NAUSEA AND VOMITTING

Nausea and vomiting with cancer therapy are important concerns for patients and medical personnel.

Poor control of nausea and vomiting can result in dehydration, electrolyte abnormalities and hospital admissions. Also, inadequate control of nausea and vomiting may cause anticipatory nausea with subsequent treatment cycles thus having a negative impact on treatment compliance and quality of life.

Nausea and vomiting are mediated through the autonomic nervous system. Cytotoxic drugs cause damage to gastro intestinal cells resulting in the release of serotonin which is a neuro- transmitter. Other neuro- transmitters associated with vomiting include dopamine, histamine and substance P.

The vomiting centre is located in the lateral reticular formation of the fourth ventricle and is stimulated by signals from 4 sources;

1. The chemoreceptor trigger zone (CTZ) - sensitive to chemical abnormalities in the body.
2. Visceral afferents from the GI tract via the Vagus or Sympathetic nerves.
3. Afferents from the cerebral cortex and Limbic system (smell and taste)
4. Afferents from the vestibular- labyrinth apparatus.

When activated, the vomiting centre induces vomiting by stimulating salivary and respiratory centres, the pharyngeal, GI and abdominal musculature.

To be effective, anti-emetic agents should block the activation of the vomiting centre.

To successfully manage vomiting and nausea, all possible causes should be considered.

Nausea and vomiting may also be predicted from the chemo agents that will be used. Thus specific anti emetics will be included in each chemo protocol.

Chemotherapy agents may be graded according to emetogenic potential. This may also vary according to dose and combination with other agents. Knowledge of emetogenic potential is a useful guide for antiemetic's choice and combination.

Table 1. Emetogenic risk of chemotherapeutic Agents.

Level	Frequency of N/V	Agents
5	>90%	Cisplatin>50mg/m2, Cyclophosphamide > 1500mg/m2, dactinomycin
4	60-90%	Carboplatin, Cisplatin <50mg/m2, cyclophosphamide 750-1500mg/m2,cytarabine> 1000mg/m2,doxorubicin > v60mg/m2, methotrexate >1000mg/m2, procarbazine
3	30-60%	Cyclophosphamide <750mg/m2, doxorubicin <60mg/m2, methotrexate 250-1000mg/m2
2	10-30%	Cytarabine, etoposide, methotrexate 50-250mg/m2
1	<10%	Busulphan,hydroxyurea, methotrexate <50mg/m2, mercaptopurine,vincristine, vinblastine

*Source: Cancer in Children and Adolescents.

Low risk: <10-30%

Moderate Risk: 30-60%

High Risk: > 60%

General Guidelines

1. Low Emetogenic Chemotherapy
    - Metoclopramide will be used as the anti-nausea agent unless specified otherwise in a chemotherapy protocol.
2. Moderate to High Emetogenic Chemotherapy
    - Use Metoclopramide and Corticosteroid.

3. Anticipatory Vomiting
    - Use Benzodiapines

Anti- emetics

1**. Metoclopramide**

- Blocks the CTZ by blocking dopamine, also accelerates gastric emptying.
- In high doses blocks serotonin receptors.
- may cause extrapyramidal reactions.
- 1-2mg/kg IV or oral 15-30 minutes before chemotherapy, then 6 hourly for 24 hours during treatment.

2. Phenothiazine-

- Act by depressing the chemo receptor trigger zone and vomiting centre by blocking dopamine.
- May causes extrapyramidal reactions.
- administer Diphenhydramine concurrently and for 24 hours post treatment to prevent extrapyramidal reactions.

a. Promethazine 0.25-0.5mg/kg/dose 6-8 hourly.

b. Chlorpromazine > 6 months 0.5mg/kg IM/IV 6-8 hourly
< 5 years 40mg/day
5-12 years 75 mg/day

3. **Corticosteroids**

- Only to be used if patient is not on steroids as part of chemotherapy.

- Dexamethasone

  - < 3 years 2mg IV
  - years 4mg IV
  - 5-10 years 6 mg IV
  - 10 years 8 mg IV

Given 30 minutes prior to chemotherapy.

4. Antihistamines

- Block the labyrinth impulses to the CTZ thus decreasing the toxicity of metoclopramide, thus treating extrapyramidal effects.
- Children 5mg/kg/day orally.
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Other

- Avoid greasy foods, spicy foods and food with strong odours
- Eat small amounts and avoid over eating
- Avoid food 1-2 hours prior to chemotherapy.

References

1. Albin A 1997, Supportive Care of Children with Cancer 2nd Edition, John Hopkins University Press Baltimore 1997.
2. Carrol W 2010, Cancer in Children and Adolescents, Jones and Bartlett Publishers, India, 2010.
3. Oussama A 2010, Handbook of Supportive Care in Paediatric Oncology, Jones and Bartlett Publishers, Massachusetts 2010.