Racial Disparities in Cochlear Implantation and Hearing Aid Usage

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Introduction

- Literature has shown that rates of hearing loss (HL) differ between different racial groups.[1, 2]
- In a center-based study, non-white patients were **less likely** to pursue cochlear implant (CI) surgery compared to their white counterparts.[3]
- **Black race** has been shown to decrease the odds of hearing aid (HA) acquisition.[4]
- Questions remain as to whether disparities in CI persist while accounting for hearing loss differences on a national scale, and whether the disparities among CI and HA appear to be of equivalent severity.

Objectives

- Assess whether CI disparities persist while accounting for HL on a national scale.
- Determine whether there is a potential difference between CI and HA disparity on a national scale.

Results

Figure 1. Prevalence Ratio of Percentage of CI Candidates Over Percentage of CI Surgeries by Race. This graph displays the ratio of the relative proportion CI candidacy over proportion of CI surgeries for each racial group.

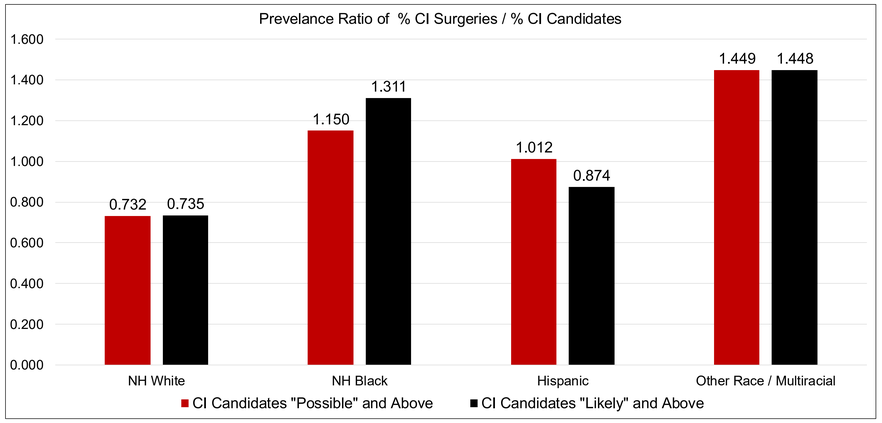
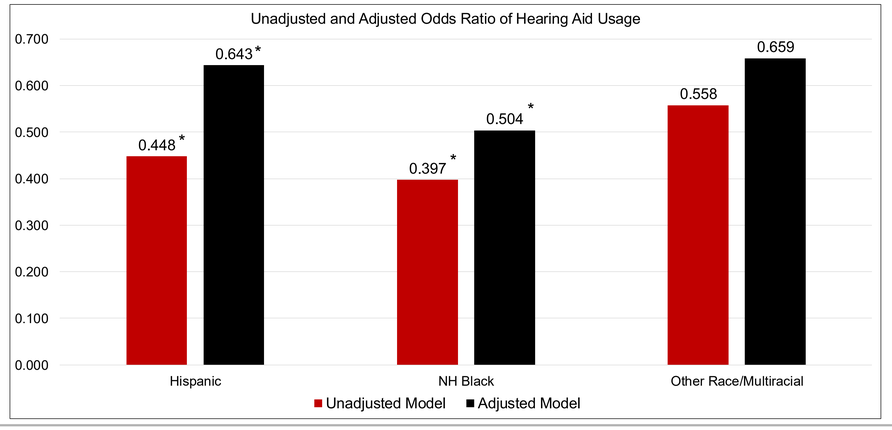


Figure 2. Unadjusted and Adjusted Odds Ratio of Hearing Aid Usage. This graph displays the odds ratio of hearing aid usage as predicted by racial group while accounting for hearing loss in both adjusted and unadjusted models. Non-audiologic co-variates are included in the adjusted model. The * symbol denotes a p value <0.05.



Methods

- Data between 2005-2020 from the **National Health and Nutrition Examination Survey (NHANES)** was analyzed.
- A previous study assessing cochlear implant prevalence using National Inpatient Sample (NIS) data from 2001-2018 was used to determine prevalence of CI surgery among different racial groups.[5]
- CI candidacy → based on the severity of hearing loss present in each ear, as measured in NHANES, and classifications into “Non-Candidate”, “Possible Candidate”, “Likely Candidate” and “Highly Likely Candidate” were made under advisement of a neurotologist.
- Hearing loss was determined via pure tone threshold measurements across 500, 1000, 2000, and 4000Hz.
- A prevalence ratio (PR) was calculated as PR = % CI Surgeries / % CI Candidates in order to compare findings across the two databases.
- Two PRs for each racial group was calculated, one determining % CI Candidates from those classified as “Possible Candidates” and above (n = 1196), and the other from “Likely Candidates” and above (n = 169).
- An adjusted logistic regression model was constructed using NHANES, with hearing aid usage acting as the primary response variable, and race behaving as the primary predictor variable.
- The covariates of hearing loss, age, sex, education level and income were included in the model (n = 9839), all of which have been shown to have a significant effect on hearing aid uptake in previous studies.[6]
- White race acted as the baseline.

Conclusion

- In this study, white patients appear to have a possible undersupply of cochlear implantation compared to NH Black and Hispanic patients.
- However, while controlling for hearing loss, both NH Black and Hispanic populations demonstrate a large, significant decrease in odds of hearing aid usage.
- These findings suggest that while cochlear implantation may meet demands for traditionally underserved populations, there are potentially unmet needs concerning hearing aid availability for Black and Hispanic populations.
- Hispanic populations are unique in that they demonstrate an under fulfillment in both CI and hearing aids.

Future Directions

- Further work should be done to assess barriers to hearing aid availability for Black and Hispanic patients.
- Future research in CI/HA disparities may benefit from increased focus on Hispanic populations, as this group demonstrates deficiencies in both CI and HA usage.

References

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