Original Article

OBESITY AND LOW BACK PAIN IN POSTMENOPAUSAL WOMEN

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Summary

Both low back pain (LBP) and obesity are common public health problems, yet the relationship between them remains controversial. Twice as many postmenopausal women suffer from LBP,as compared to pre-menopausal women. AIM: To investigate the association between body mass index (BMI) and the prevalence of LBP in postmenopausal women, aged 51-63 years who have sought help from their GPs in Pleven and the specialized clinics of the University Hospital Stara Zagora. METHODS: Chronic pain patients were divided into three weight categories, based on body mass index (BMI): normal (BMI < 25 kg/m^2), overweight (BMI between 25 kg/m^2 and 30 kg/m^2), and obese (BMI > or = 30 kg/m^2). The data collected included socio-demographic characteristics, anthropometric measurements, LBP, medical and reproductive history, health status and menopausal status. The women completed questionnaires designed to measure pain severity. RESULTS: 23.7% of the investigated women reported chronic LBP and 73.5% of these women were obese and overweight. For menopausal women, among all weight-related factors, only waist circumference and waist-to-hip ratio were related to LBP. CONCLUSIONS: Obese postmenopausal women often suffer from LBP. We found that in a population of postmenopausal women the abdominal obesity might increase the risk of LBP.

Key words: obesity, low back pain, postmenopausal women, waist-hip ratio, body mass index

Introduction

Low back pain (LBP) is one of the most common problems nowadays. Obesity, together with overweight, which means a higher body mass index (BMI), correlate with worsening of life-quality and muscle-skeleton functioning. Obese people often look for medical help in relation to their complaints of back muscle pains [1]. Based on such data, many authors draw the conclusion that there is a correlation between obesity and low back pain/overweight [1, 2, 3, 4]. This problem becomes even more pronounced in postmenopausal women [5, 6]. During this period of women's life, the likelihood of increasing the weight and manifestation of LBP increases due to the changes of

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the muscles and skeleton structures as a result of ageing, occupational or other factors. Despite the massive research on the topic, this correlation is still vague. On the other hand, the correlation between body fat and low back pain has been even less explored and documented. It may be assumed, however, that the people who maintain higher levels of body fat in the abdominal area for longer periods are exposed to a higher risk of LBP resulting from the altered posture aiming at balancing the abdominal fat mass.

The intervertebral disk prolapse is more commonly seen in tall people. Height seems to correlate with back pain, irrespective of fat mass size in the abdominal area [7]. These people make more effort to withstand gravitation that applies force at the fat masses to achieve balance, especially when going up or down stairways. As a result, they experience more pressure on the lower back. The same hypothesis may be applied to people with central distribution of fat, taking into consideration the waist-to-hip ratio. Such a high indication could lead to a higher risk of back pain independently of BMI [1, 8].

The aim of the study was to investigate the correlation between obesity indices such as BMI, waist and hip circumference, waist-to-hip ratio, and LBP in postmenopausal women.

Subjects and Methods

Materials / Patients

Two hundred and eighty three postmenopausal women were investigated (age range 51 – 63) using interviews and a detailed analysis of their medical documentation. There were also 68 women (which represented 23.7% of all the participants) with documented LBP treated by general practitioners in the Pleven and Stara Zagora university hospitals (Table 1).

Table 1. Characteristics of 283 postmenopausal women

Variables	average	sd	range
Age	56.9	5.0	51.2-63.0
Weight	78.5	11.5	56.2-153.0
Height	165.7	6.7	144.5-182.1
BMI	25.0	4.2	16.9-58.3
Waist circumference	81.1	11.1	66.5-150.0
Hip circumference	102.2	8.4	86.4-165.0
Waist-to-hip ratio	0.791	0.070	0.567-1.302

There were 3 groups of postmenopausal women with back pain according to their BMI:

I. With normal weight (BMI<25 kg/m^2) n = 18
II. Overweight (BMI between 25 kg/m^2 and 30 kg/m^2) n = 24
III. Obesity (BMI ≥30 kg/m^2) n= 26

After a detailed analysis of the medical documentation including a clinical, neurological and gynecological status, the participants were asked to fill in a questionnaire including questions about their socio-demographic characteristics (age, marital status, occupation etc.) and a scale for subjective estimate of the pain intensity - Visual Analog Scale (VAS) which is a self- estimate of the pain, choosing a point on a 10 cm line between the definitions “no pain” and “the pain could not be stronger” [9]. The LBP symptoms were estimated by a self-estimation questionnaire. The subjects were asked questions about the duration of the LBP during the last 12 months. Those who had had LBP for 12 weeks or more were classified as suffering from chronic back pain. The rest of the subjects were referred as controls with episodic back pain.

Anthropomorphic measurements were done on all the subjects according to the recommendations of the World Health Organization [10]:

Body Mass (in kg)
Height (in cm)
Body Mass Index (BMI in кg/m^2).
Waist circumference (abdominal obesity ≥ 80 cm)
Hips circumference
Waist-to-hip ratio (obesity ≥0.8).

The following statistical methods were used when dealing with the data – t-tests, factor and correlation analyses (SPSS).

Results

Significant differences were found between the two groups. The subjects with chronic back pain reported a higher intensity of the pain ($t=2.34$; $p<0.05$) (Fig.1).

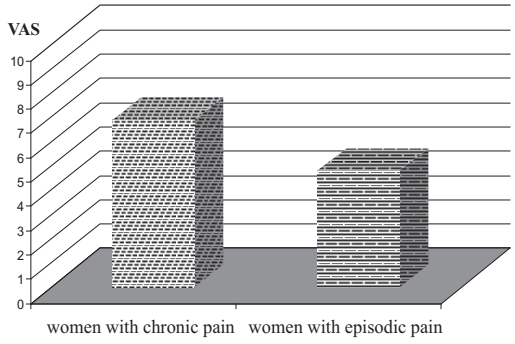

Figure 1. Intensity of low back pain in women with chronic and episodic pain

Influence in the BMI on the pain intensity

Results of the one-factor dispersion analysis: when comparing the three groups of women according to their BMI and the subjective estimate of the pain intensity, significant differences were also found ($F=2.86$; $p<0.05$) (Fig. 2).

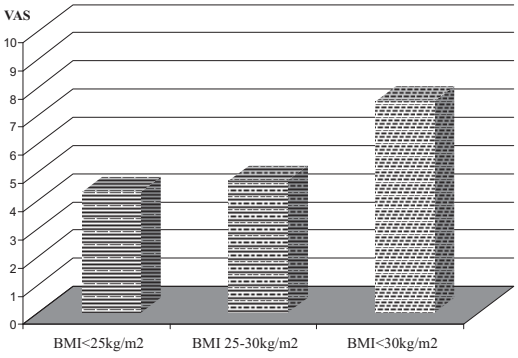

Figure 2. Differences in the subjective estimate of the intensity of low back pain in women with chronic and episodic pain

Influence of the anthropomorphic data on the intensity and type of pain

The correlation analysis performed revealed a significant positive correlation between the duration of the pain (chronic and episodic) and the waist circumference ($r=0.41$; $p<0.05$), and the waist-to-hip ratio ($r=0.37$; $p<0.05$) but not with the BMI. This result shows that when waist circumference and the waist-to-hip ratio increase, the duration of pain increases, as well as the probability that the pain to become chronic.

Discussion

The data on the prevalence of the LBP in the postmenopausal women showed that 23.7% of them experienced pain of varying intensity and duration. This result shows that in this age group the LBP is a serious and common problem, independent of its intensity and character. Having in mind our investigation and the fact that 73.5% of the women investigated were obese and overweight, we can assume that menopausal women suffering from obesity often have LBP.

The results from the subjective pain estimate also showed that the menopausal women reported chronic back pain was intense, rather than episodic (Fig. 1). On the other hand, taking into consideration the fact that obese women suffer from more intense pain (Fig. 2), it could be stipulated that the mechanism of the pain is statogravitational because of the greater pressure on the lower spine, associated with increased abdominal fat tissue. This hypothesis is confirmed by the results pointing out that the duration and type of back pain in postmenopausal women correlated with the anthropometric indexes of the type of obesity (the fat tissue accumulation in the abdominal area). Apparently, obesity reduction, especially in the abdominal area would significantly improve the quality of life of these women.

Conclusions

Obese postmenopausal women often suffer from LBP.

The intensity of the pain in postmenopausal women depends on their BMI, and the duration and the type depend on the obesity spots. Chronic pains in the back seem to appear due to the statogravitational mechanism exercising a higher pressure on the lower part of the spine due to an increased abdominal mass of fat tissue- with higher estimates of the hip and waist circumferences, as well as the waist-to-hip ratio.

The reduction of obesity and especially in the abdominal area fat tissue would significantly improve the quality of life of these women.

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