

Lipoedema and Overweight Leading to Generalised Oedema: A Case Report

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ABSTRACT

The aim of the case report was to discuss generalised oedema in a patient with lipoedema and obesity, describing a novel concept of a stage 0 lymphoedema that was denominated as subclinical systemic lymphoedema. A 35-year-old female patient reported to the clinic due to telangiectasia of the lower limbs and leg pain that increased in the heat and when she spend a lot of time in a standing position. The patient had a physical appearance of lipoedema involving the upper and lower limbs associated with a family history of lipoedema, Body Mass Index (BMI) of 33.9 kg/m². Bioelectrical impedance analysis demonstrated important changes in intracellular and extracellular water as well as in all limbs and the thorax beyond the limits of normality. The telangiectasia was treated with sclerotherapy and pateint was instructed to lose weight and perform physical activity.

Keywords: Lymphoedema, Subclinical, Systemic, Telangiectasia

CASE REPORT

A 35-year-old female patient reported with telangiectasia of the lower limbs and pain in the legs since more than two years and which increased in the heat and when she spend a lot of time in a standing position. During the physical examination, telangiectasia was detected in the lower limbs and was classified as Clinical, Aetiological, Anatomical and Pathological classification (CEAP) for venous disease [1]. The patient had a physical appearance of lipoedema involving the upper and lower limbs and associated with a family history of this physical characteristic. Her mother and sister were also suffering from same condition. Her Body Mass Index (BMI) was 33.9 kg/m². Bioelectrical impedance analysis demonstrated important changes in intracellular and extracellular water as well as in all limbs and the thorax beyond the limits of normality [Table/Fig-1]. She was instructed to lose weight and perform physical activity. The telangiectasia's were treated with sclerotherapy.

Variables	Total	Normal water values [§]	Total extracellular water/ Total body water ratio
Total intracellular water	21.1 L	16.8-20.6 L	-
Total extracellular water	13.0 L	10.4-12.6 L	-
Total extracellular water/ total body water ratio	0.79 L	0.36-0.39 L	-
Right arm	1.96 L	1.38-1.68 L	0.379 L limit (0.36-0.39 L)
Left arm	1.99 L	1.38-1.68 L	0.379 L limit (0.36-0.39 L)
Trunk	16.7 L	12.5-15.3 L	0.383 L limit (0.36-0.39 L)
Right leg	5.67 L	4.35-5.31L	0.386 L limit (0.36-0.39 L)
Left leg	5.33 L	4.35-5.31L	0.381L limit (0.36-0.39 L)

[Table/Fig-1]: Liquid in body and limbs and reference values.
§= Normal values are obtained from bioimpedance machine S10

DISCUSSION

Lipoedema was first described by Allen EV and Hines EA in 1940, defining the condition as abnormal adipose tissue deposition in the lower limbs without involvement of the feet that generally affects women with a family history of the disease [2]. Oedema, cutaneous hypothermia, changes in plantar support and a negative stemmer sign are some of the clinical characteristics of lipoedema [2]. Lymphostasis and fatty tissue necrosis are described as its physiopathological processes [3].

Obesity is a chronic public health problem that affects millions of individuals throughout the world. It is recognised as a heterogeneous condition, as individuals with a similar BMI may have different

metabolic and cardiovascular risks [4]. Lymphoedema is a clinical condition in which macromolecules accumulate in the interstitial space, resulting in the retention of fluids and causing a specific type of oedema [5]. The cause may be, primary, in which there is an abnormality in the lymphatic system since birth that may or may not progress to oedema throughout one's lifetime. In cases of secondary lymphoedema, the individual is born with no lymphatic problem, but harm to the system throughout his/her lifetime leads to deficient lymph formation or drainage. In such cases, lymphoedema may be secondary to filariasis, cancer, trauma or phlebolymphoedema [6].

Animal studies have shown that obesity is associated with changes in the lymphatic system, leading to impairment of the pumping mechanism, an inflammatory process as well as changes in capillary permeability and immunological defense. Moreover, a clinical study found an association between lower limb lymphoedema and obesity [7,8]. Bioelectrical impedance analysis has demonstrated that obese patients with lymphoedema exhibit intracellular and extracellular fluid as well as fluid in the limbs beyond the patterns of normality. In the clinical practice, when evaluating patients with lipoedema using bioelectrical impedance analysis, authors found that patients with overweight and obesity often exhibit this characteristic.

The present case report showed important changes in the amount of bodily fluid in a patient with lipoedema and obesity. This approach has not previously been described in the literature, but such changes have drawn attention in routine clinical evaluations of patients with lymphoedema, obesity and lipoedema.

The lymphatic system serves as a functional reserve of the venous system and oedema occurs when this functional reserve is surpassed. In the patient described herein, a generalised increase was found in intracellular and extracellular water as well as water in the upper and lower limbs and thorax, characterising generalised oedema, which we have denominated subclinical systemic lymphoedema. In this case, the entire body was compromised, but neither clinical lymphoedema nor the parameters of lymphoedema given by bioelectrical impedance analysis were detected. The patient did not report oedema in the limbs. Therefore, this lymphoedema can be classified as clinical stage 0, which is characterised by the identification of a lymphatic alteration with no clinical manifestation [4].

The physiopathological hypothesis of this oedema may involve two aspects: lipoedema and obesity. Lipoedema is associated with lymphostasis, but does not have the characteristic of the distribution of bodily fluids. With regard to obesity, animal studies have demonstrated that the progression of obesity is associated

with changes in the lymphatic system, affecting the lymph pumping mechanism, capillary permeability and immunological processes. Moreover, a clinical study has associated lower limb lymphoedema with obesity [9].

The changes in the lymphatic system related to obesity seen in animal studies are compatible with the fluid abnormalities found in the patient described herein. Changes in permeability can lead to greater flow in the interstitium and an overload of the lymphatic system, causing oedema. Changes in the pumping mechanism of the lymphatic system lead to mechanical deficiency. Therefore, these are two mechanisms that compromise the lymphatic system [5,6]. This new concept paves the way for a new line of investigation of lipoedema, in which the identification of subclinical systemic oedema should be considered as contributing to the aggravation of the oedema [9]. As different clinical stages are identified in the evaluation of these patients, further studies are needed.

CONCLUSION(S)

Lipoedema and overweight may present generalised oedema, identifying a novel type of lymphoedema classified as clinical stage 0 and denominated subclinical systemic lymphoedema.

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