

# Acrochordons and diabetes mellitus: A Case control study

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## Abstract

**Background:** Acrochordons (Skin tags) are common benign skin tumors usually occurring on the neck and major flexors of older people. These range in size from 1 mm to 1cm in diameter and are skin colored or brownish. A possible association with diabetes mellitus has been suggested in previous studies, but the result is not conclusive.

**Objectives:** The aim of this study was to find out the association of diabetes mellitus with acrochordons.

**Material and Methods:** One hundred and two patients were selected for the study. Among them 51 (males–23 and females–28) with acrochordons were taken as cases and 51 with other dermatologic disease after matching age and sex were taken as controls. The patients were selected from OPD of Department of Dermatology and Venereology in Universal College of Medical Sciences – Teaching Hospital (UCMS-TH). Blood glucose level including both fasting plasma glucose and 2-hour post-glucose load were determined for both case and control and compared.

**Results:** Patients with acrochordons had significantly higher frequency of diabetes than the control group ( $p < 0.001$ ). Total of 48.5% and 40% of patients with acrochordons having diabetes were obese and overweight respectively.

**Conclusion:** There is an increased risk of diabetes mellitus in patients with acrochordons. With regard to the importance of early diagnosis of diabetes, it is recommended a high level of suspicion for diabetes mellitus in patients with acrochordons.

**Keywords:** *Acrochordons, Diabetes mellitus, Skin tags*

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**Original Article****Introduction**

Acrochordons (Skin tags) are common benign skin tumors usually occurring on the neck and major flexors of older people. They range in size from 1mm to 1cm in diameter and are skin colored or brownish.<sup>1</sup>

Although usually asymptomatic, patients are often cosmetically bothered by these lesions. Furthermore, when the stalk of these pedunculated papules get strangulated or twisted, the lesions can undergo infarction and become irritated.<sup>2</sup> Prevalence of acrochordons in general population is difficult to find out because of under reporting. Nearly 60% of individuals acquire acrochordons by the age of 69.<sup>3</sup>

Acrochordons are thought to be relatively common skin lesions and it has been reported that they might reflect insulin resistance states. Moreover, obesity, dyslipidemia, hypertension, hyperglycemia, hyperinsulinemia and hyperleptinemia are known to be associated with insulin resistance.<sup>4</sup>

Diabetes Mellitus (DM) is a group of metabolic disease characterized by hyperglycemia resulting from defects in insulin secretion, insulin action or both.<sup>5</sup>

We conducted this study to show that like other risk factors, diabetes mellitus may be associated with acrochordons, thereby indicating acrochordons may be one of the skin markers for diabetes mellitus.

**Materials and methods**

The study was conducted as case-control study, in Department of Dermatology and Venereology, UCMS-TH, Bhairahawa, Nepal. The total number of patients enrolled were one hundred and two, among them 51 were cases and 51 were taken as controls, after matching age and sex. The study was started after taking approval from subject committee and Institutional review board, UCMS-TH, Bhairahawa. The period of this study was one year from September 2012 to August 2013.

Any patient with acrochordons at any site of the body presenting to dermatology OPD was taken as case. Any patient without acrochordons after matching age and gender was taken as control. Exclusion criteria were: secondary diabetes due to cushing's syndrome, acromegaly, pheochromocytoma, glucagonoma, hyperthyroidism and exocrine pancreatic disorders; patients under diabetogenic drugs like: nicotinic acid, glucocorticoids, thyroid hormone, alpha- adrenergic agonists, beta adrenergic agonists, thiazides, dilantin, pentamidine, interferon-alpha; patients known to be pregnant and patients who refused to participate in the study.

The will of subjects were fully respected and an informed consent was taken after fully explaining all the relevant details, its importance and implications. Those who did not give consent for any reason were excluded from the study. Blood samples were collected after an overnight fast of 8-14 hours, during which drinking water was allowed. After collection of fasting blood samples, the subjects were given 75 gm of anhydrous glucose in 250-300ml of water over the course of 5 min. Venous blood samples were collected 2 hours after the test load and immediately centrifuged for 4 minutes in 3000 rounds per minute(RPM) to separate the plasma. The test was done by Erba-Mannheim XL-300 automatic machine.

According to WHO, diabetes mellitus was diagnosed as fasting plasma glucose (FPG) =126mg/dl or 2-h post glucose load = 200mg/dl or both. Impaired glucose tolerance (IGT) was defined as 2-h post-glucose load = 140mg/dl and < 200mg/dl in patients who did not fulfill the criteria for diagnosis of diabetes.<sup>6</sup>

BMI was calculated as weight in kilograms divided by the square of height in meters. Overweight was defined as BMI = 25 and obesity = 30.

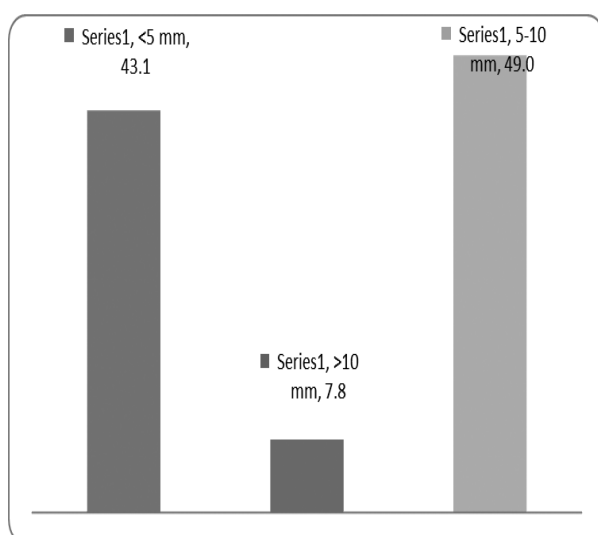
Data was recorded and analyzed by computer software SPSS ver.18. Independent t-test, p-value

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<0.001 was considered statistically significant.

### Results:

The total number was 102, among them 54.9% were female while 45.1% were male. The distributions of age group showed that maximum number of cases were from age group = 55 years (37.5 %). It was followed by age group between 45-54 years (35.3 %), then by age group between 35-44 years (19.6%). Minimum numbers of cases were from age group between 25-34 years (7.8%). Number of acrochordons in individual patient showed maximum number between 5-10 in 49.0% of cases, more than 10 skin tags in 7.8% cases and less than 5 skin tags in 43.1 % cases. The commonest sizes of acrochordons were between 5-10 mm (Figure 1).



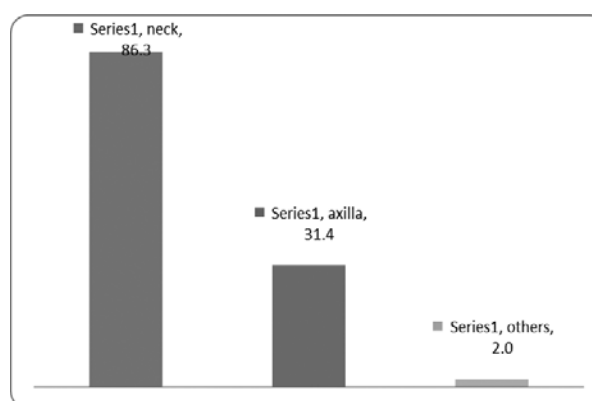
**Figure 1:** Frequency distribution according to various sizes of acrochordons.

Obesity was the most common systemic disorder seen with acrochordons, while Acanthosis Nigricans was the commonest cutaneous disorder seen with acrochordons. In some cases more than one associated disorder was present in single individual. Other associated cutaneous and non cutaneous diseases were tinea cruris, chronic paronychia, hypercholesterolemia, ischaemic heart disease and photodermatitis (Table 1).

**Table 1:** The frequency of co-existing cutaneous and non cutaneous diseases with acrochordons

Coexisting disease	Frequency
Hypertension	7
Acanthosis Nigricans	10
Obesity	33
Other	5

The distribution of acrochordons showed that, the maximum number was found in neck, followed by axilla and other body site (Breast, Inguinal area, Face, Extremities) (Figure 2).



**Figure 2:** Bar diagram showing frequency of acrochordons distribution according to sites

Mean fasting plasma glucose (FPG) was  $124.94 \pm 29.45$  in case and  $97.20 \pm 18.81$  in control. Similarly Post glucose load (PGL) was  $168.86 \pm 58.60$  in case and  $115.57 \pm 36.05$  in control. P value was <0.001 which is statistically significant (Table 2).

**Table 2:** Blood glucose level (F and PP) in cases and control

		N	Mean	Std. Deviation	P value
FPG	Case	51	124.94	29.45	<0.001
	Control	51		18.81	
PGL	Case	51	168.86	58.60	<0.001
	Control	51	115.57	36.05	

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BMI =30 was present in 48.5% of cases with diabetes. Similarly BMI was between 25-29.9 in

40% of case with diabetes and 18.5-24.9 in 37.5% of case with diabetes (Table 3).

**Table 3:** The frequency of different category of BMI in case and control

			Blood Sugar			Total
			Diabetic	Impaired	Normal	
Case	BMI	18.5 -24.9	3	1	4	8
			37.5%	12.5%	50.0%	100.0%
		25-29.9	4	1	5	10
			40.0%	10.0%	50.0%	100.0%
		>=30	16	4	13	33
			48.5%	12.1%	39.4%	100.0%
	Total		23	6	22	51
			45.1%	11.8%	43.1%	100.0%
Control	BMI	<18.5	0	1	1	2
			0.0%	50.0%	50.0%	100.0%
		18.5-24.9	0	3	20	23
			0.0%	13.0%	87.0%	100.0%
		25-29.9	3	1	11	15
			20.0%	6.7%	73.3%	100.0%
		>=30	0	2	9	11
			0.0%	18.2%	81.8%	100.0%
	Total		3	7	41	51
			5.9%	13.7%	80.4%	100.0%

### Discussion

The study showed that acrochordons is associated with Diabetes Mellitus (DM). When the blood glucose level in our study was analysed it was found that 45.1% was having diabetes, 11.8% was having impaired glucose and 43.1% had normal glucose level.

The result is consistent with the studies done in the past. The study done by Omar et al showed that the prevalence of Skin tags were more among diabetic patients.<sup>5</sup> Similarly, study of Demir et al<sup>7</sup> showed that patients with skin tags were found to have overt DM. They found diabetes in 73.3% of patients.

Similarly study done by Rasi et al showed that patients with skin tag had higher frequency of

diabetes than the control group (23.07% vs 8.51%,  $\chi^2$ - test, p value = 0.005).<sup>1</sup>

Senel al detected that acrochordons may be the cutaneous signs for the underlying impaired carbohydrate metabolism.<sup>8</sup> Similarly study done by Sari et al concluded that there is correlation between the presence of Skin tags and markers of the metabolic syndrome and increase risk of cardiovascular disease.<sup>4</sup> This indicates that our study supports the evidence that DM is associated with acrochordons.

The mechanism for evolution of acrochordons in diabetic patients is hyperinsulinemia. Insulin is a well-established growth-promoting hormone. Hyperinsulinemia elevates serum concentration of free insulin-like growth factor-1 (IGF-1), while

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simultaneously reducing insulin-like growth factor binding protein-3 (IGFBP-3). Binding of IGF-1 to its receptors on keratinocytes causes epidermal hyperplasia.<sup>1</sup>

In our study 17.6% had acrochordons less than 5 in number, 54.9% had 5-10 numbers and 27.5% had more than 10 acrochordons. While in study done by Rasi et al<sup>1</sup>, 13.2% of the patients, the total number of skin tags was low (arbitrary defined as < 10), in 59.3% of the patients it was moderate (10-29), and in 27.5% of the patients it was high (30).

In our study acrochordons were found at neck in 86.3% of patient, at axillae in 31.4% and 2% at other site, more than one site may be involved in single patient. Similarly in study done by Sari et al<sup>4</sup>, skin tags were detected on the neck in 77(68.1%) patients, on the back of the upper body in 30 (26.5%) patients, in the axillae in 23 (20.4%) patients, on the extremities in 6 (5.3%) patients. In our study less than 5mm sized acrochordons were seen in 43.1% of cases, 5-10 mm in 49% and >10mm in 7.8%. While in study done by Omar et. Al<sup>5</sup>, the mean number of medium size skin tags was significantly higher in diabetic participants than non diabetics (p = 0.003). Skin tags are related to obesity,<sup>9</sup> and a hormonal

mechanism has been suggested in obese females especially those with upper body obesity, where there is increased peripheral aromatization of androgens to estrogen.<sup>10</sup> Our study showed that 48.5% of patients with acrochordons having diabetes were obese and 40% were overweight. In fact, obesity, skin tags, and diabetes are often seen together. Similar study done by Rasi et al<sup>1</sup> showed that the prevalence of obesity in skin tag group was much higher than general population. The most important demographic change to diabetes prevalence across the world appears to be the increase in the proportion of people >65 yrs of age. Our study showed acrochordons most common in people =55 yrs age constituting 37.5% of cases. Similarly in study done by Omar et al<sup>11</sup> the mean number of skin tags increased with age and was common between 51-60 years.

**Conclusion**

As an association of DM was found with acrochordons, it is recommended that the patients should be screened for diabetes mellitus and repeat the diagnostic tests in cases with borderline results. It is important to note that acrochordons may not only be disorder of skin; systemic involvement should also be considered. Close monitoring and long term follow up should be done.

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