A CLINICAL STUDY ON THE DERMATOLOGICAL MANIFESTATIONS OF OBESITY AT A TERTIARY CARE CENTRE IN COIMBATORE

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ABSTRACT

BACKGROUND

Obesity is a major concern in our era. Obese individuals have numerous physiological changes which predispose them to many dermatological conditions. This study was done to find the common dermatoses associated in adults with a BMI of > 30 kg/m^2 who presented to the Skin Outpatient Department of Coimbatore Medical College Hospital.

OBJECTIVES

To study the prevalence of various dermatological manifestations of obesity, age, sex distribution, morphology of individual lesions associated with obesity and their association with BMI and lipid profile.

METHODOLOGY

This is a descriptive study conducted from August 2014 to July 2015. Hundred patients with age > 12 yrs. and BMI > 30 kg/m^2 were selected and included in the study. Diabetes was ruled out and lipid profile was carried out for all patients. Other necessary investigations like biopsy, KOH mount and immunofluorescence were done for relevant cases.

RESULTS

There were 100 patients with 169 dermatoses seen in the study. Male female ratio was 1.5: 1. Most cases belonged to the age group of 31-40. Nearly 76% all cases were in grade 1 obesity according to their BMI levels. Only 3 cases were seen in grade 3 obesity. Lipid profile alterations were seen in 29% of all cases. Skin tag was the most common dermatosis seen in the study followed by acanthosis nigricans, plantar hyperkeratosis and striae.

CONCLUSION

Severity of obesity also determines the nature of lesions occurring in the patients. Early identification of these conditions can be useful in preventing the deleterious effects of obesity on the body. Treatment of lipid profile abnormalities in addition to weight reduction can decrease the occurrence of these dermatoses.

KEYWORDS

Obesity, Skin Tags, Acanthosis Nigricans, Plantar Hyperkeratosis, Lipid Profile.

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INTRODUCTION: Obesity, an epidemic of modern days is taking rapid strides in becoming the leading health care problem affecting not only the developed, but also the developing countries. It is found to alter the epidermal barrier of skin causing increased transepidermal water loss. It also affects the sebaceous glands, sweat glands and subcutaneous fat. Obesity is found to play a contributory role in various skin disorders like acrochordons, acanthosis nigricans, plantar hyperkeratosis, keratosis pilaris, striae, Dercum's disease, lymphoedema and hirsutism. Many infectious and inflammatory conditions like acne, folliculitis, hidradenitis suppurativa, psoriasis, seborrhoeic dermatitis and cellulitis have been proved to be aggravated by the co-existence of obesity. Grading of obesity is done by various measures, of which body mass index (BMI) is the most commonly used method.[1] Lipid profile alteration is one of the early markers of obesity which is found to be indirectly associated with acne, rosacea and hidradenitis suppurativa.

METHODOLOGY: This is a descriptive study of patients aged more than 12 years with BMI more than 30 kg/m^2. Ethical clearance and informed consent were obtained before proceeding with the study. Pregnant females,

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lactating mothers, severely ill, immunocompromised and type 2 diabetes mellitus patients were excluded from the study. Detailed history including age, occupation, duration of the disease and site of involvement was taken. Thorough general & systemic examination of the whole body was done. Dermatological examination with respect to the morphology, distribution and any special features of the lesions were done. Hair, nail, genital and oral mucosa were also examined in detail. Random blood sugar and lipid profile was done for the entire study population. Other necessary investigations like biopsy, KOH mount and immune-fluorescence were done for relevant cases.

RESULTS: One hundred patients above the age of 12 years with a BMI > 30 kg/m^2 formed the study group. There was a male preponderance of cases with a male to female ratio of 1.5:1. Patients were categorised based on WHO classification into three grades of obesity.[1] Study group were mainly in the grade 1 obesity with nearly 76% of total patients, 21% in grade 2 obesity and 3% patients were in grade 3. Out of 100 patients, 29 were with altered lipid profile.

Skin tag (Figure 1) was the most common disorder seen in the study with 45 cases (26.6%) followed by acanthosis nigricans with 21.3%. Plantar hyperkeratosis, striae, acne, intertrigo and dermatophytosis were the other common disorders. Hirsutism, folliculitis, adiposis dolorosa, lymphoedema and lipodermatosclerosis were the least common disorders (Table 1). Axilla was the most common site for skin tag. There were 12 cases of skin tag with abnormal lipid profile.

Acanthosis nigricans (Figure 2) was the second most common dermatosis with 21.3%. Male female distribution was nearly equal. There was significant family history in 11% of cases. Neck was the most common site of occurrence of lesions. Nearly 72% of AN cases were in grade 1 obesity. AN was the most common disorder associated with lipid profile abnormalities with 16 cases.

Plantar hyperkeratosis was seen in 17 cases (10.05%) with significant male predominance. Callosities (59%), corn (29.3%) and diffuse hyperkeratosis (11.7%) were the forms of plantar hyperkeratosis noted. Striae distensae (Figure 3) was seen in 9.4% with nearly equal male to female ratio. Abdomen was the preferred site of lesions.

Acne constituted 7.1% of cases, all of them being in grade 1 obesity. Ten patients had intertrigo (Figure 4), among them 6 showed an abnormal lipid profile. Tinea cruris was the most common form of fungal infection noted. Upper limb furunculosis was seen in five male patients with grade 1 obesity. Erythrasma formed 2.36% of all cases with axilla being the most common site. There were 3 cases of psoriasis, seborrhoeic dermatitis and candidiasis. Lipodermatosclerosis, lymphoedema, adiposis dolorosa, folliculitis and hirsutism were the least common disorders seen with one case each.

Sl. No.	Disorders	Percentage (%)	Grade 1 obesity	Grade 2 obesity	Grade 3 obesity	No. of Patients with Altered Lipid Profile
1.	Skin tag	26.6	34	9	2	12
2.	Acanthosis nigricans	21.3	26	8	2	16
3.	Plantar hyperkeratosis	10.05	12	5	0	5
4.	Striae distensae	9.4	11	4	1	6
5.	Acne	7.1	12	0	0	1
6.	Intertrigo	5.9	5	5	0	6
7.	Dermatophytosis	5.9	8	1	1	3
8.	Furunculosis	2.9	5	0	0	0
9.	Erythrasma	2.36	2	2	0	2
10.	Psoriasis	1.77	3	0	0	3
11.	Seborrhoeic dermatitis	1.77	3	0	0	0
12.	Candidiasis	1.77	3	0	0	0
13.	Lipodermatosclerosis	0.59	1	0	0	0
14.	Lymphoedema	0.59	1	0	0	0
15.	Adiposis dolorosa	0.59	1	0	0	0
16.	Folliculitis	0.59	1	0	0	0
17.	Hirsutism	0.59	0	1	0	1
	Total	**100**	**128(75.74%)**	**35(20.71%)**	**6(3.55%)**	**55**

Table 1: Various dermatoses and their association with grades of obesity and lipid profile alterations

Figure 1: Skin Tag

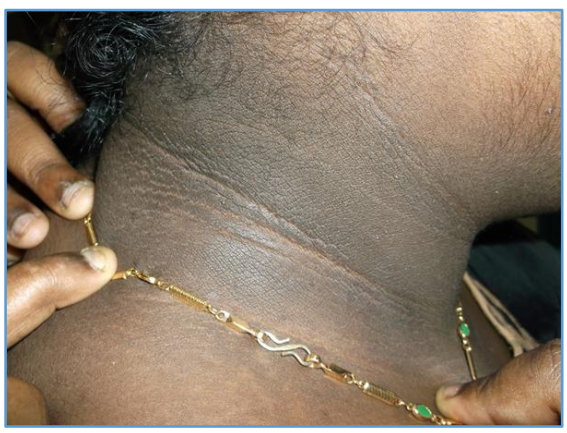

Figure 2: Acanthosis Nigricans

Figure 3: Striae Distensae

Figure 4: Intertrigo

DISCUSSION: Obesity is a common problem of this generation. A study by Unnikrishnan et al[2] done in major metropolitan cities on India showed prevalence of obesity to be nearly 6.8%. In our study, skin tag was the commonest disorder followed by acanthosis nigricans in contrast to a study by Al-Mutairi N[3] who showed plantar hyperkeratosis to be the most common. Our study showed a major share of cases in grade 1 obesity. There were 29 patients with abnormal lipid profile and a significant difference in occurrence of lesions among lipid profile altered patients.

Skin tags were the commonest skin condition associated with obesity in our study (26.6%) comparable to a study by Bhargava P et al.[4] Axilla was the commonest site for skin tag in our study, but neck was the preferred site in Bhargava P et al. A study by El Safoury et al[5,6] showed skin tags were associated with significantly higher levels of triglycerides and low HDL levels which was also seen in our study (21.8%).

Puri et al[5] described the occurrence of AN in obese individuals to be > 50% while it was 21.3% in our study. Males and females were nearly equally affected in contrast to similar study conducted by Varthakavi et al[6] who showed female to male ratio of 3.5:1. Neck was the most common site (56%) followed by axilla. AN was the most common disorder associated with an altered lipid profile in the study. Bruke JP et al [7] and Hernandez et al [8] showed patients with AN are at an increased risk for diabetes, increased triglycerides and low HDL.

Our study had 17 cases (10.05%) with plantar hyperkeratosis. Menz et al[9] showed increased body weight and foot deformities or postures can increase the risk for plantar hyperkeratosis. Excess weight and anatomical structure of the sole are the major determinants of hyperkeratosis.

Hsu HS et al[10] showed that obese individuals with high BMI are associated with higher risk for acquiring striae. Sixteen patients (9.4%) in our study had striae. Abdomen being the commonest site.

The incidence of acne was 7.1% which was only one third of the prevalence seen in Al-Mutairi.[3] Most of the cases seen were in 2nd and 3rd grades of acne. A study done by Roopam Bassi et al[11] on obese women with acne showed higher levels of triglycerides, total cholesterol, LDL and low HDL whereas in our study only one patient had abnormal lipid profile.

Intertrigo (5.9%), dermatophytosis (5.9%) and candidiasis (1.77%) are common in the areas of excess sweating and friction which is frequently seen in obese individuals. Bacterial infections like furunculosis, folliculitis and erythrasma are also commonly associated with obese individuals.

All the 3 patients with psoriasis in our study had alterations in lipid profile which is consistent with by Cho Rok Kim et al.[12] A study by Johnson et al [13] showed that increase levels of adipose tissues in body can increase the levels of cytokines, resistin and leptin which increases the T cells and monocytes leading to activation of Th1 and Th17 immune response. This can enhance immune response favouring exacerbations of inflammatory diseases like seborrhoeic dermatitis and psoriasis.

CONCLUSION: Life style modifications are the need of the hour in this era of obesity where more and more young children are growing up to be obese. Diabetes mellitus and lipid profile alterations may act in addition to obesity to alter the nature of these lesions. Any treatment for these dermatological conditions must include measures to control obesity and lipid abnormalities.

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