ORIGINAL ARTICLE

Association of Acrochordon with Body Mass Index: A Hospital-Based Cross-Sectional Study

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Abstract

Introduction: Acrochordon, also known as skin tag, can be defined as a common benign skin lesion composed of loose fibrous tissue. With recent lifestyle modification, average body mass index has been increasing leading to potential health hazards, including acrochordons. This study was aimed to analyze the association between number, size and color of acrochordon to body mass index.

Methods: This is an observational cross-sectional study conducted among 146 patients with clinically diagnosed acrochordons visiting to the Department of Dermatology of a tertiary level hospital using a consecutive sampling method. Ethical approval was obtained from Institutional Review Committee of the same center prior to data collection (Reference number- PMD2305301730). This study focused to analyze the association between number, size and color of acrochordon to body mass index. The Fisher's exact test was used to analyze the association between two categorical variables and statistical significance was set at p value of <0.05.

Results: Among 146 participants, 95 (65.06%) were female, and 51 (34.94%) were male. The mean age was 43.31±12.73 years, the mean body mass index was 29.55±4.39. Higher prevalence of acrochordon was seen in obese and pre-obese patients. A significant association was observed between color of acrochordon and body mass index with no association between number and size of acrochordon to body mass index, with p-values of 0.301 and 0.232 respectively.

Conclusions: Most patients with acrochordons in our study were obese or pre-obese with significant association between color of acrochordon and body mass index.

Keywords: *acrochordon; body mass index; obesity; skin tag.*

Introduction

Acrochordon, also known as fibro epithelial polyp or skin tag (ST), represent one of the most prevalent benign dermatological conditions, characterized by skin projecting from the surrounding skin.[1] Prevalence of acrochordon is more common in adult to elderly population and nearly 60% of individuals acquire acrochordons by age of 69.[2] Prevalence of Acrochordon was found to be 0.4% in population-

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based study conducted in rural community (Nepal),[3] and 14.9% of total benign skin neoplasm in hospital-based study conducted in Manipal Teaching Hospital, Nepal.[4]

Recent changes in lifestyle have led to an increase in average Body Mass Index (BMI), potentially causing various health issues. Obesity has been implicated in its development; however, the relationship between BMI and specific clinical characteristics of acrochordons remains incompletely understood.

This study aimed to assess the association between BMI and the number, size, and color of acrochordons among patients presenting with acrochordons. Establishing a connection between BMI and characteristic of acrochordon could facilitate education on weight reduction and lifestyle modifications.

Methods

This was a hospital based observational cross sectional study conducted at Department of Dermatology and Venereology, Patan Hospital, a tertiary care center in Lalitpur, Nepal. Patients visiting the department, diagnosed as acrochordon clinically and who met the inclusion criteria were included in this study. Ethical approval was obtained from Institutional Review Committee (IRC) of Patan Academy of Health Sciences (PAHS) (ref-PMD2305301730). Written informed consent were obtained from all the participants. The total duration of this study was one year (May 2023 to April 2024 AD). Convenient sampling method was used. Sample size was calculated based on a Chi-square test of association.

Using Cohen's effect size:

$\alpha = 0.05$

Power = 80%

Medium effect size (w = 0.30)

$N = \lambda/w^2$

where N= Total sample size, λ= non centrality parameter and w= Cohen's effect size

For df= 4 with α= 0.05 and 80% power, λ=13.1

w= 0.3 (medium effect size)

N= 13.1/0.09= 145.5

Therefore, the minimum total sample size was 146.

The patients presenting or incidental finding during physical examination with acrochordon on the eyelid, neck, axilla and trunk and the patients of age more than 20 years were included in this study.

Pregnant and lactating women; patients younger than 20 years of age; patients with ascites, anasarca, elephantiasis, hypothyroidism, HIV infection, thyrotoxicosis, or malignancies (such as lymphoma and gastrointestinal malignancies) that could affect body weight; patients with conditions affecting height (such as dwarfism, acromegaly, kyphosis, or scoliosis); patients unable to stand erect for anthropometric measurements (e.g., those with hemiplegia or fractures of the lower extremities); and patients who had previously received partial treatment were excluded from the study.

Patients meeting the inclusion criteria were examined to find number, size and color of acrochordon and were classified using parameters modified from Safoury et al.[5] Weight and height were measured and BMI was calculated. Data entry and Statistical analyses was carried out using Epi Info™, Microsoft Excel 2016 and Easy R. The Fisher's exact test was used to test statistical significance and p value was considered significant if it was <0.05. Categorical variables were presented as numbers and percentages.

Results

A total of 146 patients were included in this study, among which 51 (34.94%) were male and 95 (65.06%) were female.

The age of patients ranged from 20 to 78 years and the mean age was 43.31±12.73 years. The most common age group was 40-49 years 44 (30.13%) and least common age group was >60 years 15 (10.27%).

The mean BMI was 29.55±4.39 ranging from 19 to 40 kg/m^2. Among patients with acrochordons, most participants were classified as obese 69 (47.26%) or pre-obese 59 (40.41%), while only 18 (12.33%) had normal BMI (Table 1).

Table 1: Nutritional status of study population (n= 146).

BMI	Nutritional status	Frequency n (%)
18.5-24.9	Normal Weight	18 (12.33)
25-29.9	Pre-obesity	59 (40.41)
≥ 30	Obesity	69 (47.26)

The number of acrochordons were many (>10) in 78 (53.42%), moderate (5-10) in 35 (23.98%) and few (1-5) in 33 (22.60%) of patients. Patients of 71 (48.63%) had small size (<0.5 cm) acrochordons, 49 (33.56%) had medium size (0.5-1 cm) and 26 (17.81%) had large (>1 cm) acrochordons. Mixed color acrochordons were present in 57 (39.04%) of patients, hyperpigmented in 49 (33.56%) and flesh color acrochordons in 40 (27.40%) (Table 2).

Table 2: Characteristic of Acrochordon (n=146).

Parameter	Subgroups	Frequency n (%)
Number of acrochordon	Few Moderate Many	33 (22.60) 35 (23.98) 78 (53.42)
Size of acrochordon	Small Medium Large	71 (48.63) 49 (33.56) 26 (17.81)
Color of acrochordon	Flesh color Hyperpigmented Mixed color	40 (27.40) 49 (33.56) 57 (39.04)

Table 3: Association between number of acrochordon and BMI.

No. of acrochordon	Nutritional Status			p-value
	Normal n (%)	Pre-Obesity n (%)	Obesity n (%)	
Few (n= 33)	4 (12.12)	18 (54.55)	11 (33.33)	0.301
Moderate (n= 35)	6 (17.10)	12 (34.30)	17 (48.60)	
Many (n= 78)	8 (10.30)	29 (37.20)	41 (52.60)	

There was no significant association between number of acrochordon and nutritional status (p-value= 0.301).

Table 4: Association between size of acrochordon and BMI.

Size of acrochordon	Nutritional Status			p-value
	Normal n (%)	Pre-obesity n (%)	Obesity n (%)	
Small (n= 71)	12 (16.90)	31 (43.66)	28 (39.44)	0.232
Medium (n= 49)	5 (10.20)	18 (36.73)	26 (53.06)	
Large (n= 26)	1 (3.85)	10 (38.46)	15 (57.69)	

There was no significant association between size of acrochordon and Nutritional status (p-value= 0.232).

Table 5: Association between color and BMI.

Color of acrochordon	Nutritional Status			p-value
	Normal n (%)	Pre-obesity n (%)	Obesity n (%)	
Flesh (n= 40)	2 (5.00)	17 (42.50)	21 (52.50)	0.046
Hyperpigmented (n= 49)	12 (24.49)	17 (34.69)	20 (40.82)	
Mixed (n= 57)	4 (7.02)	25 (43.86)	28 (49.12)	

There was significant association between color of acrochordon and nutritional status (p-value= 0.046).

Discussion

In our study, a total of 146 participants were included, among which 51 (34.94%) were males and 95 (65.06%) were females. The mean age of patients in our study was 43.31±12.73 years, ranging from 20 to 78 years. Most patients in our study belonged to the age group of 40-49 years which consisted 44 (30.13 %) participants.

The mean BMI of the participants in our study was 29.55±4.388, ranging from 19 to 40 kg/m^2. The majority of participants with acrochordons in our study were either obese (BMI ≥30 kg/m^2); consisting for 69 (47.26%) or pre-obese (BMI 25-29.9 kg/m^2) consisting of 59 (40.41%). A study conducted by Maluki M.D. et al. reported that mean BMI of acrochordon group was 32.5±6.2 and mostly obese (68.63%), while 19.61% were overweight.[6] Similarly Idris et al's study identified a mean BMI of the case was 26.43±3.21, 60% of cases are in the overweight group (BMI 25-29.9 kg/m^2) and 10% were obese (BMI >30 kg/m^2).[7] This finding aligns with our studies. However Kahana et al found that only 62 (28.7%) were obese and hence did not find an increased incidence with obesity.[8]

In this study the number of acrochordons was many (>10) in 78 (53.42%) among which 41 (52.6%) in obese, 29 (37.2%) in pre-obese patients and 8 (10.3%) in normal weight patient. Similarly moderate (5-10) in 35 (23.97%) among which 17 (48.6%) in obese, 12 (34.3%) in pre-obese patients and 6 (17.15%) in normal weight patient. Finally few (1-5) in 33 (22.60%) of patients among which 11 (33.33%) in obese, 18 (54.55%) in pre-obese patients and 6 (12.12%) in normal weight patient.

Most patients had many lesions among which higher percentage is covered by either obese or pre-obesity. On one hand, this finding goes with the results of Safoury et al. who reported mean number of STs was significantly higher among obese participants in comparison to the non-obese as well as with result

of Ramya N et al who reported that 54 % of patient had more than 10 acrochordons.[5,9] On the other hand, our study contradicts with the observation of Sherin et al, they reported number of acrochordons was 10 or <10 in most of the cases (73/100, 73%).[10]

There is increasing trend in the number of lesions as nutritional status worsens from normal to obesity in this study. As the lesion increases (from "Few" to "Moderate" to "Many"), the percentage of patients with obesity increases (from 33.3% to 48.6% to 52.6%) but analysis indicated no statistically significant association between number of lesions and the nutritional status of patients (p-value= 0.301) as given in Table 4. Results of our study aligns with the findings of study conducted by Rasi et al and Saxena et al who reported there is no relationship between the number of skin tag lesions with the BMI,[11,12] but contrasts with studies conducted by Jusuf et al and Hegazy et al who found that there is a correlation between the number of skin lesions with the increased of BMI values.[13,14]

In our study 71 (48.63%) patients showed small size (< 0.5cm) acrochordons which is more common in the pre-obesity 31 (43.66%) and obesity 28 (39.44%) compared to the normal group 12 (16.90%) Which is similar to study conducted by Sherin at al who found majority of patients (69/100, 69%) had acrochordons of size <0.5 cm[10] and Safoury et al who reported mean number of small size STs was significantly higher in obese subjects than non-obese[5], similarly in this study 49 (33.56%) had medium size (0.5-1cm) acrochordons which is Predominantly seen in the obesity group 26 (53.06%), followed by the pre-obesity 18 (36.73%) and the least in the normal group in 5 (10.20%), 26 (17.81%) had large (>1cm) acrochordons, trend remains similar, with the obesity group 15 (57.69%) having the highest count, followed by pre-obesity 10 (38.47%) and normal 1 (3.84%). Among patients with large lesions, the obesity group account for 57.69% of cases which indicate that patients with obesity are more likely to have larger lesions. There seems to be a trend indicating that as nutritional status worsens (from normal to obesity), the likelihood of having larger lesions increases. Conversely, patients with a normal nutritional status are more likely to have smaller lesions. On statistical analysis p-value (0.232) as given in Table 5, is greater than the common significance level of 0.05. This indicates that there is no statistically significant association between size of acrochordon and Nutritional status. This finding is consistent with other studies by Shah et al[15] in which Correlation and regression analyses showed no significant effect of BMI, the total number, pigmentation, size of acrochordons.

This study demonstrated that 57 (39.04%) had mixed color acrochordons, 49 (33.56%) had hyper pigmented and 40 (27.40%) had flesh color acrochordons. Majority of patient had Mixed color acrochordons which is in concordance with studies by Jusuf et al which showed majority of lesion was mixed type (56.2%)[13] but discordant with the observation of Sherin et al, Ramya N et al and Mustafa et al who documented majority of patient had hyperpigmented lesion 46%, 66% and 66.3% [9,10,16] respectively whereas Tripathy et al and Das et al found skin color was commonest type.[17,18]

Mixed color acrochordon was most prevalent among those with obesity 28 (49.12%) and pre-obesity 25 (43.86%), with very few cases in the normal BMI group 4 (7.02%) which is similar to finding of Safoury et al who documented prevalence of mixed-color STs was significantly more among obese participants compared to non-obese.[5] Hyperpigmented lesion was more common among individuals with obesity 20 (40.82%) and pre-obesity 17 (34.69%) but are also relatively present in individuals with normal weight 12 (24.49%). Flesh color acrochordons which was more common in individuals with obesity 21 (52.50%), followed by those with pre-obesity 17 (42.50%) and least 2 (5.00%) in normal weight patient. Flesh and mixed-colored lesions were higher in pre-obesity and obesity whereas hyperpigmented lesions are more evenly distributed but still show a trend towards higher BMI categories. Our study showed statistically significant association between color of acrochordon and Nutritional status (p-value= 0.046) as given in Table 6.

Our findings highlighted the importance of advising patients on weight reduction and lifestyle modifications for decreasing the disease burden and mitigate obesity-related complications. Furthermore, regular BMI monitoring and comprehensive evaluation of associated conditions are essential in patient with acrochordon.

The study was conducted in a hospital with a small sample size, which may limit the applicability of the results to the general population. Only individuals aged 20 years and older were included, making the findings less relevant for those younger than 20. Other factors related to metabolic syndrome, such as diabetes, hyperlipidemia, hypertension, and waist circumference, were not considered. Including these factors could have provided a more comprehensive understanding.

Conclusions

Our study revealed a significant association between color of acrochordon and nutritional status. We observed that acrochordons were more common in overweight and obese individuals.

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