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ORIGINAL RESEARCH

Prospective Analysis of Impact of Obesity on Skin Infections at a Tertiary Care Hospital

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ABSTRACT

Background: Obesity is a worldwide major public health problem with an alarmingly increasing prevalence over the past 2 decades. The consequences of obesity in the skin are underestimated. The present study was conducted to assess the effect of obesity on skin infections.

Materials & Methods: In the present study conducted at Department of Dermatology, L. N. Medical College & Research Centre, Bhopal, Madhya Pradesh (India); a total of 90 obese subjects were enrolled in the study. All subjects attended dermatological examination for skin diseases. The *P*-values of 0.05 or less were considered to indicate statistical significance.

Results: Prevalence of Plantar hyperkeratosis, Skin tags, Striae distensae, Intertrigo (Candidal, dermatophytes, bacteria), Hyperhidrosis, Keratosis pilaris, Hyperpigmentation, Stasis pigmentation increases from BMI I to BMI III. Plantar hyperkeratosis showed a significant difference in three groups.

Conclusion: The study concluded that as obesity increases the prevalence to skin diseases also increases.

Keywords: Plantar hyperkeratosis, Skin tags, BMI, obesity.

INTRODUCTION

Obesity is a complex inflammatory chronic condition that affects both children and adults and has become a worldwide epidemic. Diets enriched in fat and calories and a sedentary lifestyle with limited physical activity are usually blamed for the increase in the prevalence of obesity. The most visible sign of obesity is accumulation of body fat.[1] According to the World Health Organization definition, a person is considered overweight if her/his body mass index (BMI) is >25, and obese if BMI is ⩾30.[2] Obesity influences not only the risk of getting various infections but also the outcome of the infection. There is a large amount of published work showing the effects of obesity on respiratory tract infections (RTIs), with obese individuals being at higher risk to contract both bacterial and viral infections as compared to lean controls.[3,4] Skin is the largest organ in the human body, accounting for 6-10% of total body weight, and accomplishing multiple functions: regulation of body temperature, moisture retention, vitamin D production, and protection of the inner organs from outside pathogens and toxins.[5] A large frequency of individuals with obesity (50%) display skin changes such as

mechanical friction, skin hypertrophic conditions (acanthosis nigricans, and fibromas or skin tags) and skin infections.[6] Staphylococcal and streptococcal infections of the skin are the most common gram-positive infections in obesity[7,8], which usually present with scrotal cellulitis (erysipelas) or atrophic round scars, secondary to the resolution of bacterial folliculitis.[6] The present study was conducted to assess the effect of obesity on skin infections.

MATERIALS & METHODS

In the present study conducted at Department of Dermatology, L. N. Medical College & Research Centre, Bhopal, Madhya Pradesh (India); a total of 90 obese subjects were enrolled in the study. Before the commencement of the study, ethical approval was taken from the Ethical Committee of the institute and informed consent was obtained from the patient. All subjects attended dermatological examination for skin diseases. Obese subjects were further divided into three classes of obesity: class I (BMI 30–34.9 kg ⁄ m^2), class II (BMI 35–39.9 kg ⁄ m^2) and class III (BMI ‡ 40 kg ⁄ m^2).[9] Statistics Values are given as mean ± SD. The *P*-values of 0.05 or less were considered to indicate statistical significance.

RESULTS

Prevalence of Plantar hyperkeratosis, Skin tags, Striae distensae, Intertrigo (Candidal, dermatophytes, bacteria), Hyperhidrosis, Keratosis pilaris, Hyperpigmentation, Stasis pigmentation increases from BMI I to BMI III. Plantar hyperkeratosis showed a significant difference in three groups.

Table 1: Dermatoses distribution in each group

Dermatoses	BMI I n=30	BMI II n=30	BMI III n=30	p-value
Plantar hyperkeratosis	0(0%)	3(10%)	22(73.33%)	<0.001
Pseudoacanthosis nigricans	5(16.66%)	3(10%)	9(30%)	0.3
Skin tags	25(83.33%)	26(86.66%)	30(100%)	0.2
Striae distensae	17(56.66%)	25(83.33%)	26(86.66%)	0.5
Intertrigo(Candidal, dermatophytes, bacteria)	5(16.66%)	9(30%)	10(33.33%)	0.5
Hyperhidrosis	5(16.66%)	9(30%)	10(33.33%)	0.2
Keratosis pilaris	1(3.33%)	2(6.66%)	5(16.66%)	0.3
Hyperpigmentation	0(0%)	2(6.66%)	5(16.66%)	0.2
Stasis pigmentation	0(0%)	0(0%)	5(16.66%)	0.06

DISCUSSION

Adipose tissue and particularly visceral fat are not only inert storage depots for lipids, but are also important in the integration of endocrine, metabolic and inflammatory signals.3–8 Adipokines (such as leptin and resistin) and pro-inflammatory cytokines [such as tumour necrosis factor-a and interleukin (IL)-6] are supposed to have a more complex role in cutaneous physiology and pathophysiology because of activating some modulators of both insulin resistance (Rs), and inflammation and wound healing. In particular, IL-6 cytokine is critically involved in the barrier repair after skin injury.[10]

Prevalence of Plantar hyperkeratosis, Skin tags, Striae distensae, Intertrigo (Candidal, dermatophytes, bacteria), Hyperhidrosis, Keratosis pilaris, Hyperpigmentation, Stasis pigmentation increases from BMI I to BMI III. Plantar hyperkeratosis showed a significant difference in three groups.

Hirt PA, et al did a review on the effect of obesity on the skin, including how increased body mass index affects skin physiology, skin barrier, collagen structure, and wound healing.

Obesity also affects sebaceous and sweat glands and causes circulatory and lymphatic changes. Common skin manifestations related to obesity include acanthosis nigricans, acrochordons, keratosis pilaris, striae distensae, cellulite, and plantar hyperkeratosis. Obesity has metabolic effects, such as causing hyperandrogenism and gout, which in turn are associated with cutaneous manifestations. Furthermore, obesity is associated with an increased incidence of bacterial and Candida skin infections, as well as onychomycosis, inflammatory skin diseases, and chronic dermatoses like hidradenitis suppurativa, psoriasis, and rosacea. The association between atopic dermatitis and obesity and the increased risk of skin cancer among obese patients is debatable. Obesity is also related to rare skin conditions and to premature hair graying. As physicians, understanding these clinical signs and the underlying systemic disorders will facilitate earlier diagnoses for better treatment and avoidance of sequelae.[11]

Guida B et al performed a study to highlight the incidence of some dermatoses in obese subjects and to study the water barrier function of obese skin using transepidermal water loss (TEWL). The results of this study showed that: (i) obese subjects show a higher incidence of some dermatoses compared with normal-weight controls; in addition, the dermatoses are more, frequent as BMI increases; (ii) the rate of TEWL is lower in obese subjects, than in the normal-weight subjects, particularly in patients with intra-abdominal obesity.[12]

CONCLUSION

The study concluded that as obesity increases the prevalence to skin diseases also increases.

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