Available online at www.sciencedirect.com

ScienceDirect

journal homepage: http://www.elsevier.com/locate/pjnns

Original research article

Body mass index and its impact on migraine prevalence and severity in female patients: Preliminary results

Kamil Chorążka, Marlena Janoska, Izabela Domitrz *

Department of Neurology, Medical University, Warsaw, Poland

ARTICLE INFO

Article history:
Received 29 March 2014
Accepted 31 March 2014
Available online 8 April 2014

Keywords:
Migraine
Body mass index
Obesity
Cardiovascular diseases

ABSTRACT

Background and purpose: A strikingly increasing number of obese patients causes a great interest in potential medical problems resulting from abnormal body weight. Many conditions are associated with obesity. The severity and risk of migraine may be connected with a body weight. We would like to assess a correlation between body mass index (BMI) and frequency and duration of migraine.

Materials and methods: We collected data of 53 female patients with migraine and 36 healthy persons (25 women) as a control group. Mean duration of migraine attacks and their mean frequency were based on patients' diaries. The patients reported their height. Weight was measured by the authors. We consequently calculated BMI and performed statistics on SAS 9.2.

Results: The mean BMI of the migraine group was 24.27 ± 4.47. Forty-nine percent of patients had normal BMI (18.5–25), 30% patients were overweight (>25) and 13% were obese (>30). The mean BMI among controls was 22.69 ± 2.96. Eighty-four percent of the control group had normal BMI, 12% was overweight and 5% was obese. An association of BMI in women with frequency of migraine episodes per month occurred remarkable when adjusted for age. Difference of a mean BMI value between the migraine and the control group was nearly statistically significant. Body mass index and duration of the episodes revealed similarly strong correlation.

Conclusions: Increased BMI correlates with frequency of migraine. Its influence on a risk of the headaches and their duration remains to be specified.

1. Introduction

Abnormally increased body mass index (BMI) (overweight and obesity) becomes currently more and more common in a human population. This so-called plague of the 21st century is already described as a disease of affluence [1–3]. Obesity seems to be a risk factor of several conditions, especially cardiovascular diseases, diabetes, dyslipidaemia and joint problems. As

* *Corresponding author at*: Department of Neurology, Medical University, Banacha 1a, 02-097 Warsaw, Poland. Tel.: +48 22 599 28 57; fax: +48 22 599 18 57.
E-mail addresses: izabela.domitrz@wum.edu.pl, idomitrz@wum.edu.pl (I. Domitrz).

http://dx.doi.org/10.1016/j.pjnns.2014.03.003

a matter of fact, some recent studies prove that migraine may be associated with BMI as well.

Migraine is a frequent and disabling neurological illness and the common type of headaches encountered especially in women. Recently, migraine is thought to be a risk factor of cardiovascular conditions, like myocardial infarction, stroke, and coronary disease [4–8]. Thus, its correlation with abnormal BMI attracts even more attention of scientists.

Indeed, the review of the literature indicates that there is a relation between a BMI value and a more severe course of migraine [9,10]. Besides, some papers show a higher risk of migraine in the overweight or the obese subjects [11–15]. The other research suggests that frequency of such migraine features, as well as sensitivity to sound and light is significantly associated with a higher BMI value [9,16]. On the contrary, some authors conclude that migraine patients with low BMI are also more likely to have an increased risk for migraine [13,17]. Interestingly, other authors indicate that there is no correlation between BMI and frequency of migraine attacks [18,19]. According to the mentioned information we would like to discuss abnormal BMI and obesity as potential factors aggravating a course of migraine and confront our results with the newest views on the topic.

2. Materials and methods

We collected randomly data of 53 adults female with migraine with no long-term drug management (only acute medications 3 days before consultation or earlier) and 36 patients with no medical history or drug management (25 women and 11 men) as a control group (with a mean age of 41.88 ± 12.37 years). Patients were interviewed and examined in the Outpatient Headache Clinic of the Medical University of Warsaw from November 2010 to February 2012. All of our patients were diagnosed with migraine according to the International Headache Society (IHS) criteria, second edition [20]. Selection of individuals to the groups and statistics were performed by different members of the research team.

The mean age of the migraine group was 43.4 ± 10.9 years (range: 22–63 years). The mean frequency of migraine attacks per month was 4.0 ± 5.6, mean duration of migraine attacks was 51.2 ± 45.2 h. The control group participants reported their height and weight filling out a survey. The interview contained such information as type of migraine, frequency of migraine attacks, duration of the disease, medications, cigarette smoking. Mean duration of migraine attacks and their mean frequency were obtained from the mean number of migraine episodes within three months before consultation. These data were systematically noted in the patients' diaries. During the first consultation patients reported their height, weight was measured by the authors of the project and consequently BMI was calculated by dividing weight in kilograms by the square of height in meters.

The statistical analysis was carried out using SAS 9.2. The comparison of BMI in the migraine group and the control group was done. p-Values of <0.05 were considered statistically significant. We also assessed the association between BMI and frequency of migraine attacks and their duration. We took advantage of the age-adjusted logistic regression models.

3. Results

The mean BMI of the migraine group was 24.27 ± 4.47 (range: 17.24–34.82). Twenty-six patients (49%) had normal BMI (18.5–25), 16 patients (30%) were overweight (BMI >25) and 7 (13%) were obese (BMI >30). 4 patients (7%) were underweight (BMI < 18.5). The mean BMI of the controls was 22.69 ± 2.96 (range: 18.06–40.61). Twenty-one persons had a normal BMI value (84%), 3 (12%) were overweight and one was obese (5%). In the control group only women were considered as well.

An association of BMI in women with frequency of migraine episodes per month occurred remarkable when adjusted for age ($p = 0.0421$, $r = 0.29$). Comparing BMI in women with mean frequency of migraine attacks in the same age groups brought a noteworthy relation between the studied parameters indicating an impact of BMI on frequency on the attacks

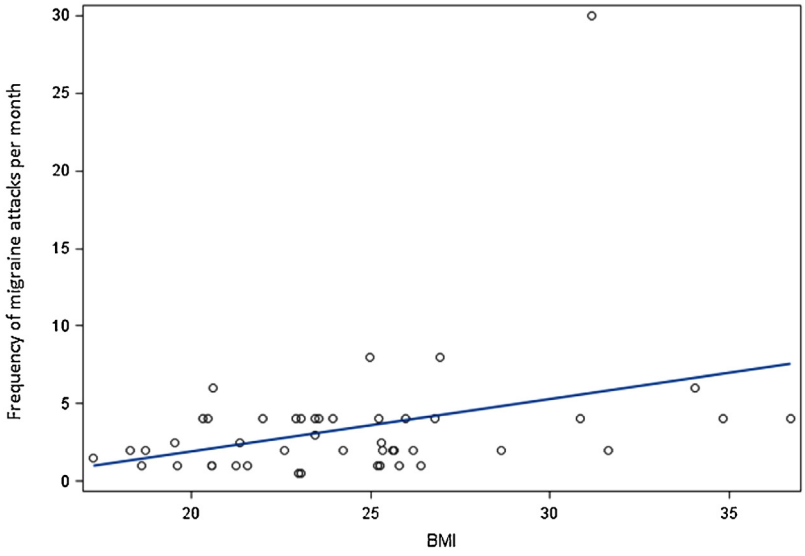

Fig. 1 – A linear correlation between a body mass index (BMI) value and frequency of migraine attacks per month.