Hearing Loss in Elders

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Presbycusis

- Physiologic effects of aging
  - Sensory Presbycusis
    - Degeneration of hair cells & cochlear fibers
    - Sloping, slowly progressive high-freq hearing loss (HL)
  - Neural Presbycusis
    - Loss of cochlear neurons
    - High-freq HL with poor word recognition abilities
  - Strial (metabolic) Presbycusis
    - Degeneration of the stria vascularis
    - Flat HL with good speech recognition
  - Mechanical Presbycusis
    - Alterations to the cochlear mechanics caused by thickening & stiffening of basilar membrane
    - Gradually sloping, high-freq HL with average speech recognition

- Neurological effects of aging
  - Degeneration of central auditory pathways
    - Leads to poorer word recognition and poorer comprehension of connected speech
    - Central auditory involvement can occur without a decline in hearing
    - Patients with auditory processing disorders rate themselves as more handicapped than those without
  - Changes in visual speech perception
    - Further aggravated by visual problems seen in the elderly
  - Change in cognitive abilities
    - Memory, especially working memory
    - Attention
    - Speed of processing
Presbycusis

- Risk Factors for Hearing Loss
  - Arteriosclerosis
    - Interrupts oxygenation of the cochlea
  - Diabetes
    - Interrupts oxygenation of the cochlea
  - Accumulated noise exposure
  - Exposure to ototoxic agents
  - Stress
  - Genetics

Audiologic Considerations

- Pure tone thresholds
  - More rapid decline after 4th decade
- Auditory processing
  - Difficulty discriminating sounds that differ in pitch, duration or intensity
  - Difficulty understanding time-compressed or filtered speech
  - Difficulty understanding if there is a competing signal
- Speech Recognition
  - Beyond 60, WRS scores decline 13% per decade in males and 6% in females

Incidence of Hearing Loss

- MarkeTrak survey (2004) estimated that 31.5 million people report a hearing difficulty; that is around 10% of the U.S. population
- General Guidelines:
  - 66% of persons 85 years or older have hearing loss
  - 3 in 10 people between the ages of 65-84 have hearing loss;
  - 1 in 6 baby boomers (ages 41-59), or 14.6%, have a hearing problem;
  - 1 in 14 Generation Xers (ages 29-40), or 7.4%, already have hearing loss;
  - At least 1.4 million children (18 or younger) have hearing problems;
  - It is estimated that 3 in 1,000 infants are born with severe to profound hearing loss.
Simulation of Hearing Loss

1000 Hz LP

“Hearing impairment is an invisible handicap, yet its effects upon one’s personal health, happiness, and personal well-being are very real.”
Chartrand, 2005

Reactions to Hearing Loss

- Physical
- Behavioral
- Emotional
- Cognitive

Trychin, 2001
Physical Reactions
- Muscle tension
- Stomach problems
- Fatigue **
- Headaches
- Increased blood pressure
- Appetite changes

Behavioral Reactions
- Bluffing
- Withdrawing
- Blaming
- Demanding
- Dominating conversations

Emotional Reactions
- Anger
- Anxiety
- Depression
- Embarrassment
- Frustration
- Guilt
Cognitive Reactions

• Can’t think straight – confused
• Hard to focus
• Distracting thoughts
• Distrustful of others
• Decreased self esteem
• Can’t remember what you cannot hear clearly in the first place

Mental Health Risks

• Becoming chronically nervous or anxious
• Becoming chronically sad or depressed
• Feeling angry
• Loss of group identity
• Feeling marginalized
  – Socially and within the family
• Loneliness

Mental Health Risks

• Becoming distrustful of people
• Withdrawing from social contact
• Developing poor self-image
• Feeling incompetent
• Feeling unacceptable to others
• Feeling loss of influence or control
Alzheimer’s or Hearing Loss?

- Alzheimer’s Disease (AD) is difficult to Dx
  - Studies suggest a 45% misdiagnosis rate
- Screening exams for AD are administered verbally
  - Assume normal hearing and central auditory processing ability
- Hearing evaluations are not performed in most cases
  - Literature also documents other cognitive conditions (depression, anxiety, anti-social behaviors) that are caused by undiagnosed and uncorrected HL

Symptom Analysis and Comparison

<table>
<thead>
<tr>
<th>Late Onset AD</th>
<th>Untreated HL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression, anxiety, disorientation</td>
<td>Depression, anxiety, social isolation</td>
</tr>
<tr>
<td>Reduced language comprehension</td>
<td>Reduced speech discrimination</td>
</tr>
<tr>
<td>Impaired memory (esp. short-term)</td>
<td>Reduced cognitive input into memory</td>
</tr>
<tr>
<td>Inappropriate psychosocial responses</td>
<td>Inappropriate psychosocial responses</td>
</tr>
<tr>
<td>Loss of recognition</td>
<td>Reduced mental scores</td>
</tr>
<tr>
<td>Denial, defensiveness, negativity</td>
<td>Denial, defensiveness, negativity</td>
</tr>
<tr>
<td>Distrust, suspicion of other’s motives</td>
<td>Distrust, paranoia</td>
</tr>
</tbody>
</table>

Chartrand, 2005

Hearing Loss is a Communication Disorder
The Importance of Communication

- Independence
- Stimulating thinking
- Maintaining social networks
- Enhance well-being
- Facilitating adaptation to change
- Participation in activities of life

Worrall & Hickson (2003)

What is the most important activity for maintaining quality of life?

- Spending time with family and friends (96%)
- Religious or spiritual activities (82%)
- Exercise and physical activity (80%)

AARP 2003

Implications

- More than 20 million Americans live their lives with untreated HL
  - They are lonely and have trouble communicating with loved ones
  - They are isolated and feel left out of conversations
- Untreated HL costs the US economy $56 BILLION in lost productivity, special education, and medical care.
Who does it affect?

• EVERYONE
• “When someone in the family has a hearing loss, the entire family has a hearing problem”
  – Mark Ross
• Communication is a 2-way street
  – The listener and speaker both experience problems when communication breaks down
  – The listener and speaker both contribute to communication breakdowns
  – The listener and speaker are both part of the solution

Clues to look for

• Frequently asking for repetition
• Inappropriate responses/Pretending to understand
• Difficulty in groups
• Puzzled expression when listening
• Strained expression around eyes
• Turning head to hear better
• Avoiding social situations
• Talks too loud/soft
• Turns up TV/Radio
• Blames others for mumbling

Common Problem Situations

• Understanding on the telephone
• Conversing in a car
• Hearing alarm signals
• People whispering
• Voices on TV
• Restaurants/Family dinners
• Speaking from another room
• Not seeing the speaker’s face
• Medical Situations
Problems for Family Members

- Remembering what to do
- Deciding what they understand
- TV/Radio too loud
- Having to repeat – A LOT
- Being the interpreter
- Dealing with SO’s irritation
- Lack of communication
- SO’s dependence on them
- Isolation from family/social situations

Effects of HL on Health and Quality of Life

- HI individuals have more chronic conditions
- More likely to have a Dx of depression
- More likely to seek outpatient services
- Adversely affects:
  - Quality of Life
  - Physical & Psychosocial Functioning
  - Communication with health care providers
    - Increase likelihood of unfavorable outcomes
    - Patient may be underserved or inappropriately served

Green & Pope, 2001
National Council on Aging study

• Conducted in May 1999
• Included more than 2000 Hearing Impaired (HI) persons and their family members or close friends
• Objectives of the study:
  – Measure the effect of untreated hearing loss on quality of life among members of the HI;
  – Compare the perceptions of the HI with family members
  – Identify the reasons that those with HI do not seek treatment
  – Assess the impact of using hearing aids on the quality of life of users

Effects of Untreated HL on Quality of Life

• Untreated
  – Sadness and Depression
  – Worry and anxiety
  – Paranoia
  – Less social activity
  – Emotional turmoil and insecurity
  • Increases with severity of HL

• Treated
  – Better relationships with their families
  – Better feelings about themselves
  – Improved mental health
  – Greater independence and security
  • Family members were even more likely to report improvements

Despite the Positive Benefits - Only 1 in 5 Use Amplification
Why only 1 in 5?

- Unaware/Denial of HL
- Blame others for their problem
- Financial constraints
- Vanity
- Misinformed
- Failed attempts at HAs
  - Themselves or friends
- Inappropriate expectations

So, why won’t they use hearing aids?

- Denial
  - “My hearing isn’t bad enough”
  - More than half of persons who had severe HL denied needing HAs
- Consumer Concerns
  - Cost
  - Won’t help my problem
  - They don’t work well
  - I don’t trust the hearing specialists
  - I’ve tried one before

So, why won’t they use hearing aids?

- Stigma
  - It would make me feel old
  - Don’t like the way they look
  - Too embarrassed
  - What will others think about me?
Beyond the Hearing Loss

- Other Sources of Communication Difficulty
  - Speaker
  - Listener
  - Message
  - Environment

The Speaker

- Talks too fast
- Talks too softly
- Does not use CLEAR speech
- Does not get the listener’s attention
- Hands or objects obscure face
- Talks from behind or in another room
- Drops voice at end of sentence

The Listener

- Inattention
- Lack of motivation
- Inefficient/Non-use of HA
- Fatigue
- Emotionally upset
- Speech discrimination problems
- Visual problems
The Message

• Too verbose
• Too much jargon
• Use of run-on sentences
• Lack of repetition
• Slang
• Ambiguous references

The Environment

• Background noise
• Several people speaking at once
• Lighting
• Viewing angle
• Distractions
• Poor acoustics
• Public address system announcements

Myths About Hearing Loss

• Talking in a loud voice will allow you to be heard and understood
• Hearing aids restore normal hearing
• People with nerve loss cannot benefit from hearing aids
• “He can hear me when he wants too”
• Lip-reading can be a substitute for hearing
Rehabilitation
- Evaluation by a licensed audiologist and/or otolaryngologist
- Hearing Aids
- Assistive Devices
- Cochlear Implants
- Living with Hearing Loss Classes
- Listening Training
- Lipreading training
- Coping Strategies
- Assertiveness Training
- Counseling

Hearing Aid Decisions
- One vs. Two
- Size
- Style
- Technology level
- Features

Size and Style
ITD Hearing Aids

- Top 3 reasons:
  - Poor benefit (29.6%)
  - Poor performance in background noise (25.3%)
  - Fit & Comfort (18.7%)

Kochkin, 2000

Assistive Listening Devices

- EXAMPLES:
  - FM hearing aids
  - Shake Awake Alarm Clocks
  - Amplified telephone
  - Amplified stethoscope
  - TDDs & Voice Carry Over telephones
  - Hearing dogs

Cochlear Implants

- Device that converts acoustical energy to electrical pulses which stimulate the auditory nerve
- Designed for persons who are receiving limited benefit from hearing aids
- People of all ages can receive an implant (<1 yr -- ???)
How can we help?

- Use communication strategies
- Use clear speech
- Consider sources of communication difficulties
- Be patient
- Repeat, then rephrase
- Provide written information

References

- Communication Disability in Aging: From Prevention to Intervention
- MarkeTrak VII: “Hearing Loss Population Tops 31 Million People”
  - Sergei Kochkin, 2004
- Guidelines for Providing Mental Health Services to People Who Are Hard of Hearing
  - Samuel Trychin (2001)
- Effects of Hearing Impairment on Use of Health Services Among the Elderly
  - Carla Green & Clyde Pope
  - Journal of Aging & Health, 2001
References

• The Consequences of Untreated Hearing Loss in Older Persons
  – The National Council on the Aging, 1999

• MarkeTrak V: “Why my hearing aids are in the drawer”: The consumers’ perspective
  – Sergei Kochkin, 2000

• Undiagnosed Pre-Existing Hearing Loss in Alzheimer’s Disease Patients?
  – Max Stanley Chartrand
  – Healthy Hearing, 2005