

Neuropathic Pain in Obese Patients: Prevalence and Impact on Quality of Life

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Abstract

Original Research Article

Obesity is associated with increased sensitivity to pain, including neuropathic pain (DN). The objective of this study is to determine the prevalence of DN in obese patients, to assess its impact on the quality of life and to identify the factors associated with it. This is a prospective and descriptive study conducted over a period of 4 months. All patients with BMI over 30 kg/m², non-diabetics were included. The evaluation of neuropathic pain was made by the DN4 score. The visual pain scale was calculated. Quality of life was assessed using the SF-12 score. Statistical analysis was performed using SPSS 26. A total of 111 patients were included. The average age was 44.79 years old. The majority were women. The average BMI was 38.69 kg/m². The prevalence of neuropathic pain was 59.1%. The average VAS was 4.32. Physical quality of life was impaired in 66.7% of patients and 71.4% had an impairment of mental life. In univariate analysis, neuropathic pain was more common in women, in older subjects, in cases of prediabetes, in cases of vitamin D deficiency and in patients with impaired physical and mental quality of life. The Spearman correlation study had shown that the DN4 Score was positively correlated with pain VAS, and negatively correlated with physical quality of life and mental quality of life. DN is common in obese patients. It is responsible for a significant impact on the quality of life, hence the importance of detecting and treating it.

Keywords: Obese, Neuropathic pain, DN4, VAS, quality of life.

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INTRODUCTION

Obesity is associated with an increased sensitivity to pain, the association with several painful conditions has been proven including low back pain, tension or migraine, fibromyalgia, abdominal pain. Studies have shown that the relationship is not simply a mechanical overload but several factors may intervene including hence the emergence of several pathophysiological hypotheses [1]. Obesity is a risk factor for several serious diseases and it also has a negative impact on quality of life, The presence of DN during obesity worsens the impact on quality of life [2]. The aim of this study is to determine the prevalence of DN in obese patients, to assess its impact on quality of life and to identify associated factors.

MATERIALS AND METHODS

This is a prospective cross-sectional analytical study conducted over a 4-month period between March 2022 and July 2022. All patients over 18 years old, with

BMI over 30kg/m², without diabetes were included. Exclusion criteria were children and patients with diabetes. Sociodemographic data were collected. Anthropometric parameters were measured. A biological assessment was performed, including a lipid and phosphocalcic profile and an HBA1C. Neuropathic pain was evaluated using the DN4 score and the visual pain scale (VPS) was calculated. The evaluation of the quality of life was done by the SF-12 score. Statistical analysis was done by SPSS 26 software. Qualitative variables were analyzed by the KHI2 test, and quantitative variables by the Student's t test. P values lower than 0.05 were considered significant.

RESULTS

A total of 111 patients were included. The mean age was 44.79± 14.75 years. The majority were women (91%). The mean BMI was 38.69±5.67 kg/m². The mean abdominal waist circumference was 116.64±15 cm. Obesity was common in 57.3% of patients. The secondary etiologies were, cushing's

syndrome (53.18%), hypothyroidism (23.4%), long-term Corticosteroid therapy (21.27%), and PCOS (2.12%). The mean duration of evolution was

16.39±10.65 years. Obesity was morbid in 44.4% of patients.

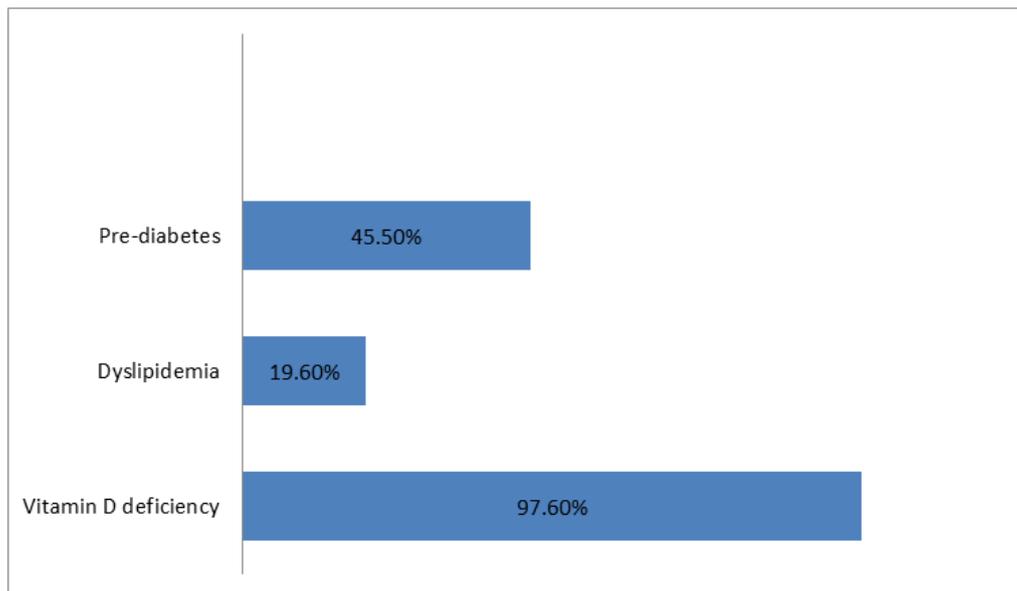


Figure 1: The different biological anomalies found in our obese patients

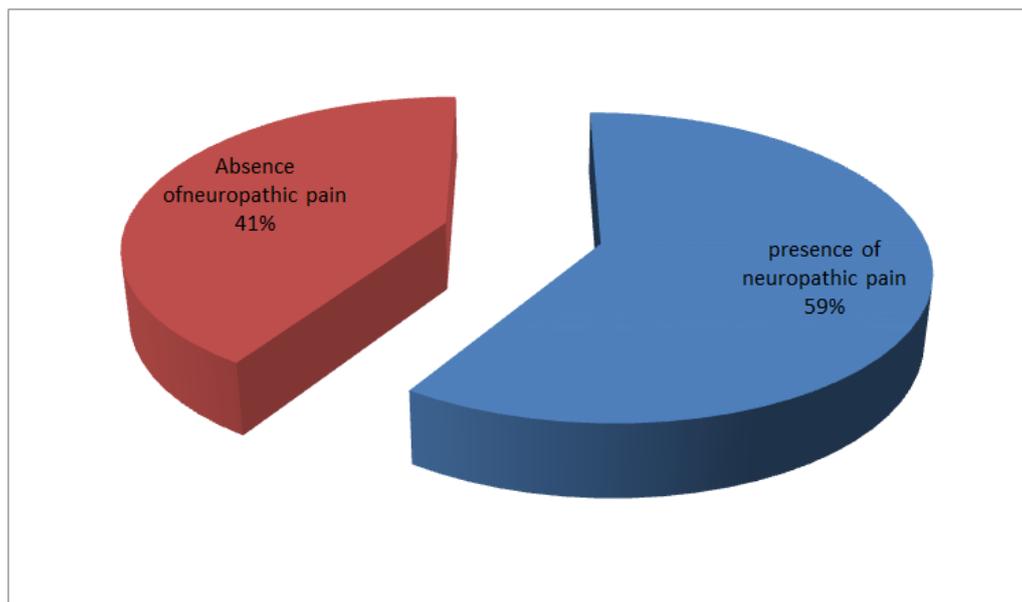


Figure 2: The prevalence of neuropathic pain in obese patients

The mean VAS was 4.32±3.5. Physical quality of life was impaired in 66.7% of patients and 71.4% had mental impairment.

In univariate analysis, neuropathic pain was more frequent in women, in older subjects, in cases of prediabetes, in cases of vitamin D deficiency and in patients with impaired physical and mental quality of life.

The Spearman correlation study showed that the DN4 Score was positively correlated with pain VAS

($P=0.000$, $r=0.819$), and negatively correlated with physical quality of life ($P=0.005$, $r=-0.526$) and mental quality of life ($p=0.000$; $r=-0.366$).

In multivariate analysis, DN was associated with impaired physical quality of life ($p=0.01$; 95% CI: 0.01-0.547) but not mental quality of life ($p=0.198$; 95% CI: 0.028-2.089).

DISCUSSION

Obesity is defined as a multifactorial, chronic and progressive neurobehavioral disease, an increase in

body fat mass promotes adipose tissue dysfunction, leading to adverse metabolic, biomechanical and psychosocial consequences. Obesity is assessed by analyzing two parameters: body mass index (BMI), which correlates with excess body fat, and waist circumference, which correlates with abdominal fat tissue. Obesity is defined by a BMI greater than 30 kg/m² and its abdominal form by a waist circumference greater than 102 cm in men and 88 cm in women. Obesity is a major public health problem, its prevalence is 12% in adults aged 18 years or older in 2015 [4, 5].

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, it can be caused by a variety of physical and/or psychological factors, which are classified as nociceptive, neuropathic, or a combination of both [6].

The Gallup organization conducted a proprietary survey between 2008 and 2010 of 1,062,271 people, the survey questions included height and weight, from which BMI was calculated, questions about pain experienced in the past year, and a question about pain experience yesterday, 19.2% of the sample were classified as normal BMI and the rest were obese, when demographic variables were controlled for: the obese group reported 20% higher pain rates than the normal BMI group [1], Callaghan *et al.*, proved by a study conducted in 102 diabetic and non-diabetic patients that DN is frequent in obese people even in the absence of hyperglycemia [7], The frequency of neuropathic pain was more frequent in elderly patients with dyslipidemia [1, 7, 9]. In our study, the prevalence of neuropathic pain in obese patients was 59.1%, more frequent in women, in older subjects, in cases of pre-diabetes, in cases of vitamin D deficiency.

Several pathophysiological hypotheses have been suggested to explain the frequency of neuropathic pain in obese patients, including an increase in pro-inflammatory cytokines and a decrease in anti-inflammatory cytokine secretion by adipose tissue, This can lead to increased levels of pro-inflammatory cytokines (i.e. TNF-alpha and interleukin-6) and to systemic inflammation that can lead to peripheral and central sensitization in the pain transmission system and result in hyperalgesia and allodynia and reinforcing the paroxysmal and negative symptoms of neuropathic pain [8, 10].

Obesity and pain are two public health problems in our society. Several studies have shown a linear increase in chronic pain as a function of BMI and a higher frequency of DN in obese patients secondary to an increase in pro-inflammatory cytokines and a decrease in the secretion of anti-inflammatory cytokines by the adipose tissue at the origin of a systemic inflammation responsible for an increase in peripheral and central sensitization In our study the prevalence of DN was 59.1%.

Obesity is associated with a decrease in functional health status and subjective well-being. Barofsky I *et al* conducted a study in 312 patients followed for obesity, they evaluated the impact of pain on quality of life using the Medical Outcomes Study Short Form 36 (SF-36), the results found that pain itself was independently associated with impaired HRQoL in almost half of the obese individuals [3, 11, 12]. In our study the presence of neuropathic pain was positively correlated with VAS pain and negatively correlated with physical and mental quality of life score.

CONCLUSION

We conclude that there is an association between obesity and neuropathic pain, which is consistent with the results of previous clinical studies. It is responsible for a significant impact on the quality of life, hence the importance of detecting and treating it.

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