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The impact of obesity on the clinical features of migraine: a systematic review

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Introduction
Migraine, a highly prevalent headache disorder, is strongly associated with obesity in the literature. However, its impact on clinical features remains a topic that requires further investigation.

Objective
To evaluate the impact of obesity on migraine clinical features.

Methods
This systematic review was conducted using the PICO strategy and according to the PRISMA guidelines. A search was conducted for studies published in the last 5 years in English, Portuguese, and Spanish in PubMed, Scopus, and Embase databases using the MeSH terms Obesity and Migraine Disorders combined with the Boolean operator "AND". 1,323 studies were identified and underwent double independent screening. Inclusion criteria were studies evaluating the impact of obesity on at least one of the following: attack frequency, pain severity, attack duration, or migraine chronification; observational studies and randomized clinical trials. Exclusion criteria were studies that did not specifically evaluate patients with obesity and/or migraine, resulting in 10 articles for data extraction.

Results
Class 3 obesity was related to a higher migraine headache index ($p=0.01$) and number of migraines per month ($p = 0.007$) when compared to healthy-weight controls. A relationship was found between body mass index (BMI), body fat percentage and migraine frequency ($p<0.05$; $p<0.017$); those with higher frequency had higher BMI ($p=0.018$). Waist circumference (WC) demonstrated an association with intensity ($p = 0.028$) and use of prophylactic medication ($p=0.017$). There was an association between higher follow-up weight, WC gains and increased headache burden ($p=0.05$), suggesting a cumulative or mediating role of obesity over time and supporting the link between weight gain and migraine progression. Migraineurs for more than 10 years had higher body weight ($p=0.012$), WC ($p=0.005$), and BMI ($p=0.019$) compared to those for 1 to 5 years, suggesting an impact on disease duration, with high body fat increasing the risk of chronic migraine by 2.8 times ($p<0.003$). Higher BMI was associated with medication overuse ($p=0.015$), especially in obese patients when compared with eutrophic or overweight individuals, presenting nearly twice the odds ($p=0.009$). These findings may suggest that obesity and the pro-inflammatory state caused by fat accumulation contribute to central sensitization, which is associated with an increased frequency of migraine attacks, possibly leading to medication overuse. Two studies did not find an association between obesity and migraine features, especially in groups with non-morbidly obese patients.

Conclusion
Obesity, particularly class 3, has an impact on migraine clinical features, especially regarding attack frequency, chronification and medication overuse. WC and body fat percentage also have an impact on migraine burden, including intensity and duration. Longitudinal and larger studies are needed to better understand this relation.

Keywords:
Migraine
Pathophysiology
Clinical features
Obesity

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