Responsive Vagus Nerve Stimulation for drug-resistant pediatric epilepsy

Abstract

Introduction: Close-loop VNS neurostimulator is able to detect episode of ictal tachycardia and identify it as pre-critical episode, therefore linked to onset of a crisis. In addition to standard VNS open-loop stimulation, this responsive device provides automatic stimulation produced in response to sudden increase in heart rate of at least 20% of the basic one. We wanted to show our experience with use of responsive Aspire SR 106 system in drug resistant pediatric epilepsy. Material and method: We selected 6 patients, 3 males and 3 females, 2 with Post Traumatic Epilepsy, 1 with Postanossic, 2 with Cryptogenetic Epilepsy. Age at implantation was 13 + _ 4.4 years, duration of disease was 9 + -2 years. All patients underwent to implant of responsive Aspire SR 106: surgical procedure was not different from implantation of standard VNS system but position of generator was more medially. Stimulation started 15 days after implant and effective amplitude was achieved with increments of 0.50 mA every two weeks. Follow-up varied from 6 months to 12 months. Results: 1 patient presented complete resolution of seizures with control of both partial and generalized seizures, 3 patients reduction of seizures frequency > 50%, 1 patient reduction <50%, while 1 patient did not present substantial improvement. In responder patients was also detected significant reduction in seizures duration and they declared themselves satisfied with the result. In one case there were side effects consisting of cough and dysphonia that limited the increase of stimulation amplitude. VNS had effects on QoL with reduction in anxiety, mood improvement, enhanced verbal recognition memory. Conclusions: Responsive VNS therapy may be considered in pediatric patients with medically refractory epilepsy who are not favorable candidates for resection. It is safe procedure with low morbidity. VNS decreases seizure frequency but also reduce their intensity and has favourable effect on patient's mood.

Publications