Association of the Amount of Weight Lost After Bariatric Surgery With Intracranial Pressure in Women With Idiopathic Intracranial Hypertension

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Study Question
How much weight loss is required to reduce intracranial pressure in women with idiopathic intracranial hypertension?

What Is Known and What This Paper Adds
The amount of weight loss required to reduce intracranial pressure in patients with idiopathic intracranial hypertension is unknown, and this is a gap in knowledge with direct clinical relevance. This study’s results show that the greater the weight loss, the greater the reduction in intracranial pressure, and that 24% weight loss was associated with disease remission (lumbar puncture opening pressure ≤ 25 cm H2O). Such magnitude of weight loss was unlikely to be achieved without bariatric surgery. This study provides Class II evidence that weight loss after bariatric surgery results in reduction in intracranial pressure in adult women with idiopathic intracranial hypertension. This study is Class II because of the use of a per-protocol analysis.

Methods
The idiopathic intracranial hypertension randomized controlled weight trial included adult women with active idiopathic intracranial hypertension and a body mass index of ≥ 35 kg/m². Sixty-six women were randomized to either the bariatric surgery pathway (n = 33) or the community weight management intervention (diet, n = 33). At 12 months, 23 women had received bariatric surgery. The choice of surgery type was a pragmatic approach that allowed the individual participant to choose with their surgeon and included Roux-en-Y gastric bypass (n = 13), laparoscopic gastric band (n = 6), and laparoscopic sleeve gastrectomy (n = 4). This per-protocol analysis evaluated the relationship between intracranial pressure, weight loss, and the weight loss methods. A linear hierarchical regression model was used to fit the trial outcomes, adjusted for time, treatment arm, and weight.

Results and Study Limitations
Weight loss was associated with reduction in intracranial pressure ($R^2 = 0.4734$, $p \leq 0.0001$). Twenty-four percent weight loss (mean weight loss 13.3 kg [SD 1.76]) was associated with disease remission. Those with a higher starting weight needed to lose more weight to meaningfully reduce intracranial pressure. The model constructed demonstrated that in the diet group if no or little weight loss was achieved in those with a high baseline weight, an increase in intracranial pressure would be expected. Although the numbers in each bariatric surgery type were small, the Roux-en-Y gastric bypass achieved greater, more rapid, and sustained ICP reduction compared with the other methods. Limitations of this study include the use of a per-protocol analysis and a potential confounder that those who did not proceed with bariatric surgery were using the hospital weight management advice as compared to those in the diet arm who received weight watchers.

Registration, Study Funding, and Competing Interests
Trial registration: ClinicalTrials.gov Identifier: NCT02124486; ISRCTN registry number ISRCTN40152829. This study was funded by the NIHR. Some authors report competing interests. Go to Neurology.org/N for full disclosures.

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