

Systemic Management of Nausea: Antiemetics

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Antiemetics: This is for controlling nausea and vomiting. These are multiple conditions that's causing this. It's kind of common. I'm sure all of you have experienced some yourself of being nauseous. I'm sure all of you with children have been able to clean up after them at least once when they been sick. It does affect the quality of life and millions of patients every year.

If we are going to treat this, of course it's like most things, we want to treat the underlying cause as well as the effect.

How do we vomit? There's a physiological vomiting center in the medulla that directly mediates the nausea and vomiting.

So how many knew they had a vomiting center? It's actually a place there.

It gets stimulated by three different pathways.

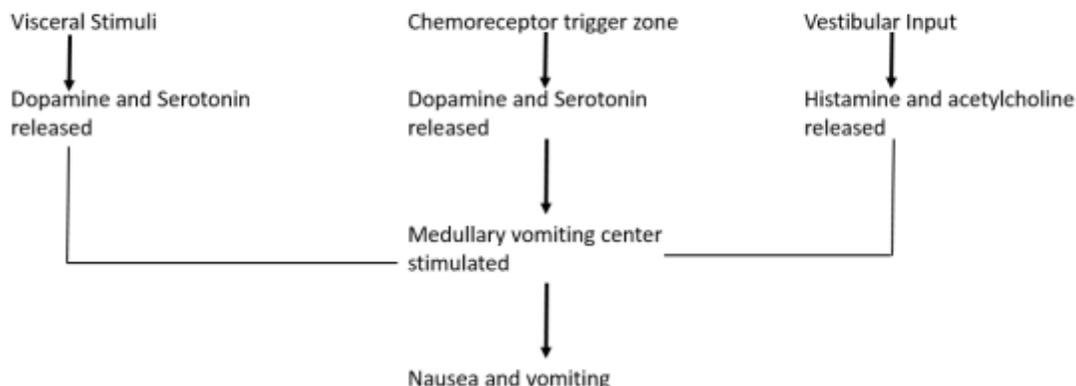
1. Vestibular Fibers
2. Visceral
3. chemoreceptor trigger zone, base of the fourth ventricle

So all of these are different.

But the way they trigger down here can be the same or different with medication.

The vestibular, it's histamine and acetylcholine, those are the chemicals that are used. The chemoreceptor trigger zone is the same as the visceral: it's dopamine and serotonin. (*see figure below*)

Etiology of Nausea and Vomiting



Well, all of them come down to the vomiting trigger zone and [...] there it goes. And we have an upset stomach and we react.

[from slide]

Common In Office Problems

- ❖ *Nerves*
- ❖ *Drugs*
- ❖ *Migraine HA*
- ❖ *Motion Sickness*

Nerves

So how's that affect us in the office? Well we have people that will blackout. I remember when I was taking a contact lens course, we had an eye doctor that put the fear in us that we better learn everything. I remember this particular one. He says "when you get ready to put a contact lens on a patient, some of them will just blackout on you." It's so nerve wrecking to them to have something against their eye. He says "well whatever you do, before they wake up, put the contact lens in their eye." *[laughs from audience]*

Well the fact is really, you need to make sure the patient is safe. You don't let them fall.

Not only can they blackout, they can puke. I've made a few really stupid mistakes. I don't mind sharing this because I hope you don't [make the same mistakes]. I was doing a LASIK eval on a nice young lady.

She says "I'm starting not to feel too good."

I look at her; pretty ashen face. She's in the chair; she's against the slit lamp. I have about ten seconds left to finish the exam and I'm done. I decided to finish. That was really poor on my part because she threw up. She was terribly embarrassed. I looked at her and say "that's not your fault. It's mine." Luckily, we have surgical garments and we were able to let her change her clothes. I thought "what a terrible thing? What a burden to put on the patient" and it was really my fault. So make sure when patients start getting nervous and they start looking like that, realize that they can throw up.

Other things that can happen. [...] All through this, you're going to have all these courses going back and forth, and we all overlap. Drugs can cause you to want to throw up.

Migraine headaches

How many are migraine headache patients here? You ever feel an upset stomach? How upset? *[audience member answers]*. Yeah, I've had a few of those too. Do you know before you're going to vomit? *[audience member answers]*. You know it's getting upset, don't you? And the headaches thumping pretty hard, isn't it?

Motion Sickness

Tell you a little more about that in the future because that turned a cruise trip into a nightmare for me. Has anybody had motion sickness? I remember my first case as an optometrist that was kind of tricking my mind. I have a father that brought in his young boy, 12 years old; one pupil dilated, non-reactive [and] the other one's fine. He goes "he just got this way".

Did he have any head injury? Has he been taking any medication; any eye drops?

"No."

Has he been to a doctor lately?

"No."

I think this is chemical and after I got through doing a full work up, trying to get through absolutely every history, I finally tell him, "I think he got something on his hand and rubbed his eye. (He was mowing the lawn.) We are going to wait and see. I'm not going to send you to the hospital yet."

When I started saying medication, he [the father] says "you know, he has motion sickness, and he put a little patch on the back of his ear."

But I had asked everything about medications until I said that. All of a sudden it clicked for him. So that's scopolamine.

Vestibular or CNS induced associated neurotransmitters: histamine and acetylcholine.

So the ear is going to do histamine and acetylcholine. How are we going to treat it? We are going to treat it with antihistamines and anticholinergics (equally effective).

Gastroenteritis induced associated neurotransmitters: dopamine and serotonin.

Now the visceral is the core body. It secretes the dopamine and the serotonin. So first line agents for this though is usually dopamine [antagonists]. Second line agents would be the serotonin antagonists (use in children controversial).

Migraine Headache associated neurotransmitters: dopamine (probably a primary mediator).

Well to treat both the headache and the nausea, which is a good idea, metoclopramide (Reglan) or prochlorperazine (Compazine) are readily available. Compazine has been around forever.

For nausea, same thing, but you can use the serotonin antagonists [and metoclopramide or prochlorperazine].

Now some of these drugs, we will go through them later on.

Different drugs come in different forms. This isn't necessarily true for migraines but when you're vomiting, if something can't stay down, you may want to remember that you can be able to give this as an IV. You know, this could be given as a suppository.

Postoperative Nausea and Vomiting associated neurotransmitters: dopamine and serotonin.

Well if the patient leaves the surgical center and comes back to your office about four hours later and [the patient is nauseous]. After having medication and surgery, a lot of time dopamine and serotonin will be transmitted. Again you will have to be able to prescribe either the [dopamine or serotonin] antagonists. You can also use a steroid: dexamethasone can work usually in conjunction with serotonin antagonist.

What are some of the more common antihistamine agents?

- ❖ Buclizine (Bucladin-S)
- ❖ Cyclizine (Marezine)
- ❖ Dimenhydrinate (Dramamine)
- ❖ Diphenhydramine (Benadryl)
- ❖ Meclizine (Antivert)

We already know the bottom three [Dramamine, Benadryl, Antivert]. We see those all the time. Those are the most common. Meclizine (Antivert) is used a lot in older patients by their MDs. Those that just don't seem to be able to have their balance. We don't know why but in older patients, sometimes that happens and man it really goofs them up. Antivert is one of the number one drugs used for that. There's really no treatment for it other than that. We really don't know what causes that problem. That's another lecture.

Benadryl [and Dramamine] we all know. Dramamine is probably used more for motion sickness than most of the other things.

We already talked about Scopolamine (Transderm Scop) patch [which is an anticholinergic agent]. [...] We went on an Alaskan cruise and one of my friends says "you guys [have] your Scopolamine patches"" I thought "I've been out on the sea and swells there. I think I will be all right."

My wife says "should I get one?"

"Why don't you wait and see how bad you get?"

It's the Alaskan passageway. Every picture I've seen is how smooth it is. That's how I got into trouble. I didn't get mad about it all but she did and she was very upset that she didn't have the Scopolamine patch on before. We did get one on her and she took some Dramamine and then we were okay. But [she] wasn't really wanting to talk to me for a while. By the end of the voyage we were okay.

What are some of the dopamine antagonists?

- ❖ Chlorpromazine (Thorazine)
- ❖ Droperidol (Inapsine)
- ❖ Metoclopramide (Reglan)
- ❖ Prochlorperazine (Compazine)
- ❖ Promethazine (Phenergan)
- ❖ Trimethobenzamide (e.g. Tigan)
 - For children under 12 y.o.
 - 100 mg pr q 6 h prn

Phenergan is probably used more than the others. Tigan is a really wonderful for children.

Serotonin Antagonists

- ❖ Dolasteron (Anzemet)
- ❖ Granisetron (Kytril)
- ❖ Ondansetron (Zofran)

Most of the time you don't give serotonin antagonists. The Kytril and Zofran, I have seen that, [but] I have never used it.

What other type of agents can we use?

- ❖ Dexamethasone
- ❖ Methylprednisolone (Medrol)
- ❖ Trimethobenzamide (Tigan)

Major adverse effects of antiemetic agents. These are ones you need to know.

Antihistamines and anticholinergics are the ones that you are going to be prescribing more than anything else. [The adverse effects antihistamines and anticholinergics are] sedation, urinary retention, blurred vision, exacerbation of narrow-angle glaucoma*

Major adverse effects of dopamine antagonists: sedation, extrapyramidal effects, QT prolongation, severe hypotension; rarely seizures, agranulocytosis, neuroleptic malignant syndrome, blood dyscrasias

- F-Fever
- E-Encephalopathy
- V-Vitals unstable
- E-Elevated enzymes (elevated CPK)
- R-Rigidity of muscles

Major adverse effects of serotonin antagonists: QT prolongation, QRS widening; rarely hypersensitivity reactions.

Bottom line: we can only treat conditions related to the eyes. Now can you prescribe to a patient that's ready to go on a cruise and give them Scopolamine patches in advance? No. You're not treating the eyes. We have the knowledge. We don't have the licensure. Make sure that what you prescribe is what you are licensed for.