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Review Article

MAJOR DERMATOLOGICAL CHANGES IN OBESE PATIENTS

As principais alterações dermatológicas em pacientes obesos

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ABSTRACT - *Introduction* - Obesity is a serious chronic disease that has reached global proportions causing problems to public health. In Brazil, the prevalence of this disease shows a progressive increase in the number of people with overweight or obesity. Nevertheless, the skin manifestations have not been well studied. ***Objective* -** To analyse the dermatosis most affecting obese patients and its treatment, particularly in proper application of dermatological therapy. ***Method* -** Was made a literature review between 2000 and 2010 of articles published in Medline/ PubMed, SciELO and Lilacs, books and monographs of the libraries of the University of Fortaleza and the Federal University of Ceará, Fortaleza, CE, Brazil, crossing the headings obesity, dermatosis, therapy and physiotherapy. Were recognized as most important the following pathological conditions: stretch marks, cellulitis, acanthosis nigricans, acrochodons, tenderness, ulcers and impetigo. Among the forms of treatment was highlighted the role of dermatological physiotherapy. ***Conclusion* -** Dermatosis treatment by dermatological therapy and physiotherapy is possible and can bring result that satisfy the expectations of patients and providing them better quality of life.

HEADINGS – Obesity. Skin diseases. Physical therapy.

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RESUMO – *Introdução* - A obesidade é considerada grave doença crônica que vem atingindo proporções mundiais gerando transtornos sérios para a saúde pública. No Brasil, a prevalência desta doença denota aumento progressivo em relação ao número de pessoas com sobrepeso e/ou obesidade. Apesar disso, as manifestações dermatológicas da obesidade têm sido pouco estudadas. ***Objetivo*** - Abordar as dermatoses que mais acometem pacientes obesos e seu tratamento, principalmente na aplicação adequada da fisioterapia dermatofuncional. ***Método* -** Revisão da literatura, entre 2000 e 2010, de artigos indexados nas bases Medline/Pubmed, Scielo e Lilacs, livros e monografias das bibliotecas da Universidade de Fortaleza e Universidade Federal do Ceará, Fortaleza, CE, Brasil, cruzando os descritores obesidade, dermatose e fisioterapia. Foram reconhecidas como mais importantes as seguintes situações patológicas: estrias, celulite, acanthosis nigricans, acrocórdons, flacidez, úlcera e impetigo. Entre as formas de tratamento deu-se destaque à atuação da fisioterapia dermatofuncional. ***Conclusão*** - O tratamento das dermatoses por meio da fisioterapia dermatofuncional é possível podendo trazer consigo resultados que satisfaçam a expectativa dos pacientes e proporcionando-lhes melhor qualidade de vida.

DESCRITORES - Obesidade. dermatopatias. Fisioterapia.

INTRODUCTION

To begin a study on obesity it is necessary to consider the diversity of etiologic factors that determine the dimensions and also to understand pathophysiological, social, cultural, economic and psychological aspects that are inserted in this context. Added to this, is necessary to understand these factors after bariatric surgery.

Obesity in ancient times was known as a sign of wealth, "good life"; obese people were well seen, because they were considered more healthy than thin people. Currently, is regarded as universal disease of epidemic prevalence and known as the evil of the twentieth century[34].

The Latin American Consensus on Obesity was defined as a chronic disease associated with a variety of complications resulting from the deposition and accumulation of excess adipose tissue[4].

The pattern of food intake nowadays has generated change in lifestyle adopted by the people, adapted to new conditions of time, money, work, frequency of purchase, and others[22,23].

Obesity is directly related to the high prevalence and intensity of dermatosis related to the large volume of skin folds, circulatory disorders, metabolic, difficulty in handling hygienic maneuvers most affected by physical limitations. It is worth mentioning the scarcity of studies in this research line[9].

This study emphasizes the anatomy and physiology of the skin, obesity and/or overweight and the skin changes related to it, emphasizing the physical therapy treatment.

METHOD

Review of the literature between 2000 and 2010 of articles indexed in Medline/Pubmed, Lilacs and Scielo, books and monographies of the libraries of the University of Fortaleza and the Federal University of Ceará, Fortaleza, CE, Brazil, crossing the headings obesity, dermatosis, therapy and physiotherapy.

Anatomy and physiology of the skin

The skin is essential to life and isolates the organic components from the external environment[36]. It represents 12% of the total dry weight of the body, with approximately 4.5 kg and is the largest organ exposed to the environment[20]. Although it represents less than 15% of body weight, is considered the largest human organ, because its length corresponds to an area of two square meters[24].

It is composed of ectoderm and mesoderm tissues which were arranged in three distinct layers: epidermis, dermis and hypodermis. The latter is not considered by many authors as part of the skin, although it is studied within the integumentary system[24].

The boundary between the epidermis and dermis is not regular, but characterized by the presence of bumps and re-entrance of the layers that embrication and fit together to form the dermal papillae[20].

Epidermis

The epidermis is essentially a stratified keratinized epithelial tissue with significant functional and structural variations depending on their anatomical site. It consists of: keratinocyte system, responsible for the body of the epidermis and its appendages (hair, nails and glands); melanin system with immune function, merkel cells integrated into the nervous system and indeterminate dendritic cells, with poorly defined function[3].

Its main function is to produce keratin, soft fibrous protein responsible for skin impermeability; the cells that are involved are called keratinocytes[24].

The deepest portion of the epidermis consists of epithelial cells that proliferate continuously in order to maintain their numbers. Typically, as in all epithelia, no blood vessels exist in the epidermis, although the underlying dermis is well vascularized. As a result, the only means by which cells of the epidermis can obtain food is through the diffusion capillary beds of the dermis. This method is sufficient for cells to live closer, but as they divide and are pushed to the surface, are far from a food source (dermis) and die[20].

Dermis

Beneath the epidermis is the main mass of skin, the dermis, a tissue strong, supple, with viscoelastic properties, which consists of a loose connective tissue composed of fibrous proteins (collagen and elastin) embedded in an amorphous substance basal[19].

The dermis is attached to the fascia of the underlying muscles by a layer of loose connective tissue, the hypodermis. Therein lie some elastic and reticular fibers, and many collagen fibers being supplied by blood vessels, lymph vessels and nerves. It also contains specialized glands and sense organs[20]. It has variable thickness along the body, from 1 mm to 4 mm, and consists of three parts: the papillary dermis, adnexa and the reticular[36]. Superficial papillary dermis is thinner and fills the hollows between the epidermal ridges, giving rise papillae or dermal ridges. Composed of loose connective tissue, consists of fine bundles of collagen fibers, reticular and elastic fibers arranged in a loose network. The papillary layer of the epidermis is separated by the basal lamina[15]. Adnexal dermis is structurally identical to papillary, willing, however, around attachments; composes, together with the papillary dermis, the anatomical unit called adventitial dermis[36]. Reticular dermis or deep is the thicker, consisting of dense connective tissue, and is so named due to the fact that the bundles of collagen fibers that comprise it are interwoven in a similar arrangement to a network[20].

Like any tissue, the dermis contains many different types of cells including fibroblasts and fibrocytes, tissue macrophages, melanophages, mast cells and blood leukocytes, particularly neutrophils, eosinophils, lymphocytes, monocytes and plasma cells[15].

Obesity and / or overweight

These two terms, that are mistakenly used as synonyms, have important differences in terms of the nature of these states, the levels of risk for morbidity and mortality as well as to determine the

contributions and limitations of regular physical activity in these populations[8].

Castro[13] indicates significant difference between obese and those who are overweight. For these authors, the excessive accumulation of adipose tissue characterize obese individuals. But those who are overweight, exceeding the average weight of the population, present a set of general physical components such as muscles, bones, visceral organs and body fluids at levels above the average population. As an example, can be cited the bodybuilding, where individuals have excessive weight with low percentage of adipose tissue.

In 1998, the World Health Organization proposed a classification for body weight based on body mass index (BMI) also known as index Quatelet determined by the weight in kilograms divided by height in meters squared (kg/m^2). The value thus obtained establishes the diagnosis of obesity and also characterizes the degree of risk associated with it[8].

According to the distribution of body fat can be classified obesity into three groups: diffuse or generalized; android (more common for men), associated with a higher concentration of fat in the abdominal region, and intravisceral strongly related to high risk for metabolic diseases and cardiovascular disease; and gynecoid obesity (more common for women) in that replacement of fat is predominantly in the hip region and associated with increased risk of osteoarthritis and varicose vein[16,30].

Based on this classification the waist-hip ratio - obtained by dividing waist circumference by hip circumference - is also considered an indicator of risk for complications of obesity. Men and women with waist-hip ratio of 94 and 80 cm respectively, are risky when this value is 100 cm for men and 88 cm for women; this risk increases even more, according to the recommendations for the loss weight of the National Heart Lung and Blood Institute.

Skin changes

Grooves

Stretch marks - skin fragility in the regions of the folds, a tendency to fungal infections and acanthosis nigricans, a darkening of the skin in the armpits and neck - are skin changes commonly found in obesity.

Disruption of elastic fibers are located on the second layer of skin, the dermis. This disruption causes atrophy, defined as cutaneous atrophy gained, linear, with one or more millimeters[29].

Present themselves as perpendicular cracks to the skin and parallel to other striations. They tend to be bilateral, distributed symmetrically on both sides[14].

They appear as erythematous-purpuric changes that evolve into white and atrophic. Mechanical factors, hormonal and genetic factors contribute to its onset. Can be considered scars resulting from injury of the dermal connective tissue in which collagen yields in response to local forces stressful. Obesity, pregnancy, Cushing's syndrome and use of topical or systemic corticosteroids are associated with its emergence[9].

Measures of physiotherapy treatment for stretch marks[7], are performed with microdermabrasion (crystal peeling) with the advantage of non-invasive technology and non surgical procedure due to his special technique of removing aged cells, stimulating the production of young cells and new collagen.

The striat[25], is a device used for the treatment of stretch marks; can serve up to 40% improvement in the appearance in streak had brefore. This equipment uses a needle that is inserted into the subepidermal, triggering local inflammatory process that leads to healing, promoting a better appearance to the skin.

Cellulitis

Common disease primarily affecting women and is cause of aesthetic discomfort[18]. The terms used to define these changes in the subcutaneous tissue, are the most diverse.

It arises from changes in fat tissue, connective tissue and blood vessels. Estrogen, the female hormone, may act on the vessels, increasing or decreasing the irrigation area. This compromises the tissues that can become fibrous tissues[31].

According to Souza[38] cellulitis is infection of the dermis and subcutaneous tissue, characterized by redness, swelling and pain, usually caused by group A *S. betahemolític* and *S. aureus* in adults, and *H. influenza* type B in children under three years old. Occurs near the surgical wounds, ulcers or on normal skin. Recurrent episodes occur by lymphatic anomalies and/or venous damage, or due to previous existed cellulitis, an operation for resection of lymph nodes or radiation.

New classification is proposed by Godoy[21], which emphasizes the clinical aspects, physical appearance, as follows:

1) edematous aspect: there is a predominance of changes in capillary permeability in which the woman may have pain due to fluid overload of the venous system, being aggravated by posture and during menstrual periods;

2) hardened aspect: it is the predominant form of "pure" cellulitis, usually not painful;

3) lipoedematous aspect: it is the pattern in which there is a predominance of obesity may be associated or not with swelling, tenderness and flaccidity is often exaggerated;

The cellulitis treatment is difficult, but the combination of the various means available in dermatological therapy, coupled with the participation of patients, can lead to good results[20].

The metabolic action of ultrasound in cellulitis is very beneficial, producing molecular microvibrations characterized as micromassage into tissue joints. The thermal action resulting from the friction produced by micromassage also markedly stimulates microcirculation. As a consequence, the metabolic effects, the increasing of cell membrane permeability and fibrinolytic action make him a valuable method for treating cellulitis[35].

The electrolipophoresis is for treatment of adiposity and accumulation of fatty acids. Characterized by applying low-frequency with microcurrent (around 25 Hz) that acts directly on adipocytes and accumulated lipid, producing and promoting their destruction and later disposal[7,37].

Acanthosis nigricans

It is a dermatological condition characterized by thickening, hyperpigmentation and accentuation of skin lines, creating a rough and velvety appearance at the affected site[2].

It presents as plaques of hyperchromic papillomatous surface, vegetative, dark brown color to black, located in the armpits, groin, neck and other intertriginous areas. Endocrine diseases represent the most frequent cause of this condition, with obesity as the disorder most commonly related to pseudo acanthosis[9].

Diagnosis of this injury - papillomatosis, hyperkeratosis and hyperpigmentation of the epidermis - is done by clinical examination of the cervical, axillary, antecubital, inner thigh and extensor phalangeal surfaces[11].

There is no specific therapeutic approach for them[5]. It is best to correct the associated disease. Correction of hyperinsulinemia in general is capable of reducing the number of injuries.

Acrochodons

Common skin lesions in the population and are associated with obesity. Early identification of patients with insulin resistance may have primary preventive role[39]. Papillomas are small, generally located on the sides of the neck, armpits, upper chest and eyelids of patients middle-aged or elderly. These benign epithelial hyperplasia are favored by obesity[6]. Are filiform papules, pedunculated, skin color or dark brown, mainly located in the neck and armpits. Are often associated with acanthosis nigricans and are also related to insulin resistance. There seems to be correlation between the lesions and the degree of obesity[9].

Treatment options are botulinum toxin, fillers and chemical peels or laser aiming rejuvenation[28]. There are cases where this treatment is done after treatment of upper face by blepharoplasty or facelift surgery, or ritidectomia to improve the appearance of the lower face and upper neck.

Laxity

Refers to decreased muscle tone, whem the muscle is inconsistent. This situation may present itself in two ways: the sagging muscle and skin. It is very common for both types appear associated, resembling the worse parts of the body affected by the problem. The muscles are flaccid, largely because of lack of exercise. If they are not required, the muscle fibers become flaccid[26].

The flaccidity of the skin is due to the viscoelastic behavior, when their elastic limit is exceeded for any reason - for example in a person that becomes obese in a short period of time and then lose weight again – the skin does not return to its original size[20].

The application of Russian's current has the objective to minimize sagging and loss of muscle tone. With new technology to build devices roller chain, its clinical use may include control of pain and, if used properly, can get effective pain relief during movements or exercises to increase range of motion. These applications are mainly direct to nerve endings[1].

Ulcer

Maffei[27] elucidate that ulcers are an important complication of acute or chronic venous insufficiency, which can be classified as pressure ulcers, arterial, and neuropathic.

According to Potter[33], the pressure - also known as bedsores - are injuries caused on skin due to lack of blood to an area of the body. These ulcers arise from factors internal and external of the patient.

Studies of Carrara and Brito[12] suggest that the performance of laser type InGaAs can be effective in the healing of these wounds. It can not, however, prove scientifically that the wavelength is the cause of such a response because the therapy with low power laser has not set parameters on the dose, wavelength and power to be used.

Impetigo

It is infection that attacks the skin surface, caused by the penetration of bacteria into the skin to open sores and itching. It can also be called pyoderm[10]. It is caused by *Staphylococcus* or *Streptococcus,* and is characterized by pustules. It can appear anywhere on the body but is most common on the face, arms and legs. May follow a minor trauma or disease that causes skin lesions such as mycosis, burns from the sun or insect bites.

The treatment is done with a topical antibiotic, with aseptic removal of crusts and compresses with antiseptic. In more extensive cases, systemic antibiotic therapy is indicated[10].

FINAL

The skin care of obese patients deserve special attention, mainly because of the difficulty in wound healing. Still, the increased risk of skin infections and lymphedema seen in these patients, contribute to greater morbidity in this population. In hospitalized patients, obesity leads to increased risk of pressure ulcers, besides the delay in healing, and should be managed primarily with preventive measures.

There are skin diseases that occur predominantly after the treatment of obesity for bariatric surgery and others that manifest themselves differently than usual. In Brazil, despite the high prevalence of obesity, there are no studies on the prevalence of skin diseases in this subgroup of patients.

Therefore, since obesity is a common problem with many skin conditions associated with difficulties in management and in view of the paucity of available literature on the subject, there is the need to study the behavior of skin manifestations in this population.

Dermatofunctional therapy can follow dermatological obese patients; preventive care and treatment, pre-and postoperatively done, can bring aesthetic benefits in muscle tissue and sagging, cellulitis, stretch marks, among others, providing improvement in quality of life.

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