Slide 1 – name

Slide 2 – outline

Slide 3 - Anatomy of the ear:

Outer ear – pinna, auditory canal, tympanic membrane

Middle ear – malleus, incus, stapes (these 3 bones = ossicles), eustachian tube (connects ear to nasopharynx)

Inner ear – semicircular canals, vestibule, cochlea, vestibulocochlear nerve (CN VIII) = auditory nerve to brainstem

Slide 4 - Healthy ear can hear sounds transmitted in air better than those conducted by bone as ossicles in middle ear amplify sound waves in air

Slide 5 - Problem transmitting sound waves in outer or middle ear – outer ear, tympanic membrane or ossicles

External canal obstruction 🡪 foreign body/impeded wax/discharge/oedema (OE/OME), usually sudden unilateral hearing loss, removal (irrigate or curette) of wax/FB

Tympanic membrane perforation 🡪 sudden painful hearing loss & suggestive history. o/e perforated ear drum. Rx 1) small <2mm = heal spontaneously +-topical abx cover 2) larger >=2mm myringoplasty (ear drum replacement)

Eustachian tube problems 🡪 effusion etc block sound wave conduction

Acute mastoiditis 🡪 complication of otitis media/cholesteatoma, swollen and painful mastoid and push pinna forward and down. Ix CT scan. Rx IV Abx +- surgical drainage

Otosclerosis 🡪 see next slides

Cholesteatoma 🡪 see next slide

Slide 6 - Genetically mediated metabolic dysplasia

Sclerosis = hardening

Ankylosis = stiffening/immobility of joint

Sx worsen in pregnancy and menstruation due to increased oestrogen levels

Rx = surgical a) stapedectomy = removal of footplate

b) Stapedotomy = small hole in stapes footplate to enable mobility of joint

Slide 7 - Retraction pocket into middle ear, lined by squamous epithelium

Bone erosion: locally invasive/destructive 🡪 erodes ossicles, vertigo, facial paralysis

Slide 8 - AIR CONDUCTION DOWN EXTERNAL CANAL AND MIDDLE EAR IMPAIRED

SOUNDS CONDUCTED BY BONE > AIR

Slide 9 - When cochlea or auditory nerve defective 🡪 unable to transmit neuronal impulses to auditory cortex of brain

1. Ototoxicity – several drug classes damage inner ear 🡪 aminoglycosides (gentamicin), quinine, some macrolide abxs (azithromycin, clarithromycin), salicylates
2. Meniere’s disease – disease of inner ear 🡪 increased fluid in labyrinth of inner ear (will discuss in vertigo section)
3. Infections – viral and bacterial eg encephalitis, meningitis, labyrinthitis, varicella zoster, **MUMPS**

Slide 10 - Sensorineural hearing loss audiogram

Unilateral auditory nerve damage (eg damage due to acoustic neuroma) 🡪 reduced hearing for both air AND bone conduction

Slide 11 - Slow insidious onset

Person struggles hearing in noisy environments/background noise & difficulty understanding speech

O/E – ear normal

Audiometry: loss of hearing sounds at high frequencies

Slide 12 - Exposure to excessive sounds eg fireworks, bombs, loud music (often related to occupation)

Audiogram = trough at 4kHz

O/E – ear and TM normal

Slide 13 - Mostly vestibular portion of nerve

SUSPECT ACOUSTIC NEUROMA 🡪 UNILATERAL OR ASYMMETIRCAL HEARING LOSS/TINNITUS, IMPAIRED FACIAL SENSATION (INVOLVEMENT TRIGEMINAL NERVE), BALANCE PROBLEMS WITHOUT OTHER EXPLANATION

As tumour spreads 🡪 involvement of facial nerve, compressions of cerebellum or brainstem (rare but can happen)

MRI preferred as can detect small tumours but if not tolerated or unavailable CT fine

Small tumour with mild sx – watch and wait as treatment can cause permanent side effects

Radiotherapy – may shrink and stop neuroma growing

Large tumours resected by microsurgery

Slide 14 - Peripheral = vestibular labyrinth, semi-circular canals, vestibular nerve

Central = brain stem, cerebellum, cerebral cortex

Slide 15 - Benign Paroxysmal Postural Vertigo

Inner ear dysfunction

Otolith = small calcium carbonate crystals which put pressure on cilia which stimulate hair cells when head moves. Present in endolymph of vestibular system

Head movements – turning over in bed, lying down, sitting up, leaning forward

DIX HALLPIKE TEST – rapidly move the patient from a sitting position to the supine position with the head turned 45° to the right. After waiting approximately 20-30 seconds, the patient is returned to the sitting position. If no nystagmus is observed, the procedure is then repeated on the left side. +ve result = patient experiences vertigo and rotatory nystagmus

Advise people not to drive

EPLEY’S MANOEUVRE = repositional manoeuvre – aim = otoliths back into urticles

PROCHLORPERAZINE = vestibular sedative

Slide 16 - Disorder of inner ear, long term condition

Distension 🡪 injury to vestibular system 🡪 vertigo AND hearing loss

Slide 17 - Dizzy at rest and feels worse with any head movement

o/e – Head Impulse test – turn pt’s head rapidly to affected side 🡪 +ve if pt unable to maintain visual fixation

Bed rest – avoid stimulants eg coffee, alcohol, lie still in comfortable position, avoid bright lights, decrease noise and stress around

Complications = FALLS, UNILATERAL HEARING LOSS, BPPV.

Nystagmus Type – spontaneous nystagmus

Skew deviation – movement of eye suggests central cause of vertigo

Slide 18 - Bacterial = staph aureus, p.aeurginosa

Fungal = aspergillus, candida

OE extends to mastoid and temporal bones 🡪 granulations – erodes bone and cartilage 🡺 later involves CNS (VII+IX-XII)

Slide 19 - As children grow bigger – angle between eustachian tube + wall of pharynx = more acute 🡪 therefore younger children = facilitates infected material being transmitted through eustachian tube 🡪 middle ear.

Slide 20 - Hearing loss in children = loss of concentration, withdrawal, impaired school progress, impaired S&L development, poor behaviour, mishearing, TV on loud

Tympanogram = graphic representation of the relationship between the air pressure in the ear canal and the movement of the eardrum, or tympanic membrane, and the tiny bones in the air-filled middle ear space. Used to test the condition of the middle ear and mobility of the eardrum and the conduction bones by creating variations of air pressure in the ear canal.

Grommets = ventilation tubes – may become blocked 🡪 blood + secretions = discharge >2days – topical abx needed

Post insertion 🡪 tympanosclerosis common, CAN SWIM and FLY, may naturally extrude post insertion

Slide 21 – Mastoid = bony process 🡪 inferior extension of petrous temporal bone

3rd gen cephalosporin = cefotaxime, ceftriaxone

Intracranial spread – extradural abscess, meningitis, cerebral abscess,

Slide 22 – ACUTE: 1) Can have bacterial superinfection – s.pneumoniae, h.influenzae, Moraxella catarrhalis

2) ABX – 1st line amoxicillin PO 7days, 2nd line co-amox 7days PO

CHRONIC: 1) Predisposing factors = allergic rhinitis, asthma, IC, dental infection, churg strauss, wegner’s

Slide 23 – Cortical innervation to forehead = bilateral (x2 UMN)

Cortical innervation to lower face = unilateral and contralateral

Hyperacusis as CNVII innervates stapedius muscle = dampens vibrations of stapes and protects ear from loud noises and innervates lacrimal duct

Ramsay Hunt Syndrome = aka shingles of facial nerve

Reactivation of latent VZV in dorsal root ganglion

Sx of facial palsy worse with RHS

Slide 24 - Viral = rhinovirus, coronavirus, influenza, parainfluenza, adenovirus

Laryngitis 🡪 fungal = candidiasis

Meds – ACEI, inhaled steroids, antihistamines (dry mucosa), bisphosphonates

Acute 🡪 vocal hygiene = rest voice, humidification, avoid smoking, hydration

Slide 25 - N.B tonsils tend to atrophy in early adulthood

Tonsils = most important lymph tissue protecting upper airways

If penicillin allergic = clarithromycin PO 10 days

TONSILLECTOMY – usually if >= 5 episodes per year, sx>= 1 yr, decreased QOL = prevent normal functioning

Slide 26 - Large, cervical LNs.

Ix 🡪 positivity increase during first 6 weeks of illness, therefore maybe –ve early in course of EBV IM. Bloods – thrombocytopenia, increased WCC

Slide 27 - Complications: necrotising fasciitis, recurrence, death 🡪 aspiration, airway obstruction, erosion into major blood vessels/mediastinum

Slide 28 - Viral – mumps, coxsackie, parainfluenza, influenza

Bacterial – staph aureus

Sialography – for blockage 🡪 contrast into gland and xray

CT/MRI – exclude neoplasm

Slide 29 – n/a

Slide 30 – questions?