Vagus nerve stimulation for Lennox-Gastaut syndrome

Callosotomy and Vagus Nerve Stimulation treatments are significantly beneficial to reducing seizures, without superiority between them [1)].

A meta-analysis of 480 patients with LGS suggests that 54% of patients responded to adjunctive VNS Therapy and that the treatment option was safe and well-tolerated. The response in patients with LGS was comparable to heterogeneous drug-resistant epilepsy populations [2)].

Because VNS has a lower potential for adverse effects, these results suggest that VNS should be considered first in appropriately selected patients [3)].

Case series

A retrospective chart review of a cohort of pediatric patients (Age 1-18 years old) with LGS implanted with an auto-stimulation VNS model at a single level four pediatric epilepsy center. Patient responder's rate was measured as seizure reduction over baseline and improvements in five quality-of-life measures as reported by the patients and families. Efficacy and tolerability were assessed at 1, 3, 6, 12, 18 and 24 months compared to baseline.

Results: This cohort includes 71 consecutive children with Lennox-Gastaut syndrome who underwent implantation with one of two models of the auto-stimulation VNS. The average age of the children at implantation was 20.82 months. Of those patients, 55 % of patients achieved greater than 50 % seizure reduction at six months, 67.7 % at 12 months, and 65 % at 24 months. At 12 months 11 % of the patients were completely seizure free and at 24 months 17 % were seizure free. By 24 months post implantation most of the patient families reported at least a 50 % improvement rate in one or more of the quality-of-life measures. The most commonly reported adverse events were dysphonia, paresthesia, and shortness of breath, all of which were tolerated and subsided by 24 months.

Significance: This study provides evidence that VNS models with the auto-stimulation paradigm based on detection of tachycardia are well tolerated and effective in a pediatric population with LGS. Furthermore, this study shows that for this population, the auto-stimulation models of the VNS may provide additional benefits over the earlier VNS versions [4)].

Hosain et al. treated 13 patients with Lennox-Gastaut syndrome between the ages of 4 and 44 years (mean, 16.7 years) with vagus nerve stimulation. During the first 6 months of treatment, vagus nerve stimulation produced a median seizure rate reduction of 52% (range, 0% to 93%; P = .04). At 6 months of follow-up, three patients had a greater than 90% reduction in seizures, two had a greater than 75% reduction, one had a greater than 50% reduction, and six had at least a 25% reduction. One

patient did not improve. No patient worsened after initial improvement. Side effects, including hoarseness, coughing, and pain in the throat, were transient and tolerable. No patient discontinued vagus nerve stimulation. The results suggest that vagus nerve stimulation could be an effective and safe adjunct therapy for the treatment of Lennox-Gastaut syndrome [5)]

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