Effect of Vagal Nerve Stimulation on Weight Loss

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Disclosure

The authors report no conflict of interest concerning the materials or methods used in this study or the findings specified in this paper.
Introduction

Vagal nerve stimulation (VNS) is a widely accepted treatment for medically refractory epilepsy. Previous studies have reported weight loss side effects among their patients with VNS. The mechanism is thought to occur secondary to an increase in vagal tone at the end organ level, a well-known factor for satiety. However, other studies have published conflicting data without report of weight loss. We provide further retrospective review of weight loss in patients undergoing VNS placement as previous data have been limited by sample size, the largest being 32 subjects.
Methods

We conducted a retrospective review of 174 patients who underwent VNS placement for medically refractory epilepsy. Patient data including age, weight, height, body mass index (BMI), VNS model, VNS settings, medications, comorbidities, and gastrointestinal side effects were obtained at the time of stimulator placement and last follow up. Last follow up occurred at a mean of 18 +/- 14 months (mean +/- SD).
Results

Average BMI at the time of stimulator placement and last follow up was 28.3 kg/m² (95% CI 27.2-29.2) and 28.6 kg/m² (95% CI 27.6-29.6), respectively. Linear regression analysis did not show any correlation between change in BMI and age, sex, length of follow up, stimulator setting, gastrointestinal side effects, or initial BMI. The most common gastrointestinal side effect among our patient population was gastroesophageal reflux disease (n=14), which did not subjectively worsen throughout follow up.
Discussion

Vagal nerve stimulation has long been studied with concern for gastrointestinal side effects. Dyspepsia has been reported by Handforth et al. to occur in 17% of patients without a significant difference between high and low frequency stimulation.³ In addition, gastric acid monitoring was conducted in the E03 trial with a moderate but not significant trend towards increased gastric acid output. However, no clinically significant correlation was noted.¹
Discussion

Burneo et al. previously reported significant weight loss in 32 patients over a 2 year period with a correlation between increased weight loss and current output. These results were though to be related to a decrease in appetite and gastrointestinal side effects secondary to vagal nerve stimulation. Our results were contrary to these and did not show any evidence of weight loss when patients were followed for a mean of 18 months. A wide variety of VNS settings and models exist, which limits a direct comparison between these two studies. However, our results would suggest gastrointestinal complications in current day VNS practice are of limited clinical significance.
Summary

Vagal nerve stimulation does not lead to a significant effect on weight loss. No factors were identified to suggest any change in vagal tone at the gastrointestinal level is of clinical significant.
References

