Complications of DBS Generator replacement surgeries: optimizing individualized treatment options

Indiana University School of Medicine
- Fort Wayne Center
Parkview Regional Medical Center

Samuel Stegelmann  BS, Fen-lei Chang PhD, William F. Young, MD.
Disclosures

• The authors have no disclosures regarding this presentation
Introduction

- Deep Brain Stimulation (DBS) is an FDA approved treatment for movement disorders. The device is powered by an impulse generator (IG) with a fixed life (FIG) or rechargeable battery (RIG). FIGs have a shorter life span, but have been preferred by patients due to convenience. RIGs cost more per unit, must be manually recharged by the patient, but have a longer life span requiring fewer total surgeries. IG replacement is a surgical procedure associated with risk of complications, the most common being surgical site infection (SSI). Additional risks of surgery include; lead migration/fracture, and skin erosions. Certain risks factors may portend higher risks for surgical complications of IG replacement surgeries. The purpose of this study was to identify patient characteristics that could be associated with a higher risk of complications.
Methods

• This is a retrospective medical record chart review. Our cohort included adult patients (> 18 yrs. Of age). Patients were identified from a prospectively maintained database of patients undergoing generator replacement. Surgeries were performed at a single institution; Parkview Regional Medical Center. During the period 2006-2019. Complications were recorded up to 6 months after generator replacement. Potential risk factors for SSI included: Age, Sex, BMI, hypertension and diabetes. SSI was defined as a positive lab result showing infectious organisms. Patients who did not receive adequate follow up or those who did not meet our inclusion criteria were excluded. After excluding 5 procedures that did not meet our inclusion criteria, our study included 50 patients who underwent total IG replacement surgeries.
Results

- 50 patients were identified receiving 71 IG replacement. The mean age was 70.4. SSI’s occurred in 3 patients (4.23%). Patients with SSI had an average BMI of 27. This was not statistically significantly lower than those without a SSI (30.8%). 66% of SSI group had diabetes (n=2) and 100% had hypertension (n=3). The non-SSI group 23.5% had diabetes (n=16) and 51.5% had hypertension (n=3). The non-SSI group 23.5% had diabetes (n=35). SSI’s occurred more significantly in patients with both diabetes and hypertension.
Discussion

- In our study SSI rates were comparable to those reported in the literature. Our study is limited by small sample size and thus definitive conclusions cannot be made. We plan to expand our study to better characterize the significance of risk factors. This data may help to determine if using rechargeable generators is more cost effective. Currently insurance carriers are reluctant to authorize rechargeable generators for most patients due to the initial cost. Our ability to identify patients with higher risk factors for SSI may provide a better balance between patient morbidity, patient preference and cost containment.
Summary Points

• Surgical site infection after generator replacement for DBS surgeries is an on going issue.

• Determining risk factors for SSI in this group may be useful in determining who may be better managed with a rechargeable generator.