

## Drug treatment of 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 with medications

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

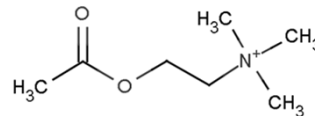
## Processes we might NOT try to treat with medications

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

## Main drug categories for vertigo

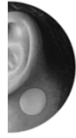
- Anticholinergic
- GABA agonists
- Everything else

## Anticholinergics



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

## Scopolamine Muscarinic antagonist



- Scopolamine (Transderm-Scop patch)
- Transderm does not require ingestion (but many other oral GI drugs do same thing – Levsin and Robinul for example).
- 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 with dizziness on withdrawal



*Oxytropis lambertii*

## H1-antihistamines with strong anticholinergic properties

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

Antihistamines must cross BB barrier -- i.e. OTC  
fexofenidine, loratidine, cetirizine do not work for  
dizziness

## Antihistamine side effects

- Sleepiness
- Weight gain

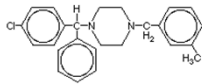


## Anticholinergic side effects

- 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<sub>26</sub>H<sub>27</sub>ClN<sub>2</sub>



## 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)

## Benzodiazepines

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



## Benzodiazepines

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

## Dosing: beer scale 1 glass of beer =

- 2 mg of diazepam (Valium)
- 0.5 mg of lorazepam (Ativan)
- 0.5 mg of clonazepam (Klonopin)



## 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) →
- 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.

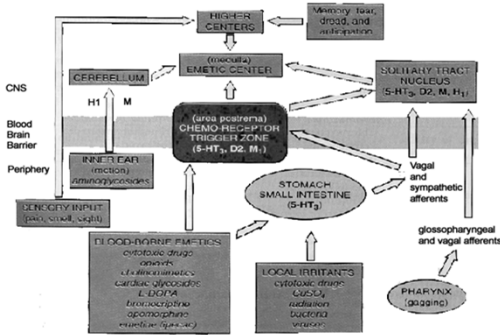
\*Kingma H, Bonink M, Meulenbroeks A, Konijnenberg H. Dose-dependent effect of betahistine on the vestibulo-ocular reflex: a double-blind placebo controlled study in patients with paroxysmal vertigo. Acta Otolaryngologica 117(5):641-6, 1997

## Emesis



FIGURE 1.—Egyptian lady vomiting.

## Vomiting is complex



## Drugs used for treatment of emesis

- MOST IMPORTANT**
- 5-HT<sub>3</sub> antagonists
  - Dopamine blockers
  - Anticholinergics (OTC)
  - H1 antihistamines
  - Benzodiazepines

## ondansetron (Zofran) 5HT<sub>3</sub> receptor antagonist

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



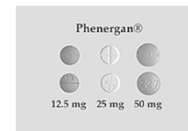
**Dr. Hain's drug of choice to use prior to nauseating PT session. generic is available**

## Commonly used phenothiazine antiemetics dopamine blockers

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

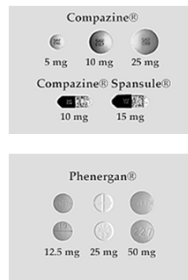


promethazine (Phenergan).  
12.5, 25, 50 mg forms, including rectal suppositories 12.5 BID prn oral dose typical. Pregnancy Cat. C



### 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 Neurology Issue (Tusa R editor), 2006.

[www.dizziness-and-hearing.com](http://www.dizziness-and-hearing.com)