Improving Outcomes for Long-Term Hearing Aid Users through Group AR: A Case Study of Four Participants

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ABSTRACT

Long-term hearing aid users are often overlooked as a population of patients who may benefit from additional audiologic rehabilitation opportunities. The implementation of an audiologic rehabilitation program that addresses the daily difficulties faced by these patients and their significant others can result in a variety of subjective and objective outcomes. This study examines some of the contributing factors and outcomes for four patients who attended the Ohio State Summer intensive Audiologic Rehabilitation Conference (SIARC).

INTRODUCTION

- For patients who still struggle despite appropriate amplification, an intensive model of Audiologic Rehabilitation (AR) may be considered.
- Group AR has shown reasonably good short-term benefit but results have been variable.
- Group AR is more effective when completed with a communication partner.
- Most research focuses on new hearing aid users. Less is known about experienced hearing aid users.
- The purpose of this case study is to examine the effectiveness via outcome measures for four long-term hearing aid users and their communication partners who attend a three-day long intensive group AR conference.

SIARC AT OSU

- First hosted in OSU in 2015, modeled after SIARC at University of Texas at Dallas
- Three-day conference for patients with hearing loss and their primary communication partner
- Hosted by faculty and AID students at OSU
- Support provided by industry partners and local businesses

Participants

- Experienced hearing aid users (primarily) who continue to struggle with communication
- Communication partners, generally spouses and/or children of the patient

Materials & Testing

- Questionnaires:
  - CDQ
  - HHIE
  - SPIN
  - CDIC
  - Program satisfaction survey
- Speech recognition in noise: R-SPIN
- Unaided condition
- Aided condition
- Aided condition with assistive listening device (AID)

Program Components

- Student Partners: Participants were paired with 2-3 AID student partners who helped guide them through the conference and personalize class content
- Testing & Hearing Aid Technology: Participants’ hearing was tested and they were fitted with appropriate amplification and AIDs. OR current amplification was verified/validated and AIDs added if appropriate
- Interaction Classes: Courses taught by AID students; content included basics of hearing loss, communication strategies, auditory training, and psychosocial aspects of hearing loss
- Social Outings: Provided real-world listening environments (restaurant and a local tour) to practice use of communication strategies and demonstrate AIDs

CASE 1: TECHNOLOGY

- 62-year-old female with a beneficiary moderate to profound bilateral SNHL.
- Pre-study evaluation on the left: Left ear very, left ear mild.
- Little improvement in hearing aid use since childhood.
- Pre-study evaluation:
  - Oticon Alta 2 Pro-BTCS (2 years old) with Streamer Pro and TV Convective
  - Communication partner: Husband
- Outcomes:
  - Improvement on COM+GO goals with use of demo technology (Ruger pen)
  - Ability to hear in groups: 50% of time
  - Ability to hear at work and in meetings: 95% of time
  - Post-Conference: Post-Conference technology: Oticon Apt Pro-BTCS
  - Communication Partner: Husband
  - HHIE subscale scores for post-conference (Figure 1)

CASE 2: IMPROVED QUALITY OF LIFE

- 76-year-old female with 45-year history of Bilateral moderately-severe to profound SNHL.
- Pre-study evaluation:
  - Right ear R-SPIN = 62 dB, Left ear = 61 dB
- 30-years of hearing aid use; satisfied with hearing aids.
- Leads an active lifestyle and would like to maintain her communication abilities.
- Pre-Conference Technology: Oticon Apt Pro-BTCS
  - Communication Partner: Husband
- Outcomes:
  - Purchased new advanced level hearing aids post-conference:
  - Improvement on COM+GO goals:
    - Understanding husband: Better
    - Improved quality of life: Better
    - Understanding phone messages: Much truer
  - Changes in HHIE scores for post-conference (Figure 2)

CASE 3: INCREASED SELF-AWARENESS

- 75-year-old male with 12-year history of mild to severe SNHL in the right ear, and a profound SNHL in the left ear.
- Pre-study evaluation:
  - PS-4: Right ear = 56 dB HL, Left ear = 98 dB HL
  - Monaural hearing aid user
  - Pre-Conference Technology:
    - Oticon 3Pro-3 BTCS for the right ear / month aid
  - Communication Partner: Wife
- Outcomes:
  - Improvement on COM+GO goals
  - Better ability to understand speech in the car: Better
  - Improve communication with his grandchildren: Better
  - Improvement in R-SPIN scores (Figure 5)
- Change in HHIE scores (Figures 6 & 7)

CASE 4: ADVOCACY

- 58-year-old female with cochlear SNHL, and 25-30 years of HA use.
- Pre-conference: R-SPIN despairing to severe SNHL bilaterally
  - Right ear R-SPIN = 60 dB HL, Left ear = 59 dB HL.
  - Oticon Alta 2 Pro-BTCS (2 years old) with streamer and remote microphone
  - Communication Partner: Husband and daughter (college student)
- Outcomes:
  - Purchased advanced level hearing aids
  - Improved functional detection levels and word recognition in quiet and in noise level
  - Subjective report of improvement in communicative behavior of family
  - Decreased scores on HHIE for self (Figure 8)
  - Family results incomplete

Participant Testimonial:

“Over the past 5 years, I have been an advocate for hearing loss and trying to help other hearing aid users gain more hearing. It has been my passion that someday I could be a ‘hearing aid coach.’ After attending your SIARC conference, I was contacted by Chair/Courage and just accepted a position yesterday with the company to start pursuing my passion and help others. Your SIARC conference helped me realize that hearing loss is much more than hearing aids.”

SUMMARY & CONCLUSIONS

- Each patient had a different measurable outcome, yet all subjectively reported benefit from attending the conference.
- Patient 1: Achieving COM+GO Goals with Demo Technology
  - HHIE: No change
  - Patient achieved benefit through technological solutions
- Patient 2: Improved Quality of Life
  - HHIE: Substantial decrease in hearing handicap, for both social and emotional subscales
  - Significant reduction in HI may indicate his ability to successfully implement new communication strategies into every day life
- Patient 4: New Job Advocating for Those with Hearing Loss
  - HHIE: Decreased perception of handicap for both subscales
  - Purchase of new devices
  - Participant Satisfaction Surveys:
    - All participants “agreed” or “strongly agreed” on survey questions measuring satisfaction with the program and skills learned.

Participant Testimonials:

- “We gained increased knowledge on hearing loss in general, the latest technology, and the need for improved communications. It was by far the best conference of any type that my wife and I have attended. We will benefit for the remainder of our lives.”

Conclusions:

- Long-term hearing aid users can benefit from group AR

- Variability in results suggest that clinicians should consider using multiple outcome measurement tools to determine individual benefit

REFERENCES


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Figure 1. RHIE recognition performance indices and words with high and low predictability presented in two aided conditions: (1) aided with hearing aids and (2) hearing aids plus ALD.
Figure 2. R-SPIN recognition performance indices and words high and low predictability presented in two aided conditions: (1) hearing aided (gray bar), and (2) hearing aids plus ALD.
Figure 3. R-SPIN recognition performance indices (gray bar), post-conference (gray bar), and 3-months post-conference (blue bar).
Figure 4. R-SPIN recognition performance indices for the Communication Partner: gray bar (pre-conference), pink bar (post-conference), and 3-months post-conference (blue bar).
Figure 5. Change in HHIE scores for the Communication Partner: gray bar (pre-conference), pink bar (post-conference), and 3-months post-conference (blue bar).