Hearing Loss in the Aging Population

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Objectives

• Understand the importance of regular hearing screening for all patients over 60 years old, and/or those with significant noise exposure history.

• Recognize the effects of hearing loss, including cognitive decline.

• Provide appropriate counseling to patients, as patient perceptions and expectations are the most important factors in patients acquiring and using hearing aids.

• Acknowledge that hearing aid success is largely dependent on motivation and realistic expectations.

• Discuss multiple technology options (other than hearing aids) that may help individuals with all types of hearing loss. A referral to an audiologist is the best option to determine which options are available for a patient.
Prevalence

• 3 in 10 people over age 60 have hearing loss
• 1 in 6 baby boomers (ages 52-70) have a hearing problem
• 1 in 14 Generation Xers (ages 29-51) already have hearing loss
• Only 13% of physicians routinely screen for hearing loss during a physical
  • Most people with hearing impairments hear well in a quiet environment like a doctor’s office (those with high-frequency hearing loss typically do okay in quiet)
  • Hearing Loss Simulator - Find Out What Hearing Loss is Like
• The average patient waits 7-10 years before seeking treatment for hearing loss

Signs of Hearing Loss

Socially:
• require frequent repetition
• have difficulty following conversations involving more than 2 people
• think that other people sound muffled or like they’re mumbling
• have difficulty hearing in noisy situations, like conferences, restaurants, malls, or crowded meeting rooms
• have trouble hearing children and women
• have your TV or radio turned up to a high volume
• answer or respond inappropriately in conversations
• read lips more intently
Signs of Hearing Loss

**Emotionally:**
- feel stressed out from straining to hear what others are saying
- feel annoyed at other people because you can't hear or understand them
- feel embarrassed to meet new people or from misunderstanding what others are saying
- feel nervous about trying to hear and understand
- withdraw from social situations that you once enjoyed because of difficulty hearing

**Medically:**
- have a family history of hearing loss
- presence of tinnitus
- take medications that can harm the hearing system (ototoxic drugs)
- have diabetes, heart, circulation or thyroid problems
- have been exposed to very loud sounds over a long period or single exposure to explosive noise

Changes to outer ear common with aging

- **External Auditory Canal**
  - Thinning and drying of skin
    - Prone to trauma, itching
  - Collapsed canals
    - Atrophy of cartilage
  - Impacted cerumen
  - Growths (exostosis, carcinomas)
Middle ear and aging

- Stiffening of tympanic membrane
- Acute Otitis Media
- Otosclerosis
- Cholesteotoma
- Glomus tumors
- Squamous cell carcinomas
- Trauma

Inner ear and aging

- Cochlea
  - Presbycusis
  - Hormonal changes
- Vestibular System
  - Dizziness: BPPV, Postural hypotension
  - Visual Deficits
  - Somatosensory Responses
  - Musculoskeletal Deficits
Other Causes of Hearing Loss

• Cardiovascular Disease
  • Many studies show a tie between cardiovascular disease and hearing loss
  • A research review looking at over 70 studies over 60 years from Wichita State University confirmed a direct link between cardiovascular health and hearing loss (Hull & Kerschen, 2010)
  • In a separate study when controlling for age, hypertension, diabetes, smoking and hyperlipidemia, low-frequency hearing loss was significantly associated with intracranial vascular pathology such as stroke and TIA
    • Significant associations were also seen with peripheral vascular disease, coronary artery disease and a history of MI

• Diabetes
  • Those with diabetes are twice as likely to have hearing loss than non-diabetics (American Diabetes Association, 2016)

• Kidney Disorders
• Genetic Factors
• Ototoxicity
  • Antibiotics (aminoglycosides, erythromycin)
  • Anti-inflammatory drugs (NSAIDs)
  • Loop diuretics
  • Chemotherapy Drugs
  • Cardiac medications (tinnitus)
Hearing loss and cognition

• **Presbycusis**, is one of the top three chronic medical conditions of older people, along with high blood pressure, and arthritis.
  - Nearly 60% of people age 80 and over report hearing difficulties (Newman DL, et al. 2012)
  - Dr. Frank Lin, an otologist and epidemiologist, and his colleagues at Johns Hopkins University found a **strong link between degree of hearing loss and risk of developing dementia**.
    - Mild hearing loss patients are twice as likely to develop dementia
    - Moderate hearing loss were three times more likely
    - Severe hearing loss have 5x the dementia risk as normal hearing patients

Hearing loss and cognition

• Current estimate that 36% of the dementia risk is attributable to hearing impairment
  - This is a theoretical estimate that is currently being tested
  - Increased listening effort and atrophy in underused brain regions
    - Likely causing changes in brain structure and function
Hearing Loss and Cognition

Hearing loss and falls

- 2,017 participants ages 40 to 69 had their hearing tested and answered questions about whether they had fallen over the past year.
- People with a 25-decibel hearing loss, classified as mild, were nearly three times more likely to have a history of falling.
  - Every additional 10-decibels of hearing loss increased the chances of falling by 1.4 fold.
- Gait and balance are cognitively demanding
  - Likely result of environmental awareness and cognitive load
    (Kamil, et al., 2016)
Other effects of untreated hearing loss

• Higher rates of depression, anxiety, and other psychosocial disorders in individuals with hearing loss who were not wearing hearing aids
  • Compared to HA users
  • Hearing aid use was found to positively affect quality of life for both the hearing aid wearer and his or her significant other. (Kochkin & Rogin, 2000)

The role of primary care

• 63 percent of people listed their primary care physician as the most important source of information about where to go for hearing health care services
• Persons with hearing loss are eight times more likely to be positively inclined to purchase a hearing instrument if their physician has recommended one (Popp & Hackett, 2002)
Screening Tests

- Available tests include physical diagnostic tests, such as the whispered voice, finger rub, and watch tick tests
- Patient Questionnaires
  - Hearing Handicap for the Elderly-Screening
    - 10 items
      - Yes, No, Sometimes

Hearing aids

- Current hearing aids are more than simple amplifiers
  - Typical high-end hearing aids have around 20 frequency channels that can be independently adjusted at 4 input levels, changing gain and compression of sounds
  - Hearing aids can identify environments and self-adjust with more than 90% accuracy
    - Capacity to handle 1.2 billion operations per second
- Wireless connectivity
  - 2.4 GHz, made for-iPhone
  - Bluetooth
  - IFTTT (If This Then That) is an ever expanding internet-based service, which enables you to integrate your hearing solution with a vast range of online products and solutions such as your home lighting, doorbell, alarm system, and mobile phone
Other solutions

- FM systems
- TV streamers
- CROS/BICROS systems
- Bone-anchored devices
- Cochlear implantation (including Hybrid)
- ‘Permanent’ hearing aids
Wrapping it up

- Screen patients over 60 years old
- HHIE can be completed with intake paperwork
- Refer to audiologist for complete evaluation
- http://www.asha.org/profind/
- Counsel regarding effects of untreated hearing loss
- Recommend seeking hearing aids or other assistive devices
  - Patients must acclimate to hearing things they aren’t used to hearing

References


Popp, Paul & Hackett, Gregg (2002). Survey of Primary Care Physicians: Hearing Loss Identification and Counseling Audiology Online