Geriatric Otolaryngology

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Grand Rounds Presentation
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Demographics

- During the 20th century, the number of persons in the U.S. under 65 has tripled while the number of persons over 65 has increased 11x!
- 1994 Census 1 in 8 Americans was elderly
- Census Bureau’s middle projections estimate that the elderly population will more than double by 2050, 1 in 5 Americans will be elderly
Growth of Elderly population

- Those 85 and over are the most rapidly growing elderly group
- By 2050 estimated to number 19 million
- As age increases the ratio of women to men increases because of shorter life expectancy in men reaching 5:2 over 85
- People over 65 have been estimated to have 3.5 times more medical problems than those under 65
Factors in the care of the elderly

- Multiple medical problems
- Multiple medications
- Increased sensitivity to medicines
- Psychosocial factors
  - Diminished independence
  - Diminished social interaction
  - Limited financial resources
Common Otolaryngologic Problems

- Presbycusis
- Dysphagia
- Balance disorders (presbystasis)
- Tinnitus
- Nasal complaints
- Voice
- Cancer
- Cosmetics
Hearing loss

- Presbycusis
  - Aging of the auditory system
  - Diet, nutrition, metabolism, cholesterol levels, blood pressure, arteriosclerosis, exercise, smoking, noise, emotional stress, genetic factors, toxin exposure
  - Symmetric, bilateral sensorineural hearing loss with greatest loss in the high frequencies
Hearing Loss

- 60% people over age 70 have at least a 25 dB hearing loss
- Estimated 30% have a hearing deficit that adversely affects their receptive communication ability
- Age related hearing loss affects quality of life, can lead to isolation
- Elderly commonly also have increasing problems with vision making hearing problems more of a handicap
- Sensory Presbycusis
  - High frequency down-sloping SNHL
  - Speech discrimination remains good
  - Degeneration a basal potion of Organ of Corti (predominately outer hair cells)

- Neural presbycusis
  - Flat audiogram
  - Rapid hearing loss
  - Poor speech discrimination
  - Loss of spiral ganglion cells
Metabolic Presbycusis
- Slowly progressive
- Flat audiogram
- Good speech discrimination
- Atropy of stria vascularis

Conductive Presbycusis
- Thickening of basilar membrane
- Gradual downsloping high frequency hearing loss
Progressive

Speech discrimination for similar pure tone hearing is worse in older patients than younger patients
Treatments

- Repeat testing
- Assistive devices
  - Vibrating alarm clocks
  - Flashing telephone and door signalers
  - Television listening systems
  - Personal amplifiers
- Hearing aids
Hearing aids

- An estimated 4.5 million hearing aid users
- Only 10-20% who could use them do
- 12% of people who have them don’t wear them
- Cost is prohibitive to many elderly patients
Body Aids

- Behind-the-ear (BTE)
- In-the-ear (ITE)
- In-the-canal (ITC)
- Completely-in-canal (CIC)
Types of hearing aid circuitry

- Analog
- Digitally controlled analog
- Digital sound processing
Dysphagia

- Phases of swallowing
  - Oral (reduced facial muscle strength, decreased masticatory strength, reduced tongue control, missing dentition)
  - Pharyngeal (delayed in elderly subjects, decreased pharyngolaryngeal sensory discrimination, abnormal UES function, increased penetration and silent aspiration)
  - Esophageal (decreased or absent secondary peristalsis)
Evaluation

- History: Feeding problem vs. swallowing disorder
  - Liquids vs. solids
  - Globus, halitosis, wet vocal quality, reflux, odynophagia, recurrent pneumonia, hoarseness, dysarthria
- Physical Exam
  - Examine oral cavity and upper aerodigestive tract, saliva quality/dentition/dentures
  - Neurological evaluation including arousal, orientation, cognition, cranial nerves
Most important determination is assessment of risk of aspiration

Bedside swallowing evaluation (fails to identify 33-50% of aspiration)

Barium swallow (anatomic lesions)

Modified barium swallow (dynamic view of swallowing from oral cavity to lower esophageal sphincter)

FEES – Functional endoscopic evaluation of swallowing (abnormal laryngeal elevation, epiglottis inversion, pooling, aspiration)
Causes of dysphagia

- Stroke
- Neuromuscular disease - Parkinson’s disease (pill-rolling tremor, bradykinesia, cog-wheeling rigidity), Amyotrophic lateral sclerosis
- Medications (xerostomia, mental status change, dyskinesia, GERD, esophagitis)
- Cricopharyngeus dysfunction (functional, structural, “bar” on barium swallow)
- Zenker’s diverticulum (regurgitation)
- Neoplasms
Treatments

- Swallowing therapy
- Dietary modifications
- Eliminate or reduce medications
- Gastrostomy tube placement
- Cricopharyngeal myotomy, BoTox injection of cricopharyngeal bar
- Surgical repair of Zenker’s (open vs. endoscopic)
Balance Disorders

- Difficulties with sensory function, central nervous system integration, neuromuscular and skeletal function
- 30-50% persons 65 and older fall in a given year
- 50% per year fall age 80 or older
- 1% of falls suffer hip fractures, 5% some type of fracture
- Roughly half of hip fractures are estimated to never recover normal function again
Vestibular changes with age

- Termed presbystasis
- Loss of hair cells primarily in the ampulla
- Total number of vestibular nerve axons is 37% than younger patients
- Loss of neurons in vestibular nuclei of 3% per decade age 40-90
- Reduction in gain of VOR, smooth pursuit, increase in saccade latencies
Postural stability

- Sensory (visual, hearing, vestibular, proprioceptive)
- Musculoskeletal
- Cognitive
- Integrative function
Other factors in balance disorders

- Cerebellar degeneration, Parkinson’s disease, Huntington’s disease, vitamin B12 deficiency, dementia, diabetic neuropathy, brain and spinal cord tumors, postural hypotension, cerebrovascular disease, atherosclerosis, musculoskeletal disease, metabolic disorders, cardiovascular disorders, medications, visual impairment
History
- Dizziness, dysequilibrium, vertigo
- Onset, duration, frequency, severity, provocation, associated symptoms, falls
- Medications, medical conditions

Physical exam
- Examine sensory functions, posture, gait, neurological function

Adjunctive testing
- Audiogram, electronystagmography, MRI, posturography
# Treatments

<table>
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<tr>
<th>Disorder</th>
<th>Treatment</th>
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| Vestibular labyrinthitis and/or Neuronitis | Acute  
Antibiotics or surgery if bacterial  
Antiemetics, vestibular suppressants  
Chronic  
Vestibular rehabilitation |
| Vestibular trauma                      | Vestibular rehabilitation                          |
| Vertebrobasilar insufficiency          | Antiplatelet and anticoagulation medications  
Antiplatelet medications  
Surgery PRN for decompression  
Vestibular rehabilitation |
| Cerebellar infarction                  |                                                    |
| BPPV                                  | Particle repositioning maneuver  
Additional vestibular rehabilitation PRN |
| Meniere’s disease                      | Low sodium diet and diuretic  
Surgery  
Transtympanic aminoglycoside antibiotic nerve section, sac decompression; followed by vestibular rehabilitation |
| Autoimmune inner ear disease           | High-dose steroids, cytotoxic drugs  
Bed rest, surgery |
| Perilymphatic fistula                  | Surgery followed by vestibular rehabilitation  
Vestibular rehabilitation, substitution strategies |
| CP angle tumor                         |                                                    |
| Ototoxicity                           |                                                    |
| Presbyastasis                         | Vestibular rehabilitation (head and eye movement exercises, gait and balance training) |
| Anxiety                               | Anxiolytic medications or counseling  
Exposure therapy |

BPPV = benign paroxysmal position vertigo; CP = cerebellopontine angle.

TABLE I. Common Age-Related Vestibular Disorders and Treatments.
Tinnitus

- 40 million affected in the U.S.
- 10 million severely affected
- Objective versus subjective tinnitus
Objective - Pulsatile tinnitus

- Arteriovenous malformations
- Vascular tumors
- Venous hum
- Atherosclerosis
- Ectopic carotid artery
- Persistent stapedial artery
- Dehiscent jugular bulb
- Vascular loops

- Cardiac murmurs
- Pregnancy
- Anemia
- Thyrotoxicosis
- Paget’s disease
- Benign intracranial hypertension
Objective tinnitus

- Idiopathic stapedial muscle spasm
- Palatal myoclonus
- Patulous eustachian tube
Subjective tinnitus

- Presbycusis
- Noise exposure
- Meniere’s disease
- Otosclerosis
- Head trauma
- Acoustic neuroma
- Drugs
- Middle ear effusion
- TMJ problems
- Depression
- Hyperlipidemia
- Meningitis
- Syphilis
Treatments

- Multiple treatments
- Avoidance of dietary stimulants: coffee, tea, cola, etc.
- Smoking cessation
- Avoid medications known to cause tinnitus

- Reassurance
- White noise from radio or home masking machine
Nasal Complaints

- Nasal obstruction
- Rhinorrhea
- Epistaxis
- Olfactory dysfunction
Causes

- Inflammation: decrease immune function, mucociliary dysfunction, allergy, dehydration with thickening of secretions
- Dystrophic changes: both atrophy of nasal mucosa and increase in vasomotor rhinitis are common
- Neoplasia: nasal obstruction, pain, epistaxis, rhinorrhea
- Trauma: old traumas, previous surgery
- Endocrine-metabolic disorders: hypothyroidism, decreased vitamin A and zinc
- Pharmacologic effects: diuretics, tricyclic antidepressants, antihistamines
Voice changes

- Estimated 12% of the elderly have vocal dysfunction
- Fundamental frequency of the male voice tends to increase with age
- Fundamental frequency in females decreases with age
Voice changes

- Common vocal cord findings
  - Atrophy
  - Bowed cords
  - Edema
  - Loss of collagen and elastic fibers, decrease in density of fibroblasts, atrophy of submucous glands, fibrosis, disorganization of collagen fibers
Voice changes

- Cricoarytenoid joint
  - Reduction of ground substance and cartilage matrix
  - Increase in collagen fiber density in the cartilage

- Laryngeal muscles
  - Atrophy
Neurological disorders with voice changes

- Essential tremor
- Parkinson’s disease: low volume, breathy, and monotonic
- Stroke
- Myasthenia gravis
- Amyotrophic lateral sclerosis
Treatments

- Speech therapy
- Medialization thyroplasty
- Diagnosis and treatment of underlying disorder
Cancer

- Squamous cell cancers
- Thyroid malignancies
  - Well differentiated have worse course
  - Anaplastic or undifferentiated more common
- Salivary gland malignancies
- Lymphomas
Clayman et al examined complication rates in patients 80 and older versus patients 65 and under and found no significant differences in major or minor complications.

Blackwell et al: compared free flaps in octogenarians versus younger patients and found major complications in 62% vs. 15%.
Cosmetics

- Elderly are leading more active lives for much longer than in the past
- With the explosive growth of cosmetic facial plastic surgery paired with the explosive growth of the elderly population, there will be many more “elderly” cosmetic patients
Skin - loss of tone, dynamic and static wrinkling, thinning, pigmentary changes, gravitational descent of soft tissues

- Chemical peel, laser resurfacing
- Botox injection
- Rhytidectomy

Upper third - ptosis of eyebrows and forehead

- Direct brow lift
- Pretrichial/coronal/endoscopic
- **Periorbital Region** - lower eyelid laxity, prolapsed lacrimal gland, ptosis (usually dermatochalasis)
  - Dacryoadenopexy
  - Lower lid shortening
  - Upper/lower blepharoplasty

- **Nose** – tip ptosis from loss of attachments between upper and lower lateral cartilages, loss of connections between medial crura and septum, ligamentous connections between domes of lower lateral cartilages and anterior septal angle
  - Rhinoplasty-shorten lateral crura, place septal strut

- **Lower third** – loss of premental fat pad “witches chin”, cheiloptosis, platysmal bands
  - Genioplasty
  - Lip-lift
  - Plication, imbrication, suture suspension, Z-plasty of platysma
Conclusions

- With the expected explosive growth of the elderly population, this group will become a larger proportion of patients.
- The otolaryngologist must consider the patient’s health and well-being as a whole, especially in this group of patients who often have multiple problems.
Sources


