Nepal Med J 2021;04(06):51-57 OPEN ACCESS Crossref DOI: 10.37080/nmj

Association of acrochordons with diabetes mellitus: a hospital based case control study

Sunita Karki,[1] Anjan Rai,[1] Mahesh Pradhan[1]

[1]Department of Dermatology, Nobel Medical College Teaching Hospital, Biratnagar, Morang, Nepal

ARTICLE HISTORY
Received : 10 April 2021
Accepted: 5 June 2021

ACCESS THE ARTICLE ONLINE

DOI: https://doi.org/10.37080/nmj.147

ISSN : 2645-8438

KEYWORDS
acrochordons; body mass index; diabetes mellitus; skin tags

CORRESPONDENCE:
Dr. Sunita Karki
Department of Dermatology, Nobel Medical College Teaching Hospital, Biratnagar, Morang, Nepal.
Email: dr.sunitakarki@gmail.com

CONFILICT OF INTEREST : None

ABSTRACT

Introduction: Acrochordons or skin tags are common benign cutaneous tumors that occur especially over the neck and major flexures. A possible association between diabetes mellitus and dyslipidemia is observed in numerous past studies with varying results. We aim to find out the association of diabetes mellitus with acrochordons.

Methods: One hundred patients were enrolled in our study. Among them, 50 (27 males and 23 females) with skin tags were selected as cases and 50 with other dermatologic diseases after matching age and gender were taken as controls. Blood glucose levels including both fasting and postprandial glucose levels were determined for both cases and controls and compared.

Results: There was a higher frequency of Diabetes Mellitus and impaired glucose tolerance in patients with skin tags in comparison to controls ($p<0.001$). Moreover, there were higher odds of acquiring skin tags in patient with abnormal blood glucose levels.

Conclusions: There is an increased risk of developing DM in patients with skin tags. It is highly recommended that suspicion for Diabetes Mellitus is to be done in patients with skin tags for early screening and diagnosis of Diabetes.

INTRODUCTION

Acrochordons, also known as fibro-epithelial papilloma/polyp, soft fibroma/warts or skin tags generally; can be defined as a common benign skin lesion composed of loose fibrous tissue, occurring mainly on the neck and major flexures as a small, soft pedunculated protrusion.[1] These are small, flesh colored to dark brown, pinhead sized or larger, sessile or pedunculated papillomas frequently seen in the axillae, eyelids, trunk and groin apart from neck. The prevalence of skin tags in general population is difficult to extract due to underreporting. It is more common in adult to elderly population. Nearly 60% of individuals acquire acrochordons by the age of 69.[2]

There may be familial predisposition, and these are more commonly seen in obese individuals, often with overlying acanthosis nigricans

How to cite (Vancouver Style)
Karki S, Rai A, Pradhan M. Association of Acrochordons with Diabetes Mellitus - A Hospital based Case Control Study. Nepal Med Jor [Internet]. 2021Oct.1 [cited 2021Oct.1];4(1):51-57. Available from: https://www.nmj.com.np/nmj/index.php/nmj/article/view/147

(AN).[3] It was considered that most, if not all patients with AN had either clinical or subclinical insulin resistance (IR).[4] The growth hormone like activity of insulin may explain the potential link between the acrochordons and the metabolic syndrome.[2] Usually, there is association with abnormal lipid profile, type 2 diabetes, cardiovascular disease and obesity.[5] Skin tags are also said to be more prevalent in people with colonic polyps having gastrointestinal complaints.[6]

There are numerous skin diseases associated with Diabetes Mellitus, which often presents in dermatology OPD as an initial symptom; which on further investigations, the patient are found to be diabetic. Acrochordons is also one of them. Some of the studies have shown a prominent association between acrochordons and disease process leading to diabetes. In such scenario, patients who suffer from skin tags can be candidates for screening Diabetes Mellitus and dyslipidemia to prevent further complications and improve prognosis of the disease. Hence, this study is being conducted to investigate association of acrochordons with diabetes mellitus and other important co-morbidities.

AIMS AND OBJECTIVES

To assess the abnormalities in glucose levels in patients with acrochordons and find out the association of acrochordons with Diabetes Mellitus.

METHODS

This is a prospective, observational case-control study conducted in Nobel Medical College Teaching hospital in one hundred participants, out of which 50 were cases and 50 were patients with diseases other than acrochordons from 2018 Febrauary to 2019 July. Patients presenting with acrochordons at any site were included as cases while randomly selected age and gender matched individuals without skin tags as controls. Known case of diabetes mellitus, colonic polyp, patients under diabetogenic drugs: nicotinic acid, glucocorticoids, thiazides, thyroid hormone, beta-adrenergic agonists,p atients with other cutaneous conditions that has strong association with diabetes mellitus eg. necrobiosis lipoidica, candidiasis, patients who are pregnant and lactating mothers, patients with secondary diabetes due to cushing syndrome, pheochromocytoma, acromegaly, glucagonoma, patients who are below 16 years of age and patients who refuse to participate in this study were excluded from the study.

After selecting the cases and controls, they were sent to laboratory for fasting and 2 hours post prandial glucose tests who were not diagnosed as diabetes previously. Fasting plasma glucose > 126mg/dl and/or 2-hour post-glucose load > 200 mg/dl or known case will be diagnosed as diabetes mellitus. Fasting plasma glucose level of 100 mg/dl - 125 mg/dl and Two hour post-glucose load > 140mg/dl with excluding diabetes were diagnosed as impaired fasting glucose (IFG) and impaired glucose tolerance (IGT) respectively. Both of them are considered as impaired carbohydrate metabolism. Data was then, entered in MS Excel and statistical analysis done using statistical package for social sciences (SPSS) version 21. Ethical approval was taken from Institutional review committee.

RESULTS

In cases group there were 27(54%) male and 23 (46%) were female; whereas in the control group, the total number of males and females were 33(66%) and 17(34%) respectively, amounting to total of 60 males and 40 female participants in the present study. Number of skin tags in individual patient showed maximum number, >10 skin tags in 38% (19) cases, followed by <5 skin tags in 32% (16) cases and between 5-10 in 30% (15) cases. Family history of skin tags was present in 11 (22%) cases; maximum number of cases of skin tags that is 39 (78%) do not have family history. Overweight (48%), obesity (6%) and hypertension (10%) were found to be the common systemic disorders with skin tags while acanthosis nigricans (25%) was common as associated cutaneous disorder. The overweight patients are about 2.5 times likely to develop skin tags as compared to normal BMI patients [Table 1]. This observation was statistically significant as well.

TABLE 1. Relationship of BMI with development of skin tags

Body Mass Index (BMI)			**COR [95% CI] (p- value)**
	Case n(%)	**Control n(%)**	
Normal (18.5-24.99)	23 (46%)	34 (68%)	RC
Overweight (25-29.99)	24 (48%)	14 (28%)	2.534 [1.088-5.901] **(0.031)***
Obesity (>=30)	3 (6%)	2 (4%)	2.217 [0.343-14.327] (0.403)
Body Mass Index (BMI)	**Case or control n (%)**		**COR [95% CI] (p- value)**
	Case	**Control**	
Normal (18.5-24.99)	23 (46%)	34 (68%)	RC
Overweight (25-29.99)	24 (48%)	14 (28%)	2.534 [1.088-5.901] **(0.031)***
Obesity (>=30)	3 (6%)	2 (4%)	2.217 [0.343-14.327] (0.403)

**Significant,COR: Crude Odds Ratio, RC: Reference Category, CI: Confidence Interval*

Only one case of complication of skin tag, which was twisting of skin tags, encountered during our study period and he was managed accordingly. The commonest size of skin tags encountered in this study was < 5mm in 64% cases, followed by category between 5-10 mm (32%), then by > 10mm (4%). Among cases, the mean duration for the occurrence of skin tags in the study is 4.08 years ± 3.87 (ranges from 0.25 to 15 years). The maximum duration for cases of skin tags that were enrolled in the study accounted to between 1-5 years (70%), which was followed by >5years (22%) and lastly, <1year (8%). The maximum number of skin tags were having brown colour (76%). 16% were having black or hyperpigmented skin tags, and 8% were of mixed variation having both colours. Similarly, the commonest site was the neck (n=42, 84%), followed by axilla (n=19, 38%) then trunk (n=6, 12%) and other sites like groin, face (n=8, 16%).

Total number of cases suffering from diabetes were 14 (28%) and control were 6 (12%) (p-value 0.001) which concluded that it is statistically significant. Moreover, the total number of impaired glucose tolerant cases and controls were 24 (48%) and 14 (28%) respectively which was also statistically significant. Mean fasting glucose was 109.76 ±25.63 in cases and 99.48±27.29 in control. Similarly BS PP was 166.70±50.45 in cases and 145.40±34.58 in control. P value was <0.001 which is statistically significant.

TABLE 2. Variations in fasting and post-prandial blood glucose levels in cases and controls

Variables		**Cases**	**Controls**	**Total n(%)**	**P-value**
Fasting blood glucose	Normal	22 38.6%	35 61.4%	57 100%	**0.032**
	Impaired	20 64.5%	11 35.5%	31 100%	
	Diabetic	8 66.7%	4 33.3%	12 100%	
Post-prandial blood glucose	Normal	20 34.5%	38 65.5%	58 100%	**0.001**
	Impaired	20 74.1%	7 25.9%	27 100%	
	Diabetic	10 66.7%	5 33.3%	15 100%	

The patients with impaired fasting glucose (IFG) levels had almost three times higher odds of developing skin tags [COR: 2.89; 95% CI: 1.166 – 7.176] as compared to those with normal fasting glucose levels [p value<0.032]. Similarly, the patients with impaired post-prandial glucose levels (IGT) and those with diabetic blood glucose values had five times higher odds of developing skin tags [COR: 5.42; 95% CI: 1.964-15.004] and approximately four times higher odds of developing skin tags [COR:3.8; 95% CI: 1.142-12.64] respectively, compared to those with normal postprandial glucose levels. This relationship was statistically significant (p<0.001) [Table 3].

TABLE 3. Relationship between blood glucose levels with development of skin tags (n=100)

Blood glucose levels		**Case or control n (%)**		**COR [95% CI] (p- value)**
Case		**Control**		
Fasting BG	Normal	22 38.6%	35 61.4%	RC
	Impaired	20 64.5%	11 35.5%	2.89 [1.166 – 7.176] **(0.02)**
	Diabetic	8 66.7%	4 33.3%	3.18 [0.856 – 11.83] (0.08)
p- value = **0.032***				
Post-prandial BG	Normal	20 34.5%	38 65.5%	RC
	Impaired	20 74.1%	7 25.9%	5.42 [1.964-15.004] **(0.001)***
	Diabetic	10 66.7%	5 33.3%	3.80 [1.142-12.64] **(0.03)***
p- value = **0.001***				

**Significant,COR: Crude Odds Ratio, RC: Reference Category, CI: Confidence Interval*

DISCUSSION

Since TouraineA7 reported a possible association between acrochordon with DM and obesity in 1951, there have been numerous studies conducted in countries across the globe that illustrated an association between skin tags and diabetes mellitus. Similarly, this study was conducted to observe the association between skin tags and diabetes mellitus in our context.

Although acrochordons affect both genders, most of the studies show a female preponderance as in the study conducted by Jindal et al. which had 65 females and 45 males.8 Moreover, Shrestha et al. also revealed slight female preponderance in their study [28 (54.9%) female and 23 (45.1%) males among 51 patients with skin tags].[9] On the other hand, Tripathy et al. observed male predominance in their study where males outnumbered females with ratio of 1.69:1.10 This observation is very similar to our study where out of 50 cases with skin tags, the total number of male was 27 (54%) and the total number of female was 23 (45%). The reason behind this almost equal ratio of male to female ratio in our study could be attributed to limited study participants and variation in epidemiology and geographical topography of our country in comparison to other countries.

The mean age of cases was 44.12 ±10.900 (ranges from 22 years to 69 years) in cases and 45.30± 10.890 (ranges from 22 years to 67) in the controls. This observation was similar to the study conducted by Sari et al. where the mean age of study participants was 45.1 ± 13.6.11 Moreover, El Safoury OS and Ibrahim M also observed similar findings with the mean age of participants which was 45.30.

Generally, positive family history is also said to be associated with development of skin tags, which is supported by various studies like Shrestha et al. revealing 27.45% of patients with positive family history.[9] Among them, 13.72% were related as father, 7.84% were mother and 5.88% were brother or sister. This observation is quite similar to the present study. 22% of cases gave positive family history for skin tags. Similarly, Senel et al., a case control study published in 2011, also revealed 50 out of 110 cases to have family history of DM which was statistically significant compared to control group (p value <0.0001).[13]

According to our study, 32% cases had skin tags less than 5 in number, 30% had 5-10 in number whereas 38% had skin tags more than 10 in number. However, in a study done by Rasi et al.[14], mean skin tag number was 12.6 per subject. In 56 patients which amounted to be 36.8% of total cases, skin tag number was low (<10) whereas it was moderate (10-30) in 75 subjects (51.9%) and finally in 17 patients (11.1%), total body skin tags number was high (>30) quite contrary to our study.

The commonest size of skin tags encountered in our study was <5mm in 64% cases; followed by 32% patients having 5-10mm sized skin tags and finally the least case, that is 4% having skin tags sized more than 10mm. Similar to our results, in a study done by Tripathy et al. majority of the skin tags were less than 0.5cm (60.13%). Only few (2%) skin tags were more than 1cm.[10] While in a study conducted by El Safoury OS and Ibrahim M, the mean number of medium sized skin tags was significantly higher in diabetic participants than non-diabetics (p=0.003).[12]

In our study, 76% cases had brown or skin colored skin tags, 16% had hyperpigmented or black colour and about 8% had skin tags of both flesh color as well as hyperpigmented. This was supported by Tripathy et al. where majority of patients (49.62%) had skin colored skin tags.[10] Similarly, in a study done by El Safoury et al., 24 patients (60%) presented with flesh colored skin tags; 9 patients (22.5%) had pigmented skin tags and 7 patients (17.5%) showed mixed type skin tags.[15] Lastly, no significant association found between different age groups or gender with various skin tag characteristics such as number, colour or size similar to various studies.[10,14]

The majority of cases (84%) had their skin tags located at neck, in our study; while in 38% patients, skin tags were detected in axilla, followed by trunk (12%) and other sites like face and inguinal region in (16%) cases. These results are supported by study conducted by Jindal et al. where the most frequent localization of skin tags detected was in neck (42%,46/110) followed by axilla (25%, 27/110), trunk (12%,13/110), genital region (9%,10/110) and upper extremities (3.63%,4/110) in patient group.[8]

Skin tags do commonly appear in patients with obesity and was observed to be statistically relevant when compared to control group in 53.84% of patients in a study conducted by Faghihi.[14] Similarly, Sari et al. also concluded that the prevalence of skin tags correlated positively with the severity of obesity and a total of 61(53.9%) and 38 (33.6%) patients with skin tags were found to be overweight and obese respectively.[11]

There seems to be an association beteween acrochordons and diabetes mellitus concluded by various studies done in the past.[9,11,16,17] The study done by Demir S and Demir Y revealed that out of 120 patients with skin tags, 88 (3.3%) were found to have overt Diabetes Mellitus, 6 (5%) had an impaired overt DM and 4 (3.3%) patients had reactive hypoglycemia.[16] In remaining 22 (18.4%) patients, normal laboratory findings were obtained. These data concluded that there is significant association between acrochordons and diabetes. In a study, Agarwal J and Nigam P reported that out of total 118 patients (85 males and 33 females), an abnormality of glucose was detected in 48 (40.6%). Among these 48 cases, 36 were diagnosed as overt diabetics while 12 patients had impaired glucose tolerance.[18] The present study also concluded that there is a statistically significant association of acrochordons with Diabetes Mellitus. While analysing the blood glucose levels from the cases with skin tags, it was found that 28% were diabeitc and 48% had impaired glucose levels and remaining had normal glucose levels. And this relationship was found to be statistically significant (p<0.001).

Moreover, in our study, it was seen that those

with impaired fasting, impaired PP glucose and diabetics had higher odds of acquiring skin tags in comparison to those with normal blood glucose levels (p<0.001).

CONCLUSIONS

A significant association was found between skin tags and diabetes mellitus in our study. Hence it is highly recommended to advise blood glucose levels (both fasting and 2 hour post prandial blood levels) for patients in question. Also, since risk factors like obesity, association with acanthosis nigricans was seen in patients with skin tags; patients are to be made aware about it.

REFERENCES

1. Madan V, Lear JT. Benign keratinocytic Acanthomas and Proliferations. In: Griffiths C, Barker J, Bleiker T, Chalmers R CD, editor. Rook's textbook of dermatology. 9th ed. Chichester, West Sussex: John Wiley & Sons Inc.; 2016. p. 133.7

2. James WD, Berger TG, Elston DM. Andrews' Diseases of the Skin, Clinical Dermatology. 12th ed. Philadelphia: Saunders Elsevier; 2016.

3. Ko CJ. Dermal hypertrophies and benign fibroblastic/myofibroblastic tumours. In: Goldsmith L, Katz S, Gilchrest B, Paller A, Leffell D, Wolff K, editors. Fitzpatrick's Dermatology in General Medicine. 8th ed. United States of America: McGraw Hill; 2012. p. 712

4. Kahn CR, Flier JS, Bar RS, Archer JA, Gorden P, Martin MM, et al. The syndromes of insulin resistance and acanthosis nigricans. Insulin-receptors disorders in man. N Engl J Med. 1976;294(14):739–45. [PubMed] [DOI]

5. Crook MA. Skin tags and the atherogenic lipid profile. J Clin Pathol. 2002;55(8):639. [PubMed] [DOI]

6. Leavitt J, Klein I, Kendricks F, Gavaler J, VanThiel D. Skin Tags: A Cutaneous Marker for Colonic Polyps. Ann Intern Med. 1983 Jun 1;98(6):928–30. [PubMed] [DOI]

7. Touraine A. A new hereditary chain; cutaneous fibromas, diabetes, obesity. Ann Dermatol Syphiligr (Paris) 1951;78:409–16. [PubMed]

8. Shah R, Jindal A, Patel N. Acrochordons as a cutaneous sign of metabolic syndrome: A case-control study. Ann Med Health Sci Res. 2014;4(2):202. [PubMed] [DOI]

9. Shrestha P, Poudyal Y, Rajbhandari SL. Acrochordons and diabetes mellitus: A Case control study. Nepal J Dermatology, Venereol Leprol. 2016;13(1):32–7. [DOI]

10. Tripathy T, Singh BSTP, Kar BR. Association of Skin Tag with Metabolic Syndrome and its Components: A Case-control Study from Eastern India. Indian Dermatol Online J. 2019;10(3):284–7. [PubMed] [DOI] [Full text]

11. Sari R, Akman A, Alpsoy E, Balci MK. The metabolic profile in patients with skin tags. Clin Exp Med. 2010 Sep;10(3):193–7. [PubMed] [DOI]

12. El Safoury OS, Ibrahim M. A clinical evaluation of skin tags in relation to obesity, type 2 diabetis mellitus, age, and sex. Indian J Dermatol. 2011 Jul;56(4):393–7. [PubMed] [DOI]

13. Senel E, Salmanoglu M, Solmazgul E, Bercik Inal B. Acrochordons as a cutaneous sign of impaired carbohydrate metabolism, hyperlipidemia, liver enzyme abnormalities and hypertension: a case-control study. J Eur Acad Dermatol Venereol. 2011 Dec;27:2637-43. [PubMed] [DOI]

14. Rasi A, Faghihi A, Rahmanzadeh Y, Hassannejad H. A comparison study of lipid profile levels between skin tags affected people and normal population in Tehran, Iran. Adv Biomed Res. 2014 Mar 31;3:109. [PubMed] [DOI]

15. El Safoury OS, Ezzat M, Abdelhamid MF, Shoukry N, Badawy E. The Evaluation of the Impact of Age, Skin Tags, Metabolic Syndrome, Body Mass Index, and Smoking on Homocysteine, Endothelin-1, High-sensitive C-reactive Protein, and on the Heart. Indian J Dermatol. 2013 Jul;58(4):326. https://www.ncbi.nlm.nih.gov/pubmed/23919019 [PubMed] [DOI]

16. Demir S, Demir Y. Acrochordon and impaired carbohydrate metabolism. Acta Diabetol. 2002;39(2):57–9. [PubMed] [DOI]

17. Kurtipek G, Duran C, Kutlu O, Ataseven A, Akyürek F, Kurku H, et al. The frequency of metabolic syndrome in patients with acrochordons. Bangladesh J Med Sci. 2017;16(1):35–41. [DOI]

18. Agarwal JK, Nigam PK. Acochordon: a cutaneous sign of carbohydrate intolerance. Australas J Dermatol. 1987;28(3):132–3. [PubMed] [DOI]