Can Preoperative Electrocochleography (ECOG) Predict Hearing Outcomes in Patients with Endolymphatic Hydros who Undergo Endolymphatic Sac Decompression

INTRODUCTION

Endolymphatic hydrops (ELH) refers to increased hydraulic pressure within the inner ear’s endolymphatic system causing fluctuating hearing loss, episodic vertigo, tinnitus, and aural fullness. Although its value has been controversial, electrocochleography (ECOG) has been used to confirm the presence of ELH based on the enlarged ratio of summating potential to action potential. While medical therapy continues to be the mainstay of treatment, endolymphatic sac decompression (ELSD) has been demonstrated to improve the quality of life for patients with intractable ELH while preserving both vestibular and cochlear function. Hearing following ELSD has been shown to remain unaltered or improved.

METHODS

57 patients aged 15-72 with ELH based on symptoms who failed conservative therapy proceeded to undergo ELSD. All 57 patients underwent an audiogram at least one month following surgery. Low frequency pure tone averages (PTA) - 500, 1000, and 2000Hz - of the pre- and postoperative audiograms were calculated to account for the low frequency hearing loss typically seen in ELH. The change in PTA were correlated with the preoperative ECOG to see if a positive ECOG was associated with a greater decrease in the postoperative low frequency PTA. This was compared with a negative ECOG and PTA changes.

OBJECTIVE

We wished to assess whether a positive ECOG (summating potential/action potential >0.35) may be predictive of poorer hearing results in patients undergoing ELSD for intractable ELH.

RESULTS

There were no overall statistical differences in pre- and postoperative PTA (P=0.53) nor were there significant differences in PTA in patients with only positive ECOGs (P=0.84) or negative ECOGs (P=0.39).

Overall the mean ECOG was 0.38 (CI 0.32-0.42). Preoperative mean PTAs were 25.3 (CI 19.9, 30.7) and postoperative PTAs were 26.5 (CI 21.4, 31.4) (Table 1). For patients with positive ECOGs, the mean ECOG was 0.49 (CI 0.45, 0.53) and mean PTA pre- and postoperatively were 25.5 (CI 17.8, 33.2) and 26.0 (CI 18.8, 33.2) respectively. For patients with negative ECOGs, the mean ECOG was 0.25 (CI 0.22, 0.28) and mean PTA pre- and postoperatively were 24.1 (CI 17.0, 31.8) and 26.7 (CI 18.8, 33.2) respectively.

To assess whether the preoperative ECOG predicted changes in the pre and postop PTA, a linear regression analysis was performed. There was no statistically significant association in the change in preop and postop PTA with a positive preop ECOG (r^2 = -0.14) nor a negative ECOG (r^2 = 0.41) – See Figures 1-2.

CONCLUSION

A positive ECOG does not significantly correlate with poorer postoperative hearing results in patients who undergo endolymphatic sac decompression.