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Bariatric Surgery as a Complementary Treatment in Patients with Idiopathic Pseudotumor Cerebri: an Overview

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Abstract

Idiopathic Intracranial Hypertension (IIH), also known as pseudotumor cerebri, is a syndrome characterized by an increase in intracranial pressure of unknown cause, leading to headaches, frequently in the morning, progressive vision loss, papilledema, pulsatile tinnitus, and in most cases, regular cerebrospinal fluid studies. The most robust and consistent risk factors occur in female patients of reproductive age and those with obesity. This condition in recent years has increased in reported cases due to an escalation in the rate of obesity and unhealthy lifestyles. Currently, there are varying therapeutic options for primary and secondary PTC patients. The first line of therapy includes weight loss and medications such as Acetazolamide, Topiramate. Although corticosteroids have previously been used, they are not recommended due to the risk of weight gain and therefore worsening the symptoms of intracranial hypertension in these patients.

The risk of IIH and visual disturbances increases as BMI does, so weight loss is critical in management regardless of the approach used. Lifestyle modifications such as dietary modifications and exercise promotion are widely used as weight reduction measures, but recent research indicates that long-term weight control under these measures is suboptimal. Alternative management for patients who fail to achieve a good weight and maintain it, bariatric surgery is a viable option. Patients managed with bariatric surgery is associated with long-term sustained weight and improved quality of life. In addition, recently published studies have shown that bariatric surgery helps considerably improve outcomes, ameliorate IIH symptomatology, glycemic control, and reduce cardiovascular and cancer risk.

Keywords: Idiopathic intracranial hypertension, pseudotumor cerebri syndrome, benign intracranial hypertension, papilledema, headache, obesity, weight loss, Bariatric surgery

Abbreviations: PTC: Pseudotumor Cerebri; IIH: Idiopathic Intracranial Hypertension; BMI: Body Mass Index; CSF: Cerebral Spinal Fluid

Introduction

Pseudotumor cerebri, also recognized as idiopathic intracranial hypertension, is a disorder with a benign increase in the intracranial pressure without a mass lesion, underlying malignancy, hemorrhage, or infection. It mainly affects overweight

women with more than 20% of ideal body weight in reproductive age. This condition is associated with severe headaches frequently in the morning, progressive vision loss, papilledema, pulsatile tinnitus, and in most cases, regular cerebrospinal fluid studies [1]. According to the American Academy of Neurology, in 2020, there has been a significant increase of 87% in the incidence of cases of Idiopathic intracranial hypertension compared with the number of cases seen in 2003. This increment is associated with an increased obesity rate and unhealthy lifestyles [2]. Management involves medications that reduced the volume of cerebrospinal fluid, such as carbonic anhydrase inhibitor (Acetazolamide) or the reduction of overall body fluids, such as loop and thiazides class diuretics (Furosemide, chlorthalidone, respectively). Recent studies have demonstrated the importance of Bariatric surgery as a critical component in the long-term management of the IIH [1].

Over 90% of IIH patients are obese or overweight. The risk of IIH increases as the function of Body Mass Index (BMI) and weight gain increase over the preceding year. The risk of IIH-induced vision loss also increases with increasing BMI, especially with BMI >40 kg/m^2. Several mechanisms that link obesity to the development of IIH have been proposed. However, the pathophysiology remains unknown [3,4]. Published studies and clinical observations strongly support weight loss, whether non-surgical or surgical, as an effective treatment [3]. Although lifestyle-directed to weight-loss interventions, including exercise promotion and dietary changes, are broadly advised, long-term weight control and IIH outcomes remain suboptimal [4]. Bariatric surgery is an alternative to reducing excess weight and IIH symptomatology [5]. It also improves glycemic control and cardiovascular and cancer risk [6]. A previous review of 65 patients demonstrated that 92% (60/65) improved in IIH outcomes [7]. Although there is evidence that suggests non-surgical interventions, including a recent multicenter RCT of weight loss vs. weight loss with Acetazolamide [8], may improve IIH outcomes via weight reduction and possibly additional mechanisms. There is a lack of studies directly comparing these treatment strategies.

Management of pseudotumor Cerebri (PTC) has proven to reduce the risk of long-term sequelae. Although there are different therapeutic options for PTC, weight loss and medications remain the first line of therapy in primary and secondary PTC. Studies have demonstrated an improvement in visual fields and papilledema with a decrease in body weight. The benefit of weight loss in patients with PTC was evident through a prospective cohort trial that included 25 women with chronic PTC. For three months, these women participated in an observational control period, and after this period, they were placed on a low-calorie diet (425 kcal per day) for three months. While on a diet, the patients lost 15% of their body weight and experienced a decrease in intracranial pressure, cephalea, papilledema [9]. Being a carbonic anhydrase inhibitor, Acetazolamide exerts its effect by decreasing cerebral spinal fluid (CSF) production, being the medication of choice for patients with PTC. The initial dose is 500 mg BID with increases up to 4 g per day as appropriate. Topiramate has also proven helpful as it has both mild carbonic anhydrase activity and preventive treatment for migraine headaches. However, this medication has side effects of weight loss, which can be beneficial for patients with obesity. Although corticosteroids have been used in some cases, they should be avoided because of the risk of weight gain and rebound intracranial hypertension upon withdrawal. Bariatric surgery is another option associated with improving idiopathic intracranial pressure and its symptomatology for patients who cannot lose weight simply through lifestyle modifications and medication use [10].

Following lifestyle modifications, people tend to regain weight after some time leading to an exacerbation of PTC symptoms. However, bariatric surgery has been associated with long-term sustained weight and improved quality of life in twelve months. The reduction of weight and decrease in symptoms is supported by Manfield et al. showing a complete resolution of papilledema and reduction in headache symptoms in 65 patients with a mean BMI of 48.3 before surgery and a mean decrease of BMI by 17.5kg/m^2 [11,12]. A five-year clinical trial demonstrated better quality of life at two years in patients with bariatric surgery and reduced intracranial pressure [11]. In a systematic review done by Warren et al., 35 patients reported improvements in symptoms such as headaches at a three-month and three-year postoperative follow-up. A decrease in weight has shown improvement and, in some cases, a complete resolution not only of symptoms, but also the long-term quality of life. Bariatric surgery has demonstrated a better long-term weight and a better control of symptoms and intracranial pressure along with metabolic improvement [13].

Conclusion

Pseudotumor cerebri (PTC) is a benign increase in intracranial pressure commonly seen in childbearing women and frequently associated with an increase in the BMI. Although the exact mechanism that links obesity with the development of PTC remains unknown, it has been associated with diminished absorption or excessive production of cerebrospinal fluid in those patients. Nowadays, this disorder has increased its incidence, and in the last few decades, symptoms, such as intense headaches, vision changes, and pulsatile tinnitus are a common cause of consultation in the Neurology office.

Different therapeutic options are available to manage the symptomatology, including weight loss measures, exercising and implementing a healthier lifestyle can be considered as a first-line treatment. Medications like Acetazolamide, a diuretic that exerts the effect in the reduction of the cerebral spinal fluid, can alleviate the symptoms in a short-term period. While on a diet, the reduction of body weight is not enough to eradicate the problem, the importance of bariatric surgery as long-term management for these conditions began to take place. This intervention not only helps the patient to decrease weight permanently, but also it has a positive impact in the improvement of other conditions, such as cardiovascular, metabolic, and cancer-related diseases.

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Furthermore, this is a perfect option for patients suffering from a benign increase in intracranial pressure. For this reason, more evidence and high-quality clinical trials about the participation of bariatric surgery as a critical role in the long-term management of Pseudotumor cerebri are needed.

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