

Dermatological changes associated to obesity: a literature review

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ABSTRACT

INTRODUCTION: Obesity is a chronic disease that is increasing in prevalence worldwide, and is a major contributor to health problems in most countries. This comorbidity increases the risk or is associated with more than 30 medical problems, including dermatological conditions. **OBJECTIVE:** To discuss the main dermatological changes related to obesity, in order to provide the clinician with an overview on the subject. **METHODOLOGY:** This is a systematic literature review study, in which the search was performed using the PubMed platform. **DISCUSSION:** Several changes in the skin and attachments have been linked to obesity, xerosis and changes in trans epidermal water loss; changes in collagen structure and wound healing; in the sebaceous glands and in the production of sebum and in the sweat glands. In addition to circulatory and lymphatic changes; obesity seems to be the main cause of microvascular dysfunction, contributing to the development of microangiopathy. **CONCLUSION:** Cutaneous manifestations also deserve due attention, as, on many occasions, it can manifest the first sign of a metabolic disorder.

Keywords: Obesity, Dermatological Changes, Metabolic Syndrome

1 INTRODUCTION

The morbidity and mortality associated with overweight or obesity are known for by the medical profession since Hippocrates times, for over 2500 years (Up to date, 2020).

The metabolic syndrome is the biggest public health care problem around the world. In the classical description of the metabolic syndrome, which includes insulin resistance, hyperglycemia, hypertension, atherogenic hyperlipidemia, pro-inflammatory and pro-thrombotic state, the obesity comes as its primary component.

Every clinical and laboratorial change in the metabolic syndrome, has a different impact in several internal and external tissues, including a risk factor combination for the coronary heart disease, mellitus diabetes, hepatic steatosis and various malignancies (Uzuncakma et al., 2017).

Obesity in a chronic disorder which is increasing in prevalence around the world. and is a major contributor for health problems in most of the countries. In 2015, approximately 108 million of children and 604 million of adults around the world were obese. That represents a predominant obesity increase in almost every country since 1980, and a double prevalence in 70 countries (Up to date, 2020).

Approximately 30% of the Americans are obese. Worldwide, the obesity prevalence varies form 7% in France to 32,8% in Brazil. It is more common in women and elderly people but it is increasing in children (Scheinfeld, 2004).

Obesity it's a multifactorial and heterogeneous disorder. Eating habits, genetic factors recently described, neurotransmitters regulating body mass and diet and the neuropeptides that influence the signs in the stomach, liver and blood, play important roles in their development (Hidalgo., 2002).

This comorbidity increases the risk or can be related to more than 30 medical issues, including dermatological conditions. The more common skin conditions are acanthosis nigricans, vascular stasis related pigmentation, hyperandrogenism, stretch marks, plantar and intertrigo hyperkeratosis. Friction and excessive moisture in the folds of the skin can lead to lesions, favour bacterial and fungal growth. Incisional healing is also impaired, due to the increased tension in the suture lines and decreased blood supply to the adipose tissue (Hahler, 2006) (Hidalgo., 2002).

This paper has the objective to resume the main dermatological amendments associated with obesity, in order to provide the clinician with an overview of the subject.

2 METHODOLOGY

This is a systematic literature review study, a type of investigation aimed at identifying, selecting, evaluating and summarizing the relevant available evidence (Galvão et al., 2014).

The search was performed using the PubMed platform, with the following descriptors: Obesity, changes, dermatological. 10 scientific papers were selected, those who have proved most complete in their approach to the theme and the publications of the last 20 years were prioritize.

3 DISCUSSION

Excess fatty tissue causes changes in skin physiology which predisposes obese individuals to the development of various skin manifestations and diseases (Hirt et al., 2008).

Many skin changes and attachments were linked to obesity, xerosis and changes in transepidermal water loss; changes in collagen structure and wound healing; in the sebaceous glands and in the production of sebum, which plays an important role in the development of acne; in the sweat glands, obese patients sweat more profusely because they have bigger skin folds and thicker layers of subcutaneous fat. In addition to circulatory and lymphatic changes, obesity can be the main cause of microvascular dysfunction, contributing to the development of microangiopathy.

The vascular distress among other vein complications can lead to varicose eczema and ulceration (Hirt et al., 2008).

The main metabolic and hormonal skin manifestations can be represented by acanthosis nigricans, acrocórdons and hyperandrogenism.

Acanthosis nigricans is characterized by irregular hyperpigmented and velvety in the folds of the body. The lesions surface can be warty, coriaceous or papillomatous. This condition is considered as a cutaneous marker of a systemic disease which require intervention; it has a well-established association with obesity (Hahler., 2006).

Obese people have higher levels of insulin than non-obese does. Biochemical mechanisms for the development of acanthosis nigricans involve significant insulin resistance in the cell, with compensatory hyperinsulinemia.

Hyperinsulinemia stimulates insulin-like growth factor receptors with subsequent induction of keratinocyte proliferation (Scheinfeld, 2004).

The acrocórdons are common, benigne, skin colored, small, soft, asymptomatic and pedunculated, which occur mainly on the neck and other bending surfaces. They have been related to various metabolic disorders as hypertension, metabolic disorder, dyslipidemia, obesity and cardiovascular disease. Both the incidence and number of acrocórdons increase with hyperinsulism.

The pathogenesis of the acrocórdons has not yet been clarified, however, its higher incidence in patients with insulin resistance and hyperinsulinemia highlights the role of the powerful proliferative effect of insulin in etiopathogeny (Uzunakma et al., 2017).

Hyperandrogenism in obesity is related to excess production of androgen by the ovaries (teak cells) as a result of hyperinsulinemia. Polycystic ovarian disease is more prevalent in obesity, although it can also occur in thin individuals without insulin resistance. Hyperandrogenism in women presents acne, hirsutism and menstrual disorder (Scheinfeld, 2004) (Hidalgo., 2002). The HAIR-AN syndrome, Hyperandrogenism, insulin resistance and acanthosis nigricans is a specific and rare subphenotype of polycystic ovarian syndrome characterized by the presence of severe insulin resistance. This syndrome is seen in almost 5% of woman with hiperandrogenism (O'Brien et al., 2020) (Elmer et al., 2001). The incidence of skin infections and inflammatory lesions seem to increase with obesity. We can mention candidiasis, intertrigo, folliculitis, furunculosis, erythrasma, tinea cruris, suppurative hydradenitis, psoriasis, rosacea, atopic dermatitis, among others. Although none of the following infectious complications are specific to obesity, previous studies have documented increased incidence within this population with clinical relevance (Yosipovitch et al., 2007).

Obese patients have excessive fat folds and sweat more profusely due to the thick layers of subcutaneous fat. Skin conditions commonly present in skin folds include intertrigo, yeast dermatitis and fissures. The skin may become erythematous, pustules may form and then rupture, and new pustules may develop in the periphery. This in turn leads to areas of inflammation and rashes. Patients may complain of itching or burning (Hahler, 2006) (Hidalgo, 2002).

Psoriasis is a chronic inflammatory condition mediated by the immune system, affecting 2% of the world's population. It manifests itself in multiple clinical presentations that affect the skin, joints or both. Patients with psoriasis are also at greater risk of developing other significant chronic conditions. Of particular interest are the strong links between psoriasis and metabolic syndromes (Fanning et al., 2017). The severity of psoriasis has been associated with obesity. The clinical response to the biological and systemic therapy used to treat moderate to severe psoriasis appears to be less effective in patients with a higher BMI (Hirt et al., 2008).

Suppurative Hydradenite, it a chronically recurrent inflammatory disease which mainly affects the armpits, groin, perineum, anogenital and inframammary region. Women seem to be more often affected by Suppurative Hydradenite than men, with the course of illness being more severe in them. Genetic predisposition seems to be a risk factor for Suppurative Hydradenite (Melibary, 2018). A retrospective analysis showed that the prevalence of SH among a cohort of patients seen in a dermatology clinic for HS was as high as 50.6%.

Previously considered a rare condition it is believed that the Suppurative Hydradenite has a prevalence of between 1-4%. The pathogenesis of this condition remains unclear. Several factors including genetics, smoking, infection and obesity were all involved. Regarding the etiology of the potential link between metabolic syndrome and Suppurative Hydradenite, there is doubt as to whether

a chronic inflammatory process can be enough to explain the link, this is due to the apparent dissociation between the gravity and duration of the SH (Fanning et al., 2017).

4 CONCLUSION

Obesity is the biggest public health problem today, responsible for intense morbidity and mortality of the population and increased cardiovascular risk. However, the skin manifestations also deserve due attention, because on many occasions it can manifest the first sign of a metabolic disorder. Without forgetting that it is an important factor of negative impact on the mental health of these patients, capable of affecting their self-esteem and self-acceptance.

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