Seizure Frequency Following AspireSR® Vagal Nerve Stimulator Implantation - A Single Institution Report

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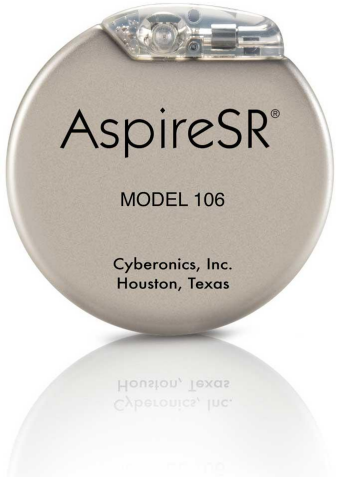
Introduction

Vagal nerve stimulator (VNS) implantation has been shown to benefit some patients suffering from epilepsy and is a safe therapeutic option (1). A newer model, the AspireSR® has shown promising preliminary results, challenging the conventional "rule of thirds" in VNS therapy (2). We sought to validate these results at our institution.

Methods

We retrospectively analyzed 25 patients who underwent VNS implantation with the AspireSR®, 8 of whom had a previously-implanted VNS and received the new model. We analyzed seizure frequency prior to AspireSR® implantation and following implantation at time points 3 months, 6 months, 1 year, and 1.5 years.

Aspire SR 106



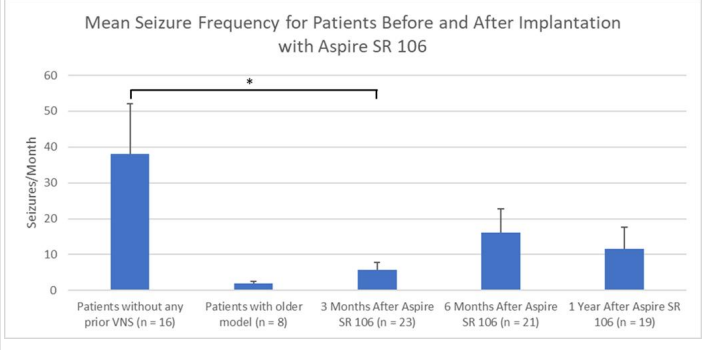
Model evaluated in our study.

Results

AspireSR® implantation was associated with a decreased seizure frequency at 3 months post-operatively. However, no statistical significance could be detected between pre-operative seizure frequency and post-operative seizure frequency at 6 months and beyond. For patients who did not previously have VNS implantation, pre-operative seizure frequency strongly predicted seizure frequency at 6 months and 1 year post-operatively. Seizure frequency at 3 months post-op most strongly predicted seizure frequency at 1.5 years post-op, suggesting decreased magnitude of immediate post-op seizure reduction was predictive of subsequent therapeutic failure. It is important to note, however, that data was only available for 13 patients 1.5 years post-surgery.

Table	
	p-value
Difference Between Pre-VNS and 3 Months After Implantation with Aspire SR 106	0.025
Correlations	
	R-squared
Before VNS and 6 Months After Aspire SR 106	0.798199
Before VNS and 1 Year After Aspire SR 106	0.716707
3 Months After Aspire SR 106 and 1.5 Years After Aspire SR 106	0.908883

Table detailing p-value and correlation values presented in the study.



Bar graph showing mean seizure frequencies and standard error for patients at different time points in the study.

Conclusions

Although the AspireSR® has shown promising results in a previous study, these results may not be generalizable. Our data indicated that treatment with the AspireSR® may result in short-term seizure reduction, but a sustained effect past 3 months was not observed. One possibility is that certain patients with higher seizure burden would more likely benefit from the AspireSR®. One potential limitation of our study is that the smaller sample size may lack the power necessary to detect a statistically significant difference, but this is currently early data, and we will analyze more patients for a longer period of time in the future.

Learning Objectives

By the conclusion of this session, participants should be able to:
1) Describe the importance of vagal nerve stimulators in treatment of refractory epilepsy;
2) Assess the efficacy of the AspireSR® in reducing seizure frequency based on our institution's experience.

References

1. Englot DJ, Chang EF, Auguste KI. Vagus nerve stimulation for epilepsy: a meta-analysis of efficacy and predictors of response. Journal of Neurosurgery. 2011; 115(6): 1248-1255.

2. Hamilton P, Soryal I, Chelvarajah R, et al. Clinical Outcomes of VNS therapy with AspireSR® (including cardiac-based seizure detection) at a large complex epilepsy and surgery centre. Seizure: European Journal of Epilepsy. 2018; 58: 120-126.