

Drugs 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 with medications

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

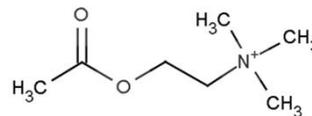
Processes we might NOT try to treat with medications

- Sensory ataxia (such as ototoxicity, blindness, B12 deficiency)
- BPPV (best managed with physical treatments)
- Malingerers (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, Bonine)
- 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

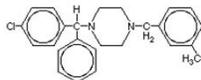


Anticholinergic side effects

- 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



$C_{26}H_{27}ClN_2$



GABA agonists (benzodiazepines)

- Modulate inhibitory transmitter GABA
- Reduce vertigo and nausea from peripheral vertigo
- Reduce nystagmus
- Sedation, addiction limit usefulness
- These are controlled substances
- ? 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

Useful drugs

Treat dizziness and anxiety

Addiction is the big problem

Best to limit to less than 0.5 mg/day

Diuretics

- Dyazide and Maxide (Hctz+triamterine)
 - Menieres
- Diamox (acetazolamide)
 - Menieres
 - Migraine
 - Periodic ataxia (i.e. EA2)
- Lasix
 - Not a good idea – causes hearing loss and hypokalemia

Drugs of unclear utility

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

Betahistine (Serc)

- FDA approved for compounding only
- Readily available from compounding pharmacies, including Walgreens
- Weak H1 agonist and H3 blocker (which results in some Histamine agonism) and H4 blocker.
- Author's experience – Useful for motion intolerance and Meniere's.

*Kügma H, Boniak 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

*See also FDA docket in 1999, 35162.nf

Emesis

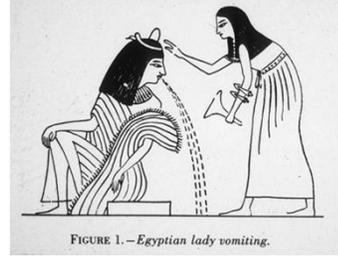
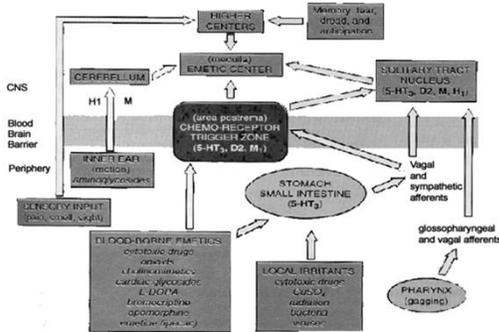


FIGURE 1.—Egyptian lady vomiting.

Source: Nasa Symposium

Vomiting is complex



Drugs used for treatment of emesis

MOST IMPORTANT

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

ondansetron (Zofran) 5HT₃ receptor antagonist

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



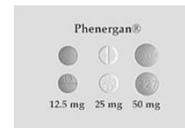
Dr. Hain's drug of choice to use prior to nauseating PT session.
Generic non-MLT is available (\$.35/pill)

Commonly used phenothiazine antiemetics dopamine blockers

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

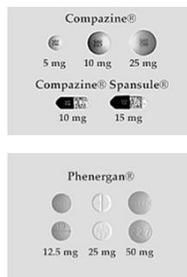


promethazine (Phenergan).
12.5, 25, 50 mg forms, including rectal suppositories
12.5 BID pm oral dose typical. Pregnancy Cat. C



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

Soto E, Vega R, Emmanuel S. Neuropharmacological basis of vestibular system disorder treatment. J. Vest Res 23 119-137, 2013.