be a marker of insulin resistance (IR) by comparing a case group (patients with skin tags) with the control group (patients without skin tags).
The parameterscompared was Blood pressure, Waist circumference and Body Mass Index (BMI)

Materials and Method:

Study design and study setting:

Its Hospital based Case - control study.The present study was conducted among the outpatients in the Department of Dermatology, Venereology, and Leprosy at reputed tertiary care centre at Pondicherry

Study population and Procedure:

Based on the previous years case medical record 150 cases and 150 controls (age, gender-matched)150 Patients with other dermatological complaints were included. Subjects fulfilling the eligibility criteria were requested to sign the informed consent form provided in the patient's native language for their convenience. Patients were clinically evaluated with detailed history, dermatological examination along with laboratory investigations. The data was collected by using two questionnaires specially designed for case & control groups after getting informed oral and written consent.

Inclusion criteria: For Case group, Patients with skin tags, both males & females (>18 years of age) and for Control group: Patients with other dermatological complaints both males & females (> 18 years of age)Exclusion criteria:Patients with diabetes mellitus, other endocrinopathies - (Cushing's syndrome, acromegaly, PCOS, thyroid dysfunction) Pregnant women.

Data collection:

Using the predesigned and pretested questionnaire, the basic details,Clinical assessment such as Body Mass Index (QUETELET INDEX) Weight in (kg)/ height in m2, 18.5 -25 (normal), 25- 29.9 (overweight) and 30 (obesity), Blood Pressure (mm/Hg) and the measurement cut off used were Systolic BP > 130mm/Hg and Diastolic BP >80 mm/ Hg. Regarding Waist circumference (cm)Males - (>90cm), Females - (>80 cm). Biochemical analysis, Blood glucose levels Fasting Blood Sugar (60- 100 mg/dl), OGTT (140- 200mg/dl), Fasting insulin levels 6 TO 27miu/L. Calculation of insulin resistance1. Homa –IR (Homeostasis Model Assessment –IR)
IR = ((Fasting Blood Glucose) * (Fasting Serum Insulin level)) / 405IR Value > 2.5 is significant.

Statistical Analysis:

Data was entered in Ms-excel and transferred in to the SPSS version 18, software package. Simple descriptive statistics as frequencies, percentages, mean, standard deviation. T test was performed for test of significance.

Results:

In the case group (patients with skin tags), out of 150 subjects who were enrolled in the study,39 patients had insulin resistance according to the HOMA-IR index. I50 patients were studied in the case group (patients with skin tags). Out of 150 patients in the case group (patients with skin tags), 39 patients had insulin resistance, which is 26 percent of 150 patients.

Patients, more than 18 years of age were enrolled in the study.In the case group (patients with skin tags) out of the 150 subjects enrolled 55 percent of patients were between (18- 30) years of age. Out of 150 subjects enrolled 28 percent of patients were between (31-and 40) years of age.Out of 150 subjects enrolled 17 percent of patients were between (41-and 50) years of age.In the present case-control study 150 patients were enrolled in the case group and control group.In the case group (patients with skin tags) 55 (37%) patients had increased BMI.In the control group (patients without skin tags) 20 (13%) patients had increased BMI.The prevalence of obesity was high in the case group when compared to the control group.

There is no significant correlation between the cases and control among different sex groups.There was a significant difference among cases and controls for weight and height parameters. Statistical significance was also noted for waist circumference and Hypertension among the study participants between the cases and controls.14 patients (9%) in the control group (without skin tags)had insulin resistance.

The present study showed increased blood pressure in 16patients (11%) in the control group.20 patients (13%) were obese, they had increased BMI.119 patients (21%) had abdominal obesity and increased waistcircumference in the control group.The commonest association in the case

group (with skintags) was acanthosis nigricans in 24 (62%) patientsfollowed by acne in 9 (23%) patients and dermatitis patients.

In the present study, 150 patients were studied in the case group and control group respectively. In the Case Group, 25 males and 125 females were studied. 39 patients (26%) with skin tags (case group) had insulin resistance. In the case group the prevalence of insulin resistance was more between 18-30 years of age (51%). The present study showed high blood pressure in 88 patients (59%) in the case group. Statistical analysis by the Chi-Square test was significant, the p-value is (.000). In the case group, 55 patients (37%) were obese and had increased BMI. Statistical analysis by the Chi-Square test was significant, the p-value is (.000). About 126 patients (84%) in the case group had abdominal obesity (increased waist circumference). In the Control Group, 25 males and 125 females were studied.

Discussion:

Acrochordons (skin tags) are benign lesions made of loose fibrous tissue seen over flexures and neck. They are soft, pedunculated protrusions .These lesions are common in women. The presence of obesity should always initiate a search for skin tags.Margolis et al investigated 500 patients(among which 47 patients had skin tags and insulin resistance was diagnosed in them 72%) 5Agarval.et al reported insulin resistance in 40.6% of 118 patients with acrochordons.6

Kahana et al studied 216 patients with skin tags and found insulin resistance in 26.38% of patients which was similar to the present study in which insulin resistance was 26% (39 patients out of 150).7 There are very few reports available in the literature to emphasize the correlation between hypertension and skin tags. Sari et al examined 113 patients with acrochondons and found that the frequency of hypertension was 30.1% and 21% of patients had insulin resistance in the study group. Significantly higher mean systolic and diastolic arterial pressure values were detected in patient group.8

Shah et al reported higher mean values of blood pressure in patients with skin tags(19%) when compared to the control group (patients without skin tags-6%).The present study shows higher values of systolic and diastolic blood pressure in patients with skin tags(41%) when compared to control group(11%).These patients warrant further investigation and surveillance of their lipid profile in view of evolving atherosclerosis.Rasi et all studied 104 patients with skin tags, out of which 24 patients showed increased Body Mass Index (BMI).Shah et al conducted a case-control study which showed increased value of BMI in patients with skin tags.9

Gumbiner et al reported mean BMI of his patients with skin tags was greater than 30. His patients were mostly obese.10Waist circumference is a component of metabolic syndrome. The study by Shah et al reported statistically significant higher waist circumference levels in patients with skin tags after a univariate analysis. The present study shows abdominal obesity in 84% of patients with skin tags when compared to patients without skin tags (79%).The variation in results may be due to ethnicity, place of study, sample size, occupation, food habits, family history, lifestyle of patients.

In the present study the commonest association with skin tags was acanthosis nigricans followed by acne. About 24 patients with skin tags have acanthosis nigricans and insulin resistance, and 9 patients had acne.11In conclusion, results of the present study reveal that patients with skin tags have significantly higher risk of developing diabetes, impaired carbohydrate metabolism. This finding has important clinical implications. Progression to overt diabetes remains undiagnosed until the patient develop significant end organ damage manifesting as cardio vascular diseases, stroke, deterioration of renal function, loss of visual acuity, neuropathy, limb ulcers. Recognition of possible risk factors helps in earlier diagnosis and in prevention of above mentioned complications. Skin tags are also a cutaneous marker of Syndrome X(Metabolic Syndrome).12

Compensatory hyperinsulinemia stemming from peripheral insulin resistance is the root cause of the metabolic syndrome(hypertension, diabetes, dyslipidemia, coronary artery disease, obesity and abnormal glucose tolerance) .Hyperinsulinemia elevates the level of insulin like growth factor-1(IGF-1) and simultaneously reduces insulin like growth factor binding protein -3 (IGFBP-3).Increased levels of IGF-1 binds to keratinocytes via receptors causing epidermal hyperplasia. These endocrine shifts alter cellular proliferation and growth which manifest as cutaneous papillomas(skin tags).13

Hence skin tags are indeed a marker of insulin resistance and patients with skin tags (acrochordons) must be evaluated for other underlying conditions like diabetes, atherosclerosis, dyslipidemias, and serum leptin levels. After assessment, the patient must be counseled on lifestyle modifications, weight reduction and therapeutic modalities in accordance with the age to prevent complications as soon as possible.14These measures go a long way in preventing evolving complications or disabling sequelae giving a good quality of life for the patients.15

Conclusion:

Acrochordons (skin Tags) is a simple tool for identifying people with insulin resistance. Identifying and screening for insulin resistance in a population with skin tags helps in reducing the global burden of Type II DM. Lifestyle modifications regarding dietary intake, and physical activity, should be initiated in this population. Several parameters like lipid profile, thyroid levels, USG abdomen, and serum leptin levels must be assessed in people with skin tags to reduce the risk of atherosclerosis and stroke. Educational, pharmaceutical, and lifestyle interventions should be initiated as early as possible to reduce the morbidity and mortality associated with diabetes mellitus. Screening of individuals with insulin resistance (pre-diabetes) provides an opportunity to identify those who are at high risk for developing overt type II DM and cardiovascular diseases.

Ethical statement

Ethical approval was obtained from the institutional ethical committee before the study and informed and written consent was obtained from the study participants.

Acknowledgments

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Disclosure

The authors report no conflicts of interest in this work.

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Tables and results

Table 1: Method of assessment

Methods of Assessment	Case Group(150) Number of patients (%)	Control Group(150) Number of patients (%)
Insulin Resistance(>2.5)	39(26%)	14(9%)
Blood Pressure(>130/80mm Hg)	88(59%)	16(11%)

Waist Circumference (>90cm(M),>80cm(F))	126(84%)	119(21%)
Body Mass Index(>30)	55(37%)	20(13%)

Figure 1: Insulin Resistance

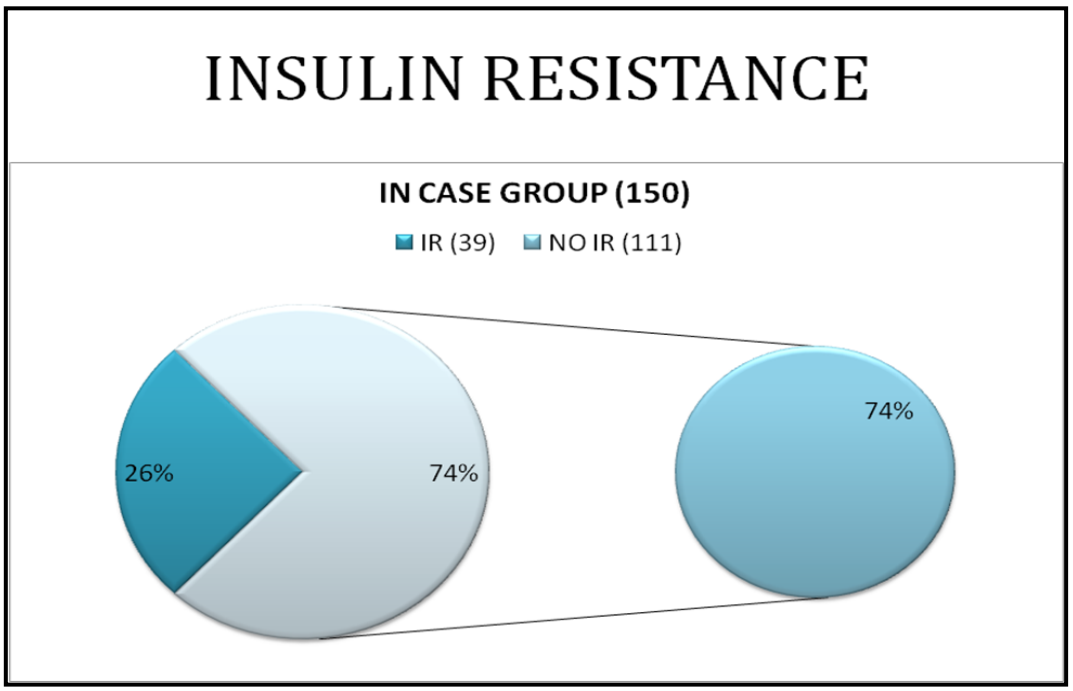

Figure 2: Age group

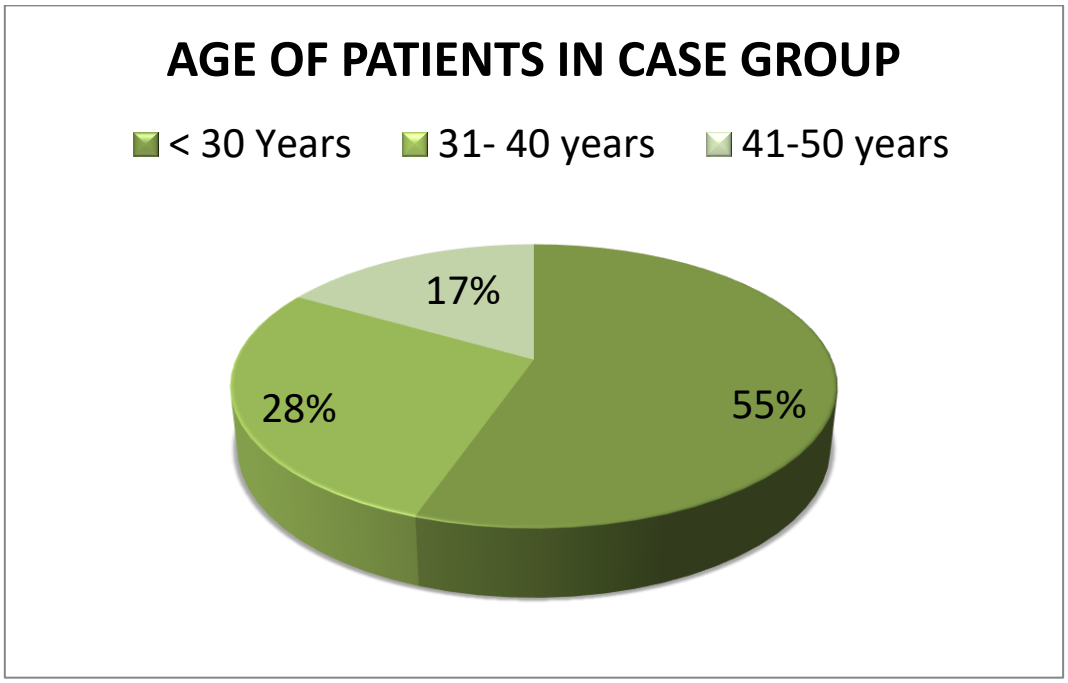

Figure 3: BMI of two groups

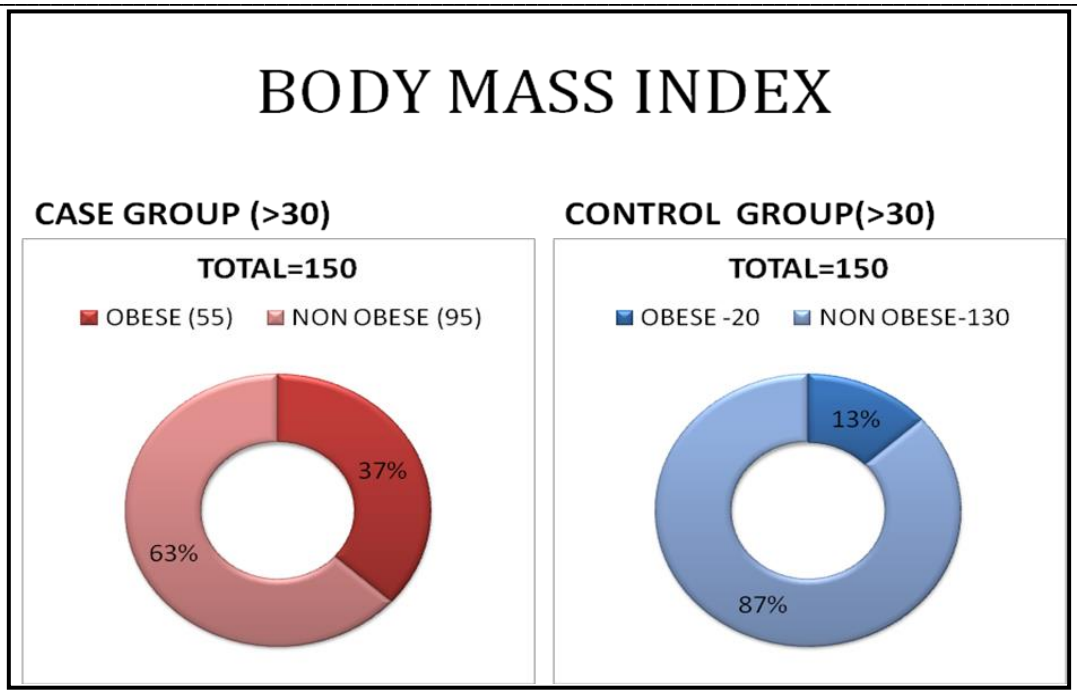

Table2: Gender difference in insulin resistance between two groups

Sex * GROUP Crosstabulation

			GROUP		
			CASE	CONTROL	Total
Sex	Male	Count	25	26	51
		% within GROUP	16.7%	17.3%	17.0%
	Female	Count	125	124	249
		% within GROUP	83.3%	82.7%	83.0%
Total		Count	150	150	300
		% within GROUP	100.0%	100.0%	100.0%

Table 3:T-Test- Case and control and weight, height, and BMI.

Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
Weight	CASE	150	74.11	11.942	.975
	CONTROL	150	70.94	14.199	1.159
Height	CASE	150	1.5901	.06427	.00525
	CONTROL	150	1.6835	.14038	.01146
BMI	CASE	150	29.3919	4.44744	.36313
	CONTROL	150	26.5795	3.53893	.28895

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Weight	Equal variances assumed	12.669	.000	2.090	298	.037	3.167	1.515	.185	6.148
	Equal variances not assumed			2.090	289.500	.037	3.167	1.515	.185	6.148
Height	Equal variances assumed	53.476	.000	-7.409	298	.000	-.09340	.01261	-.11821	-.06859
	Equal variances not assumed			-7.409	208.835	.000	-.09340	.01261	-.11825	-.06855
BMI	Equal variances assumed	3.721	.055	6.060	298	.000	2.81245	.46407	1.89918	3.72571
	Equal variances not assumed			6.060	283.688	.000	2.81245	.46407	1.89899	3.72590