Pharmacological Interventions for dizziness

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First a caution

- 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)
- BPPV (best managed with physical treatments)
- Malingering (drug treatment facilitates them)

Neurotransmitters

<table>
<thead>
<tr>
<th>Neurotransmitter</th>
<th>Peripheral</th>
<th>Central</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetylcholine</td>
<td>Excitatory</td>
<td>Excitatory</td>
</tr>
<tr>
<td>GABA</td>
<td>?</td>
<td>Inhibitory</td>
</tr>
<tr>
<td>Histamine</td>
<td>?</td>
<td>Excitatory ?</td>
</tr>
<tr>
<td>Dopamine</td>
<td>?</td>
<td>Excitatory</td>
</tr>
<tr>
<td>Norepinephrine</td>
<td>?</td>
<td>Modulator ?</td>
</tr>
<tr>
<td>Glutamate</td>
<td>?</td>
<td>Excitatory</td>
</tr>
<tr>
<td>Serotonin</td>
<td>(stomach)</td>
<td>Excitatory ?</td>
</tr>
</tbody>
</table>

Main drug categories

- 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)
- Does not require ingestion (many other oral GI drugs do same thing – Levsin 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

H1-antihistamines with strong anticholinergic properties

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

Antihistamines must cross BB barrier – i.e. Claratin, Allegra would not work

Antihistamine side effects

- Sleepiness
- Weight gain

Anticholinergic side effects

- Dry mouth and eyes
- Constipation
- Confusion

Meclizine (antivert)

- 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

Oxytropis lamberti
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

- Diazepam (Valium, “Mothers little helper”)
- Lorazepam (lorazepam)
- Klonapin (clonazepam)

Benzodiazepines

- Marginally useful drugs
  - Halcion (very short acting)
- Drugs to avoid
  - Alprazolam (xanax) (addiction)
  - Tranzene (too long acting)
  - Valium in large 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
Drugs of unclear utility (perhaps as a last resort)

- Beta-histine (Serc)
- Baclofen
- Memantine
- Alternative medications
  - Vertigo-HEEL
  - Ginkgo-Biloba

Betahistine (Serc)

- FDA position is that it is a placebo
- Available from compounding pharmacies and overseas (though made in US)
- Weak H1 agonist and H3 blocker (which results in some H agonism)
- Author’s experience – definite utility for motion intolerance and Meniere’s.

Emesis

Drugs used for treatment of emesis

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

**Commonly used phenothiazine antiemetics**

- 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

odansetron (Zofran)
5HT3 receptor antagonist

• Dose: 32 mg IV, 4-8 mg PO. MLT form
• Category B in pregnancy

Dr. Hain’s drug of choice to use prior to nauseating PT session.
Costs a LOT but generic is available

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
• TRH

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


www.dizziness-and-balance.com