Pharmacological Interventions for dizziness

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First a caution

- Torok N. Old and new in Meniere's disease. Laryngoscope 87:1870-1877, 1977
- 600 treatments reviewed ranging from spinal fluid drainage to numerous medications.
- Nearly all had 60% efficacy (natural history)
- A lot of these medications may be placebo's

Processes we might try to treat

- Vertigo (nystagmus)
- Motion sickness, emesis
- Compensation

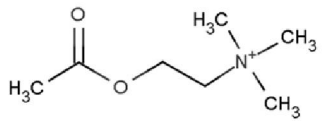
Processes we might NOT try to treat with medications

- Sensory ataxia (such as ototoxicity, blindness, B12 deficiency)
- BPPV (best managed with physical treatments)
- Malingerers (drug treatment facilitates them) – altho there are some tricks – the "tiny dose" approach.

Main drug categories for dizziness

- Anticholinergic
- GABA agonists
- Everything else

Anticholinergics



- Block central and peripheral ACH
- Reduce vertigo and nausea from peripheral vertigo
- Reduce central nystagmus (in very high doses)
- Numerous interesting side-effects à

Scopolamine
Muscarinic antagonist

- Scopolamine (Transderm-Scop patch), Scopase (oral version)
- Transderm does not require ingestion (but many other oral GI drugs do same thing – Levsin and Robinul for example). Nothing magic about patch.
- Apply every 3 days to skin surface
- Withdrawal syndrome and CNS side effects limit use

Anticholinergic side effects (Locoweed poisoning)

- Confusion (similar to drug induced Alzheimer's)
- Dry mouth, loss of sweating
- Urinary hesitancy/stoppage. Constipation
- Blurry vision
- Cardiac conduction block
- Addiction

Oxytropis lambertii

H1-antihistamines with strong anticholinergic properties

- meclizine (Antivert)
- dimenhydrinate (Dramamine)
- diphenhydramine (Benadryl)

Antihistamines must cross BB barrier -- i.e. Claratin, Allegra do not work for dizziness

Antihistamine side effects

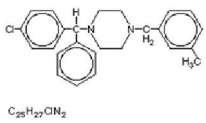
- Sleepiness
- Weight gain

Anticholinergic side effects

- Dry mouth and eyes
- Constipation
- Confusion

meclizine (Antivert, Bonine)

- 12.5 TID or 25 TID. Lasts about 8 hours. Available OTC.
- Limitation is sedation and anticholinergic side effects
- Pregnancy: category B. May be best drug



$C_{25}H_{27}ClN_2$

GABA agonists (benzodiazepines)

- Modulate inhibitory transmitter GABA
- Reduce vertigo and nausea from peripheral vertigo
- Reduce nystagmus
- Sedation, addiction limit usefulness
- ? May impede compensation (strangely, no evidence in humans for this – may actually do opposite)

Benzodiazepines

- Valium (diazepam, “Mothers little helper”)
- Ativan (lorazepam)
- Klonapin (clonazepam)

Benzodiazepines

- Marginally useful benzodiazepines
  - Halcion (very short acting)
- Benzodiazepines to discourage
  - Alprazolam (xanax) (addiction)
  - Tranzene (too long acting)
  - Valium in 5mg+ doses (abuse)

Dosing: beer scale
1 glass of beer =

- 2 mg of Valium
- 0.5 mg of Ativan
- 0.5 mg of Klonapin

Benzodiazepines
Bottom line

Extremely useful drugs

Treat dizziness and anxiety

Addiction is the big problem

Diuretics

- Dyazide and Maxide (Hctz+triamterine)
  - Menieres
- Diamox (acetazolamide)
  - Menieres
  - Migraine
  - Periodic ataxia
- Lasix
  - Not a good idea – causes hearing loss and hypokalemia

Drugs of unclear utility
(perhaps as a last resort)

- Beta-histine (Serc) à
- Baclofen (occasionally useful)
- Alternative medications
  - Vertigo-HEEL (homeopathic)
  - Ginkgo-Biloba (very weak evidence)

Betahistine (Serc)

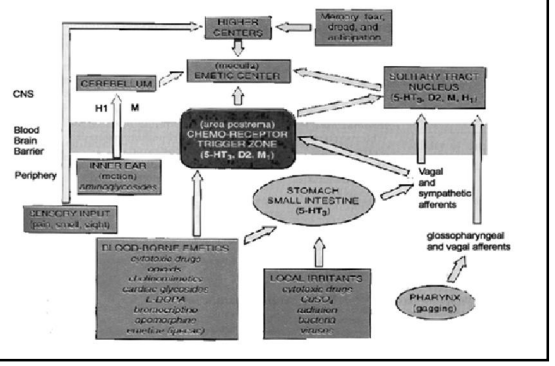
- FDA position is that it is a placebo
- Readily available from compounding pharmacies, including any Walgreens
- Weak H1 agonist and H3 blocker (which results in some Histamine agonism)
- Author's experience – Useful for motion intolerance and Meniere's.

•Kingma H, Bonink M, Meulenbroeks A, Konijnenberg H. Dose-dependent effect of betahistine on the vestibulo-ocular reflex: a double-blind placebo controlled study in patients with paroxysmal vertigo. Acta Otolaryngologica 117(5):641-6, 1997

Emesis

FIGURE 1.—*Egyptian lady vomiting.*

Vomiting is complex



Drugs used for treatment of emesis

MOST IMPORTANT

- 5-HT3 antagonists
- Dopamine blockers
- Anticholinergics (OTC)
- H1 antihistamines
- Benzodiazepines

odansetron (Zofran) 5HT3 receptor antagonist

- Dose: 8 mg PO. MLT form is fast acting
- Category B in pregnancy (probably safe)

Dr. Hain's drug of choice to use prior to nauseating PT session.
generic is available

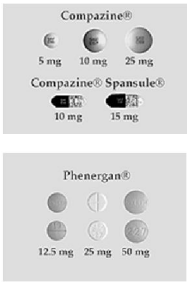
Commonly used phenothiazine antiemetics dopamine blockers

prochlorperazine (Compazine)
5, 10 and 25 mg forms, including rectal suppositories.
Pregnancy -- unknown

promethazine (Phenergan).
12.5, 25, 50 mg forms, including rectal suppositories
12.5 BID prn oral dose typical. Pregnancy Cat. C

Commonly used phenothiazine antiemetics dopamine blockers

•Powerful drugs
•Major side effects
•Use if you have a big vomiting problem



Compensation

Compensation -- subtypes

- Static compensation – recovery from tone imbalance (vertigo).
  - Largely automatic and not likely to be modified by drugs.
- Dynamic compensation (oscillopsia) – readjust gain.
  - Takes some time, modifiable by medications.

Compensation -- goals

- Facilitate compensation for static vestibular lesions or central problems. (i.e. vestibular neuritis, bilateral loss)
- Halt compensation for transient vestibular lesions (i.e. Menieres attack).

Drugs that accelerate dynamic compensation (in animals)

- Amphetamines
- Bromocriptine (Dopamine agonist)
- ACTH (adreno-corticotrophic hormone)
- Caffeine

Modified from Brandt, 1991

Drugs that retard dynamic compensation in animals

- Phenobarbital (sedative, barbituate)
- Dopamine antagonists (e.g. Lisuride, Thorazine)
- ACTH antagonists (e.g. steroids). Steroids seem to help in people !
- Diazepam, (GABA agonist, Valium). No evidence for this in people.

Modified from Brandt, 1991

No pain – no gain ?
or:
Do rat studies apply to people ?

- Drugs that make people more comfortable often impede compensation in animals.
- Animal studies suggesting that medications impede compensation are generally not replicable in people.

Summary

- Large and complex pharmacology
  - Vertigo
  - Emesis
  - Compensation
- Nearly always will there be an opportunity to explore a different avenue with any particular patient

More details

Hain TC, Yacovino D. Pharmacological Treatment of Dizziness. Continuum Neurotology Issue (Tusa R editor), 2006.

www.dizziness-and-hearing.com