Ondansetron and Extrapyramidal Effects

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Objectives

- Educate the peri-operative nurse regarding the extrapyramidal side effects of ondansetron.
- Provide current pharmacological review of medications used for PONV
- Apply Benner’s Theoretical Framework for the educational intervention
- Identify presenting clinical symptoms for recognizing extrapyramidal side effects
- Identify current drug regimens used to treat extrapyramidal side effects
Ondansetron

Most popular antiemetic for prevention/treatment of PONV

- Given to many patients regardless of history of PONV
- Despite the increasing extrapyramidal effects, it is still used by the peri-operative nurse
PONV

- A big concern to the surgical patient
- Affects 20-30% of the surgical patients
- Causes stress and anxiety to the patient
- Can predispose the patient to an extended hospital stay and increased healthcare costs
PONV

- The vomiting center is the central emesis center located in the midbrain.
- The CTZ has a direct impact connection to the vomiting center and receives stimuli from various receptors in the body.
- Specifically, vagal mediated input from the gastrointestinal tract stimulates the vomiting center as found post operatively and frequently after surgery (Broad & Broad, 2006).
Evidence Based Process

- Nursing knowledge is inconsistent regarding prevention and treatment of PONV
- Patient safety a big concern as a result of extrapyramidal effects
- Explore other pharmacologic options for prevention and treatment of PONV
Theoretical Framework

- Benner’s theory is the foundation of this educational intervention
- Suggests that nurses learn through education and clinical experience over time
- Building on established knowledge and skills to develop a deeper understanding of new concepts and skills
- Benner believes nurses learn by collaborating with other nurses in the process
The Question...

- Will Educating peri-operative nurses on the extrapyramidal side effects of ondansetron improve their knowledge following an educational intervention designed to enhance patient safety?"
Extrapyramidal effects of ondansetron

- Oculogyric crisis
- Seizures
- Dystonia
Ondansetron

- Ondansetron is currently available for both oral and parental administration. It binds to the 5-HT receptor and has a rapid onset of action, with a half-life of 3.5-5.5 hours.
- Ondansetron is administered according to weight. The dosage of 0.1 mg/kilogram (KG) is used for patients under 40 kg and 4 mg is usually administered for any weight above 40 KG.
- In patients who do not achieve adequate relief of PONV after 4 mg of IV Ondansetron, a second dose of IV 4mg has not been found to provide additional control of nausea and vomiting (Board & Board, 2006).
The first 5-HT antagonist, ondansetron, was approved by the United States Food and Drug Administration (FDA) in 1991 for the treatment of chemotherapy induced nausea and vomiting.

Ondansetron exclusively is in the algorithm for preventing and treating PONV in the perioperative setting because the drug peripherally blocks the gut vagal afferent fibers thus preventing PONV (Moon, 2014).

Ondansetron affects both receptors in the gastrointestinal tract and in the brain stem and thus is effective for both prophylaxis and treatment of PONV (O’Brien & Wagner, 2009).
Extrapyramidal Effects

- Although the incidence of extrapyramidal reactions to ondansetron have been reported to be approximately 0.2% in the general population, yet it can reach as high as up to 25% in the elderly and young adult patient (Jo et al.).

- The extrapyramidal symptoms have been encountered with the recommended dose of ondansetron 4mg intravenous (IV) route and can occur within 10 minutes of administration up to 24-72 hours post administration (O’Brien & Wagner, 2009).
Treatment of Dystonic Reaction

- Benadryl 25 mg IV and cogentin 1 mg IV
- Symptoms resolve within 2 hours of administration
- Patient usually admitted for an overnight observation following incidence
Multi Modal PONV Approach

- Nurses caring for the peri-operative patient should have an understanding of how different antiemetic medications act on their associated receptors in the brain.
- As such, repeating the same antiemetic is not an effective option because different drugs affect different receptors (O'Brien & Wagner, 2009).
- A multi-modal technique for preventing and treating PONV technically, literature supports this as the best approach.
- Options:
  - Granisetron 1 mg PO/Scopolamine Patch
  - Decadron 4-12 mg IV
  - Robinol 0.2 mg
Continued

- Hydrate patient with lactated ringers/0.9% NSS
- TIVA for anesthetic
- Limit narcotics
- Eliminate using nitrous oxide
The patient at higher risk for PONV

- Female
- History of PONV with previous anesthetic
- Non-smoker
- History of motion sickness
Literature Review/Discussion

- Singh & Rai
- Patel
- Bruce
- Hambridge
- Chimbira and Sweeney
- Ramakrishna, Trentman, Hall, and Sprung
- Sharma & Raina
- Size & Rubin
Dr. Colozzi’s Purpose Statement: Improving peri-operative nursing knowledge with regard to antiemetic timing of the intervention.

“There is a great good that could come from influencing providers to weigh the risk – benefit with regard to their current practice of giving ondansetron to every patient at a time when they display no symptoms during the intra-operative period.”
Let’s consider what we know:

- Over the past 3 years we have had over 20 cases of extrapyramidal dystonia ranging from involuntary muscle movements of the limbs to inability to articulate and follow commands.
- IV Benadryl 25-50 mg and Cogentin 1-2 mg will abolish the dystonia.
- It is extremely upsetting and frightening to the afflicted patient.
- It is being reported nationally in increasing numbers.
- Ondansetron is an excellent drug for treating nausea.
Let’s consider what we don’t know:
- Why is this adverse reaction on the rise?
- Does Ondansetron prevent nausea in people who have previously not experienced nausea with anesthesia?
- Dr. Colozzi believes that it is not a good idea to give ondansetron to every patient in the operating room as has been a common practice in many hospitals.
- Dr. Colozzi emphasizes that ondansetron is a great drug and he commonly orders it for PONV with excellent results.
Questions & Discussion