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Letter to the Editor

Case Report of an Interaction of a Vagal Nerve Stimulation System with a Microwave Current from a Body Fat Analyzer

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TO THE EDITOR:

The available options for patients who suffer from depression that is refractory to pharmacologic, psychotherapeutic and electroconvulsive therapies are limited. Vagus nerve stimulation (VNS), which has been used for the treatment of epilepsy since 1997, was approved by the FDA in 2005 for use in patients with refractory depressive episodes due to MDD or Bipolar II Disorder (1). Here, we describe a case of a patient with Bipolar II Disorder in a depressed state for 3 years who was treated effectively with VNS therapy but whose depressive symptoms returned following use of a microwave body fat analyzer, which may have interacted with the VNS generator or the lead.

The patient is a 62-year-old female with Bipolar II Disorder in the depressed phase refractory to multiple medical therapies including various medication regimens (SSRIs, TCAs, MAOIs, mood stabilizers) and electroconvulsive therapy. Prior to VNS therapy, the patient complained of various levels of anhedonia, loss of energy and interest, positive guilt, poor concentration, and positive suicidal ideation without a plan. Two weeks after the patient received the VNS implant, it was programmed at 0.25 mA, at which time the patient was on Venlafaxine XR 112.5 mg qam, Aripiprazole 10 mg qday, and Methylphenidate 20 mg bid. She reported increased energy, decreased anhedonia and improved sleep as the input was steadily increased by 0.25 mA increments in the following months to a final setting of 1.25 mA, 30Hz, 250μSec, 30 seconds on/5 minutes off. Eight months later, the patient described a positive response with good tolerability. She reported increased interest and energy, and denied anhedonia and guilt. Six months later the patient utilized an OMRON® body fat analyzer at her gym, which calculates body fat percentage by sending a 500μA/50kHz microwave current through the body. She was unaware of the OMRON® manual, which states individuals with "medical electronic implants such as pacemakers" (2) should not use the unit. Immediately following this exposure, the patient reported feeling an increase in the strength of the VNS emissions, which caused headache, throat pain and difficulty breathing. The settings were examined the next day, which showed no changes from the last programming. In the weeks following the incident, the VNS input was titrated down by 0.25 increments to 0.25 mA and then slowly increased to 1.5 mA. Five months later, the patient reported improved symptoms and milder depression for the first time since the event (1.5 mA, 30Hz, 250μSec, 30 seconds on/5 minutes off).

Although the body fat analyzer uses a microcurrent (500μA) we believe it was strong enough to interact with the VNS generator or the lead. It did not alter the settings but may have increased the discharge rate along with the patient's sensitivity to the treatment. Decreasing the input and allowing the body to heal itself provided improved results. This case suggests that physicians prescribing VNS therapy should instruct their patients about possible interactions with microwave devices.

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