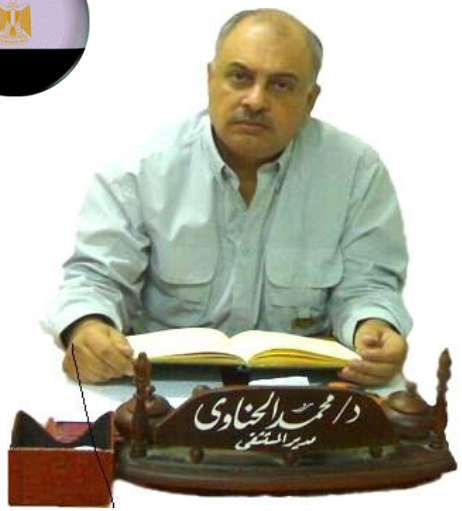


Pernicious Vomiting Of Pregnancy

Hyperemesis Gravidarum

(HG)

Dr Muhammad El Hennawy

Ob/gyn specialist

Rass el barr –dumyat - egypt

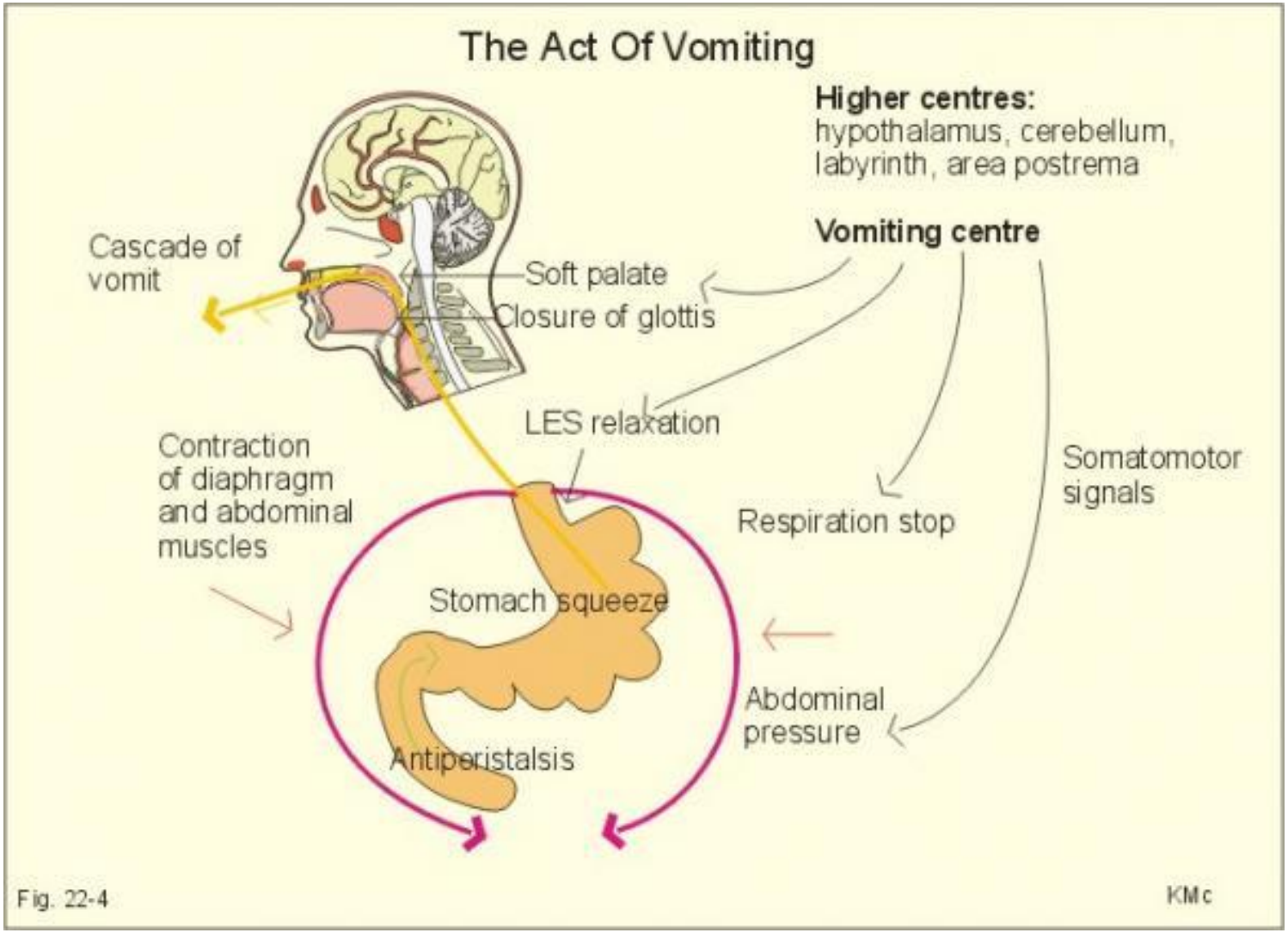
www.mmhennawy.8m.com

Names

- **Pernicious vomiting of pregnancy.**
- **severe nausea and vomiting of pregnancy.**
- **Severe Morning Sickness.**
- **Persistent Vomiting of Pregnancy.**
- **HG (hyperemesis gravidarum) .**
- **Uncontrollable vomiting during pregnancy .**

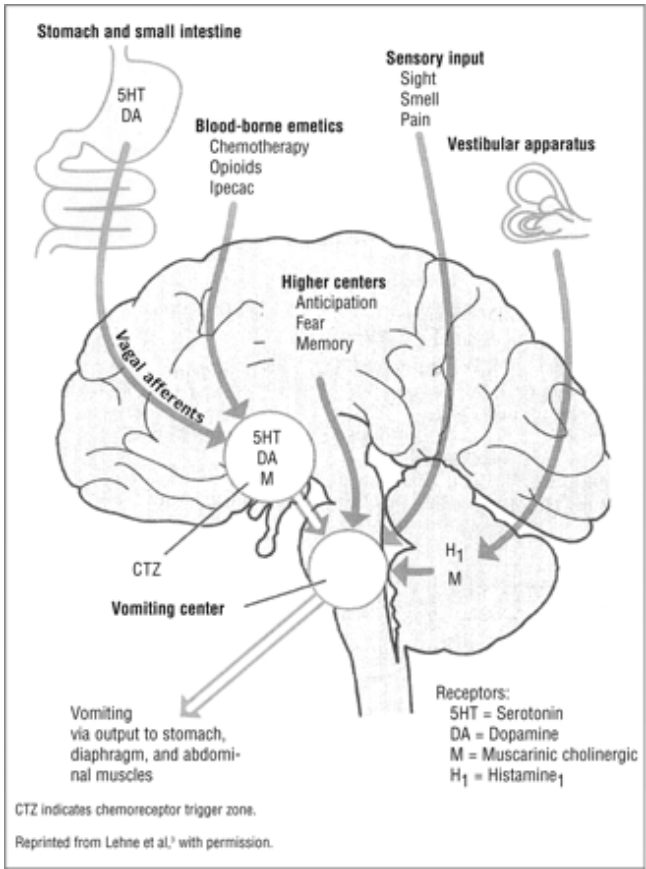
- Nausea is the unpleasant, painless sensation that one may potentially vomit.
- Vomiting is an organized, autonomic response that ultimately results in the forceful expulsion of gastric contents through the mouth.

Act Of Vomiting



Protective Mechanism

- Normal nausea and vomiting may be an evolutionary protective mechanism
- It may protect the pregnant woman and her embryo from harmful substances in food, such as pathogenic microorganisms in meat products and toxins in plants, with the effect being maximal during embryogenesis (the most vulnerable period of pregnancy).
- This is supported by studies showing that women who had nausea and vomiting were less likely to have miscarriages and stillbirth



Incidence

- **50 - 90 percent of pregnant women report having some nausea in their first trimester,**
- **More than 40 percent report vomiting.**
- **Vomiting usually begins around the fifth to sixth week of pregnancy and peaking at 9 weeks, and usually resolves on its own by week 16 – 18 .**
- **However, symptoms may continue until the third trimester in 15 to 20 percent of gravida and until delivery in 5 percent.**
- **If vomiting persists beyond a few days postpartum , other etiologies should be investigated.**
- **Severe, persistent vomiting is called hyperemesis gravidarum. approximately 3.5 per 1000 pregnancies .**
- **Hyper means 'over', Emesis means 'vomiting' and Gravidarum means 'pregnancy'**

Epidemiology

It is more common in:

- **Primigravida**
- **Multiple pregnancy**
- **History of previous hyperemesis**
- **Mother or sister with HG**
- **The presence of trophoblastic disease**
- **Previous intolerance to oral contraceptives**
- **Young maternal age under the age of 20**
- **low to middle socioeconomic class**
- **Lower levels of education**
- **Carrying a female fetus.**
- **No previous completed pregnancies**
- **Obesity**
- **History of infertility**
- **Corpus luteum in right ovary,**
- **Nonsmokers.**
- **Women prone to travel sickness**
- **Medical complications of hyperthyroid disorders, psychiatric illness, gastrointestinal disorders, pregestational diabetes, and asthma**

It is less common with

- **Maternal age older than 30 years**
- **Maternal smoking**
- **Unmarried mothers.**

Degree Of Nausea and Vomiting During Pregnancy

- IN EARLY PREGNANCY

  - Related to pregnancy

- Mild --- in evening or morning ---- mild emesis gravidarum
- Moderate – with meals ---- moderate emesis gravidarum
- Severe --- frequent more than 10 times

  - without affection of general condition of pregnant---severe emesis gravidarum

  - with affection of general condition of pregnant ----- HYPEREMESIS GRAVIDARUM

    = hyperemsis gravidarum without complications

    = hyperemsis gravidarum with complications

  - Other causes of nausea and vomiting

- IN LATE PREGNANCY

  -HYPEREMESIS GRAVIDARUM

  - Other causes of nausea and vomiting

= hyperemsis gravidarum without complications

- with affection of general condition of pregnant (increase pulse over 100 + Decrease systolic blood presure below 100 + increase temp above 38 degree + dehydration like dry tongue , sunken eyes + ketosis
- = hyperemsis gravidarum with complications
  - **Esophageal rupture or perforation**
  - **Pneumothorax and pneumomediastinum**
  - **Wernicke encephalopathy or blindness**
  - **Hepatic disease**
  - **Seizures, coma, or death**

. Others complications include renal failure, pancreatitis, deep venous thrombosis, pulmonary embolism, central pontine myelinolysis, rhabdomyolysis, vitamin K deficiency and coagulopathy, and splenic avulsion.

Severity

- Assessment of severity by checking for ketones is important as severity determines management

Emesis Gravidarum	Hyperemesis Gravidarum
common	rare
Confined to meals	Repeated throughout day severe and persistent
Not affect general condition	affect general condition weight loss, dehydration, nutritional deficiencies, electrolyte imbalance, pH imbalance (metabolic acidosis), and possible liver damage
suppress about 12 week Even without treatment	Progressive course even fatal unless effective treatment often persists for the duration of the pregnancy
A rarely need hospitalisation	Always need hospitalisation
Need Oral fluid	Need Enteral or Parenteral fluid

The Causes

High–fat diet

Psychological

genetic

Ovarian hormones
(oestrogens, progesterones)

Helicobacter pylori

Reduced
motility and
secretion

Liver
dysfunction

Serotonin

High levels of hCG

allergy to corpus hormones

Decreased vitamin b6 and b1 vitamin

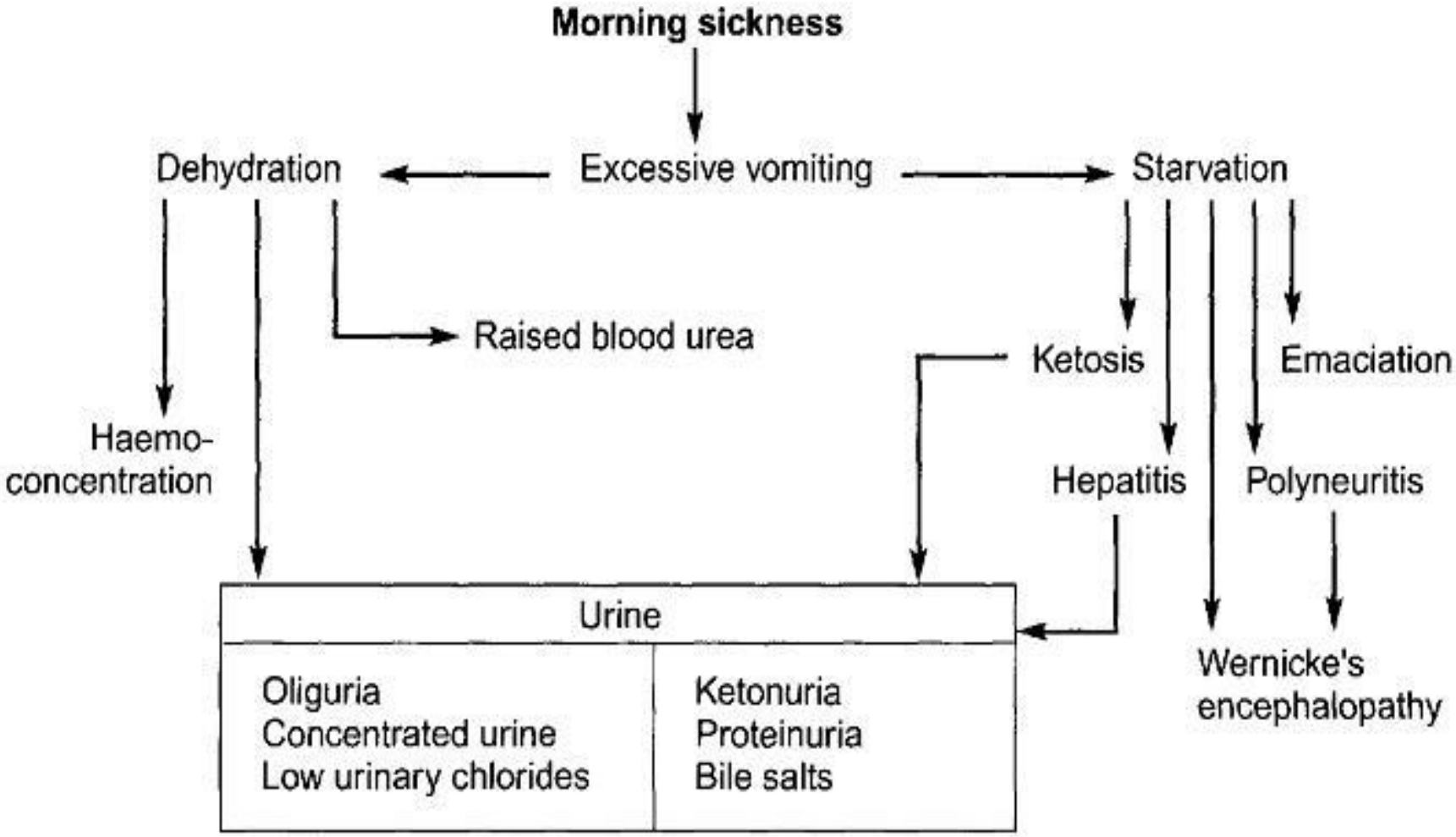
Decreased adrenocorticosteroid hormone

Hyperthyroidism

The Causes

- **The pathogenesis of NVP is poorly understood and the etiology is likely to be multifactorial**
- **Genetic component, as sisters and daughters of women with hyperemesis have a higher incidence .**
- **Hormonal: high human chorionic gonadotrophin (hCG) stimulates the chemoreceptor trigger zone in the brain stem including the vomiting center. This is the most accepted theory and proved by the higher frequency in the conditions where the hCG is high as in:-**
  - **early in pregnancy, - vesicular mole and - multiple pregnancy.**
- **Allergy: to the corpus luteum or the released hormones. As Increased estrogen levels affects the part of the brain that controls nausea and vomiting.**
- **Deficiency of: - adrenocortical hormone and /or, - vitamin B6 and B1**
- **Nervous and psychological: due to**
  - **psychological rejection of an unwanted pregnancy,**
  - **fear of pregnancy or labour so it is more common in primigravidae.**
- **Hyperthyroidism most probably because of the thyrotropic action of human chorionic gonadotrophin (HCG).**
- **High-fat diet. women with a high-fat diet are at a much greater risk for developing hyperemesis gravidarum. Their risk increases five times for every additional 15 grams of saturated fat (such as a quarter-pound cheeseburger) they eat each day.**
- **Helicobacter pylori. 90% of pregnant women with hyperemesis gravidarum are also infected with this bacterium, which may sometimes cause stomach ulcers**
- **Gastrointestinal changes. During entire pregnancy -Gastric dysrhythmias have been associated with morning sickness because the gastrointestinal tract more sensitive to the neural/humoral changes . acid reflux and the stomach emptying more slowly, which can cause nausea and vomiting .**
- **Liver dysfunction - Liver disease, usually consisting of mild serum transaminase elevation, occurs in almost 50% of patients with hyperemesis gravidarum as a cause or as a result**
- **Vestibular and olfaction : Hyperacuity of the olfactory system or subclinical vestibular disorders**
- **Overactivation of sympathetic nerves and enhanced production of tumor necrosis factor (TNF)-alpha.21 to induce secretion of hCG.**
- **Increased Serotonin - still awaiting larger studies to confirm its role in hyperemesis gravidarum.**

Effect Of Severe Vomiting



Pathological Changes

- **These are the same as in prolonged starvation:**
- **Liver: small fatty infiltration.**
- **Kidney: fatty degeneration of the convoluted tubules.**
- **Heart: small subendocardial and subpericardial haemorrhages.**
- **Brain: congestion and petechial haemorrhages in the brain stem resembling that of Wernicke's encephalopathy.**
- **Eye: optic neuritis and retinal haemorrhage.**
- **Peripheral nerves: degeneration.**
- **Blood:**
  - **Hypovolaemia and haemoconcentration.**
  - **Hyponatraemia, hypokalaemia and hypochloraemia.**
  - **Increased blood urea.**
  - **Hyperbilirubinaemia (due to liver damage).**
  - **Acidosis.**
- **Urine:**
  - **Oliguria.**
  - **Increased specific gravity.**
  - **Decreased chloride.**
  - **Albuminuria.**
  - **Ketonuria**.

Symptoms

Severe nausea

The patient cannot retain anything in her stomach, vomiting occurs through the day and night even without eating.

Thirst, constipation and infrequent urination

In severe cases, vomitus is bile and/ or blood stained.

Finally, there is manifestations of Werniche's encephalopathy as drowsiness, nystagmus and loss of vision then coma.

Signs

Manifestations of starvation and dehydration:

Loss of weight -- loss of 5 or more pounds over a 1-2 week period.

Sunken eyes.

Dry tongue dry mucous membranes, and inelastic skin.

Teeth covered with sordes.

Breath acetone smell

Late , Slight jaundice (yellow coloring to skin or whites of eyes).

Pulse: rapid and weak.

Blood pressure: low.

Temperature: slight rise

Laboratory Studies

- **Initial lab studies for hyperemesis gravidarum should include the following:**
- **Urinalysis for ketones and specific gravity: A sign of starvation, ketones may be harmful to fetal development. High specific gravity occurs with volume depletion.**
- **Serum electrolytes and ketones: Assess electrolyte status to evaluate for low potassium or sodium, identify hyperchloremic metabolic alkalosis or acidosis, and evaluate renal function and volume status.**
- **Liver enzymes and bilirubin: Elevated transaminase levels may occur in as many as 50% of patients with hyperemesis gravidarum. Mild transaminitis often resolves once the nausea has resolved. Significantly elevated liver enzymes, however, may be a sign of another underlying liver condition, such as hepatitis (viral, ischemic, autoimmune), or some other etiology of liver injury**
- **Amylase/lipase: Amylase level is elevated in approximately 10% of patients with hyperemesis gravidarum. Lipase, when combined with amylase, can increase the specificity in diagnosing pancreatitis as an etiology.**
- **TSH, free thyroxine: Hyperemesis gravidarum is often associated with a transient hyperthyroidism and suppressed TSH levels in 50-60% of cases. However, an elevated free thyroxine may suggest that overt hyperthyroidism is present, thus necessitating further workup and treatment.**
- **Urine culture: This may be indicated because urinary tract infection is common in pregnancy and can be associated with nausea and vomiting.**
- **Calcium level: Consider measuring Ca++ levels. Some rare cases have been reported of hypercalcemia being associated with hyperemesis gravidarum, resulting from hyperparathyroidism.**
- **Hematocrit: This may be elevated because of volume contraction.**
- **Hepatitis panel: If clinically indicated, hepatitis A, B, or C may be confused with hyperemesis gravidarum.**

Imaging Studies

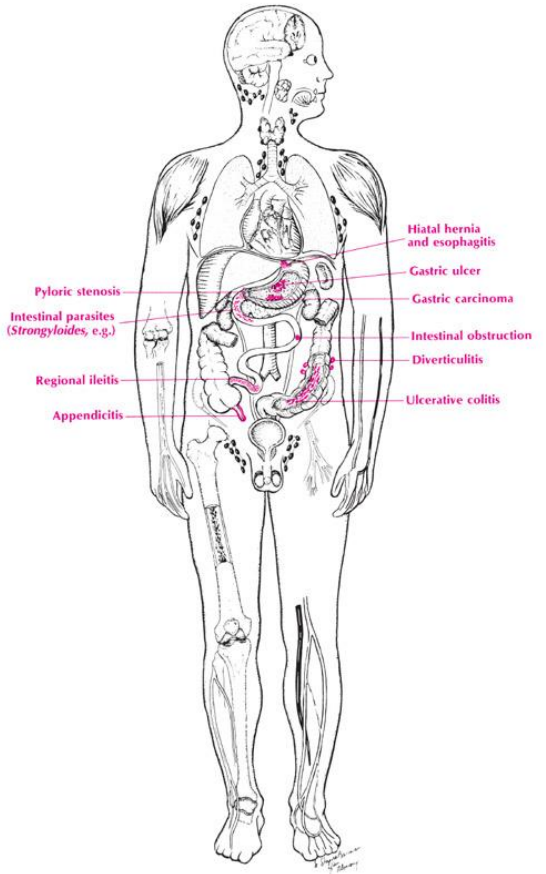
- Obstetric ultrasonography is usually warranted in patients with HEG to evaluate for multiple gestations or trophoblastic disease.
- Additional imaging studies generally are not needed unless the clinical presentation is atypical (eg, nausea and/or vomiting beginning after 9-10 wk of gestation, nausea and/or vomiting persisting after 20-22 wk, acute severe exacerbation) or another disorder is suggested based on history or physical examination findings.
- If indicated clinically, performing upper abdominal ultrasonography to evaluate the pancreas and/or biliary tree appears to be a low-risk study.
- In rare cases, abdominal CT scan or even MRI may be indicated if appendicitis is under consideration as a cause of nausea and vomiting in pregnancy.

Procedures

- In patients with abdominal pain or upper gastrointestinal bleeding, upper gastrointestinal endoscopy appears to be safe in pregnancy,
- Although careful monitoring is suggested.

DD =rule out other possible causes

- Vomiting due to pregnany : ectopic pregnancy, vesicular mole , acute hydramnios, acute fatty liver , severe pre-eclampsia , complicated ovarian tumours
- Vomiting during pregnancy : cholecystitis, appendicitis, pyelonephritis, Esophagitis ,gastroenteritis, Irritable Bowel Syndrome , gall bladder diseases, , Hepatitis , Hyperthyroidism , Pancreatitis , Peptic ulcer disease , Thyrotoxicosis caused by Grave's disease), ,nephrolithiasis, diabetic ketoacidosis or gastroparesis, Vestibular lesions , benign intracranial hypertension, and migraine headaches.



Prophylaxis

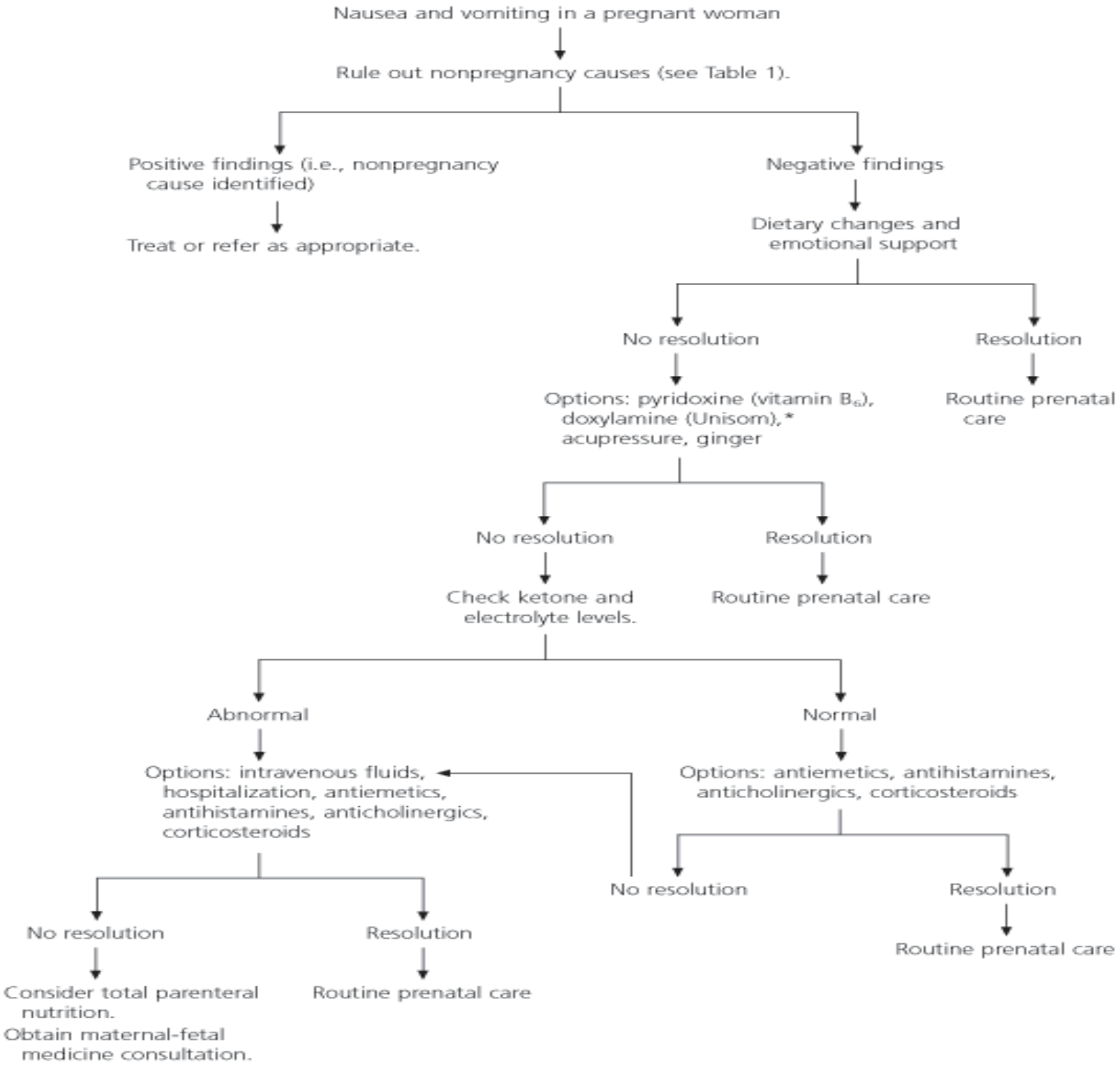
- Although there are no known ways to completely prevent hyperemesis gravidarum,
- The following measures might help keep morning sickness from becoming severe:
- Eating small, frequent meals
- Eating bland foods
- Waiting until nausea has improved before taking iron supplements
- Using a pressure-point wrist band, vitamin B6, and/or ginger,

Aim Of Treatment

- Hospitalisation for observation, fluid therapy and competition of neurosis
- TTT dehydration (Oral Or Intravenous Hydration) .
- TTT starvation (Oral feeding Or Enteral nasogastric or gastric feeding Or Parenteral nutrition)
- TTT electrolyte disturbance
- TTT nausea and vomiting (Vitamin B6 , antihistaminic , Anti-emetic , Prokinetic , corticosteroid)
- Prevent and TTT complications

TTT

- Treatment for Hyperemesis gravidarum is not cheap.


Nausea and vomiting in a pregnant woman
Rule out nonpregnancy causes (see Table 1).
Positive findings (i.e., nonpregnancy cause identified)
Treat or refer as appropriate.
Negative findings
Dietary changes and emotional support
No resolution
Resolution
Routine prenatal care
Options: pyridoxine (vitamin B6), doxylamine (Unisom),* acupressure, ginger
No resolution
Resolution
Routine prenatal care
Check ketone and electrolyte levels.
Abnormal
Normal
Options: intravenous fluids, hospitalization, antiemetics, antihistamines, anticholinergics, corticosteroids
Options: antiemetics, antihistamines, anticholinergics, corticosteroids
No resolution
Resolution
Routine prenatal care
No resolution
Resolution
Routine prenatal care
Consider total parenteral nutrition.
Obtain maternal-fetal medicine consultation.

Patient Education

- Early patient education about the signs and symptoms of pregnancy may be beneficial.
- It is found an association between nausea and vomiting and insufficient knowledge about pregnancy, stress, doubts regarding the pregnancy, and poor communication with the doctor and spouse.

Activity

- Some patients note improvement of nausea and vomiting with decreased activity and increased rest.
- Other patients suggest that fresh outdoor air may improve symptoms.

Advice

- Avoid :Stuffy rooms Odors (eg, perfume, chemicals, coffee, food, smoke) , Heat and humidity , Noise , Visual or physical motion (eg, flickering lights, driving) , Being tired
- When eating
- • Tea and dry biscuit before getting up
- • Eat small frequent meals. Eat something every 2–3 hours to avoid hunger
- • Drink fewer liquids with meals. Drinking liquids can cause a full, bloated feeling. Drink liquids 1/2 to 1 hour - at least 2 litres of fluids daily
- • Drink cold, clear, and carbonated or sour fluids (eg, ginger ale, lemonade)
- • When feeling nauseated, slowly sip on carbonated
- • Not mixing solids and liquids can increase nausea
- After meals
- • Brushing teeth after eating may help prevent symptoms. Avoid lying down immediately after eating
- • Rest after meals. Sit up in a chair for about an hour after meals
- • Avoid sudden movements. Rise slowly from the bed
- • Avoid these foods: – Fatty, greasy, or fried – Spicy or hot — With strong odors, like cooked broccoli, cabbage, fish, etc.
- Avoid fast-release sugar like very sweet, such as candy, cake or cookies is quickly metabolised and hypoglycaemia follows, leading to a vicious circle of eating – nausea – eating, and the risk of excessive weight gain. Slow-release carbohydrates are better, including bananas, porridge, jacket potatoes, wheatgrain toast, rice crackers etc.
- • Choose bland foods. Try toast, crackers, pretzels, rice, oatmeal, skinned chicken (baked or broiled, not fried), and fruits and vegetables that are soft or bland, like canned peaches
- • Eat easily digested starches, like rice, potatoes, noodles, cereal and bread
- • Pick low fat protein foods. Eat lean beef and pork, skinless chicken or turkey, eggs, and boiled beans
- • Try eating salty, sweet food combinations, like potato chips or pretzels and Lemonade or sour patch kids, before meals
- • Prepare foods that do not require cooking, like sandwiches
- • Smelling fresh lemon, mint, or orange or using an oil diffuser with these scents may also be useful
- Wear loose clothes

Emotional Support

- **Although nausea and vomiting of pregnancy and hyperemesis gravidarum are not strongly associated with psychologic illness, some women may become depressed or exhibit other affective changes.**
- **It is important that these women receive appropriate support from family members and medical and nursing staff.**
- **Consultation is indicated if a pregnant woman is depressed, domestic violence is suspected, or evidence of substance abuse or psychiatric illness exists.**
- **Diazepam (Valium) has been used in one randomized study and appeared to shorten hospitalization, significantly reduce nausea, and decrease readmission for HEG. No significant adverse effects or fetal abnormalities were observed. But Dose not established for HG.**

Peppermint Essential Oil

- The aroma of peppermint can help a queasy stomach.
- Fill a large bowl with hot water. Place two drops of peppermint essential oil in the bowl and place it on a table near the bed.

GINGER

Ginger (*Zingiber officinale*) is present as a spice in foods and beverages.

It can also be taken in the form of tea or tablet extracts

There is only one RCT examining the efficacy, but not

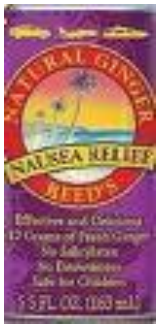
the safety, of 1000 mg/day of ginger.

Adult 250 mg PO qid (powdered ginger root).

Ginger is a nonregulated food product and most preparations available are of uncertain purity and composition.

No evidence-based studies have been published to exclude the possibility of teratogenicity, and at the present time, large quantities of ginger should not be recommended as a treatment for NVP.

Ginger Candy



How To Make
Ginger Tea for Nausea

Ingredients

- **1 teaspoon fresh grated ginger**
- **2 teaspoons tea powder**
- **1 teaspoon sugar or honey**
- **1/2 teaspoon lemon juice (optional)**
- **4 cups water**

Procedure

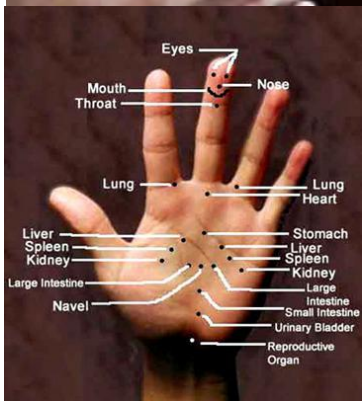
- **Add 1 teaspoon fresh grated ginger to 4 cups boiling water and simmer for about 5 minutes.**
- **Now add 2 teaspoons of tea powder.**
- **Strain the tea after a few minutes and**
- **Mix 1 teaspoon sugar or honey to the strained tea.**
- **Add 1/2 teaspoon lemon juice (optional) and serve hot.**
- **Add some cloves, cardamom or lemon grass if pregnant wish to make the tea stronger.**
- **For a sour taste, pregnant could add some orange peel strips.**
- **Ginger tea recipe is a remedy for nausea.**

Vestibular stimulation

- NVP is triggered, and can be exacerbated by abnormal effects on the vestibular (balancing) mechanism in the ear
- NVP is often worse for women prone to travel sickness, and normalisation of the balancing mechanism can be a simple means of reducing the severity of symptoms.
- A contemporary commercial DVD (Morningwell) is now available uses inaudible pulsed frequencies overlaid with music, and must be used with personal headphones so that the pulsations rebound on the vestibular apparatus in the ears.
- 90% successful in suppressing NVP.

Acupressure

- Acupressure is the stimulation by pressure on specific sites called acupoints.
- Relief in 10-30 seconds. Sometimes, however, it can take up to five minutes.
- The most common acupoint in the treatment of nausea and vomiting is the pericardium 6 (P6), located three fingers' width above the wrist on the inner arm surface
- Or tap both wrists together gently at the acupressure points while taking deep breaths
- Also St36 , On the front of the leg, one hand width (four fingers) below the knee cap, on the outside, in the depression between the shin bone and the leg muscle.
- Also point in palm 2 finger breadth below the base of second and thied finger
- The advantage of acupressure in treating NVP is that there is no exogenous source of risk to the fetus..
- In addition, a transcutaneous electronic acoustic stimulator of P6 is available,
-



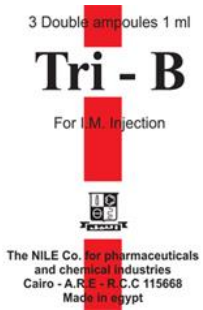
P6 Wrist Bands

- They are inexpensive, can be positioned over acupressure points on both wrists .
- On the other hand, traditional acupuncture should be performed only under the supervision of a trained professional.

Vitamins

- Essential for normal DNA synthesis and play a role in various metabolic processes.
- Vitamin B6 (Pyridoxine) which helps ease nausea (if pregnant can not take it orally pregnant can give it as an injection) 10-50 mg PO bid/qid (often 30-100 mg/d)
- **Tri-B *Tablet - Ampoule***

  Each Ampoule 1 contains:- Vitamin B1--------100 mg. - Vitamin B6 ------- 40 mg.
  - Ampoule 2 contains:- Vitamin B12------ 1000 mcg.
- **Each tablet contains: - Vitamin B1 ------ 125 mg. - Vitamin B6 ------ 125 mg.**
  - Vitamin B12 ---- 125 mcg. - Folic acid -------- 5 mg.
- **Dosage and Administration:-**
  - Injection: The contents of the ampoules 1 and 2 are mixed and injected intramuscularly daily.
  - Tablets: 1- 2 tablets daily.



Antihistamines

- Antihistamines (H1 histamine receptor antagonists) are effective in nausea and vomiting during pregnancy and in small numbers of patients with HEG, providing relief in 82% of patients.
- It decreases excitability of middle ear labyrinth and
- Blocks conduction in middle ear vestibular-cerebellar pathways.
- Competes with histamine for H1-receptor sites on effector cells in the gastrointestinal tract, blood vessels, and respiratory tract;
- Anticholinergic and
- Sedative effects are also seen

eg : Cyclizine , Diphenhydramine (Benadryl) Dimenhydrinate (Gravol, Dramamine), Meclozine (Bonine, Antivert).

Antiemetics

ANTIDOPAMINERGICS: PHENOTHIAZINES :

- Compazine, Stemetil (Prochlorperazine).
- Phenergan (Promethazine).
- Thorazine (Chlorpromazine).

SEROTONIN ANTAGONISTS :

- Ondansetron: (Zofran) .

- **Prochlorperazine (Compazine)**
- May relieve nausea and vomiting by blocking postsynaptic mesolimbic dopamine receptors through anticholinergic effects and depressing reticular activating system. In a placebo-controlled study, 69% of patients given prochlorperazine reported significant symptom relief, compared to 40% of patients in the placebo group.
- PO: 5-10 mg tid/qid; not to exceed 40 mg/d
  IV: 2.5-10 mg q3-4h prn; not to exceed 10 mg/dose or 40 mg/d
  IM: 5-10 mg q3-4h
  PR: 25 mg bid

- **Promethazine (Phenergan)**
- For symptomatic treatment of nausea in vestibular dysfunction. Antidopaminergic agent effective in treating emesis. Blocks postsynaptic mesolimbic dopaminergic receptors in brain and reduces stimuli to brainstem reticular system
- PO: 12.5-25 mg q4-6h prn (syr or tab)
  PR: 12.5-25 mg q4-6h prn
  IV/IM: 12.5-25 mg q4-6h; use caution with IV administration, concentration not to exceed 25 mg/mL, rate not to exceed 25 mg/min; do not administer SC or intra-arterially

- **Chlorpromazine (Thorazine, Ormazine)**
- Mechanisms responsible for relieving nausea and vomiting include blocking postsynaptic mesolimbic dopamine receptors, anticholinergic effects, and depression of RAS. Blocks alpha-adrenergic receptors and depresses release of hypophyseal and hypothalamic hormones.
- PO: 10-25 mg q4-6h prn
  PR: 50-100 mg q6-8h prn
  IM: 12.5-25 mg once; if no hypotension, may administer 25-50 mg q3-4 h prn; caution with parenteral administration because of the potential for hypotension

- **Ondansetron: (Zofran)**
- Selective 5-HT3-receptor antagonist, blocking serotonin, both peripherally on vagal nerve terminals and centrally in the chemoreceptor trigger zone
- 4-8 mg PO q12h
  Alternatively, 8 mg administered IV over 15 min q12h or 1 mg/h infused continuously for up to 24 h

Prokinetic drugs

- **Metoclopramide (Reglan)**
- Blocks dopamine receptors and (when given in higher doses)
- Also blocks serotonin receptors in chemoreceptor trigger zone of the CNS;
- Enhances the response to acetylcholine of tissue in upper GI tract causing enhanced motility and accelerated gastric emptying without stimulating gastric, biliary, or pancreatic secretions;
- Increases lower esophageal sphincter tone
- 10 mg PO 30 min ac and hs or qid
  Severe symptoms: 10 mg IV over 1-2 min prn or q4-8h
- The US Food and Drug Administration has issued a black-box warning concerning the use of Reglan in general. Because the risk for tardive dyskinesia increases with the duration of treatment and the total cumulative dose, treatment duration should not exceed 12 weeks

ANTICHOLINERGICS/ANTISPASMODICS

- Should not be used in treatment of hyperemesis gravidarum.
- These agents slow gastric emptying and prolong GI transit time.
- Since slowed gastric emptying is part of the etiology of HG, these agents are inappropriate.

Helicobacter Pylori Treatment

Helicobacter pylori is a Gram-negative, microaerophilic bacterium that can inhabit various areas of the stomach,

Good results have been reported following treatment with

an oral antibiotic

and proton pump inhibitor

and H2 antagonist.

Screening Tests Used To Detect H. pylori

* Blood antibody test. A blood test checks to see whether the body has made antibodies to H. pylori bacteria. If pregnant have antibodies to H. pylori in her blood, it means pregnant either are currently infected or have been infected in the past.
* Stool antigen test. A stool antigen test checks to see if substances that trigger the immune system to fight an H. pylori infection (H. pylori antigens) are present in the feces (stool). Stool antigen testing may be done to help support a diagnosis of H. pylori infection or to determine whether treatment for an H. pylori infection has been successful.
* Stomach biopsy. A small sample (biopsy) is taken from the lining of the stomach and small intestine during an endoscopy. Several different tests may be done on the biopsy sample.

Oral Antibiotic For H . Pylori

- PPI (Bantobraozl 20 mg twice daily)
  + Clarithromycin 500 mg twice daily
  + Amoxicillin 1000 mg twice daily
- or
- PPI + clarithromycin + metronidazole
- Dose taken with a glass of water before eating for a period of 14 days
- Clarithromycin should not be administered in pregnant women except in clinical circumstances where no alternative treatment option is appropriate
- Metronidazole also carry a black box warning because of its known ability to be carcinogenic in mice and rats
- Rapid marked response of severe hyperemesis gravidarum to oral erythromycin.

Corticosteroids

For treatment for women with refractory hyperemesis gravidarum in women who fulfil the criteria of severe disease. .

Corticosteroids should only be given after 10 weeks of gestation, and only to women who do not have symptom relief with other treatments.

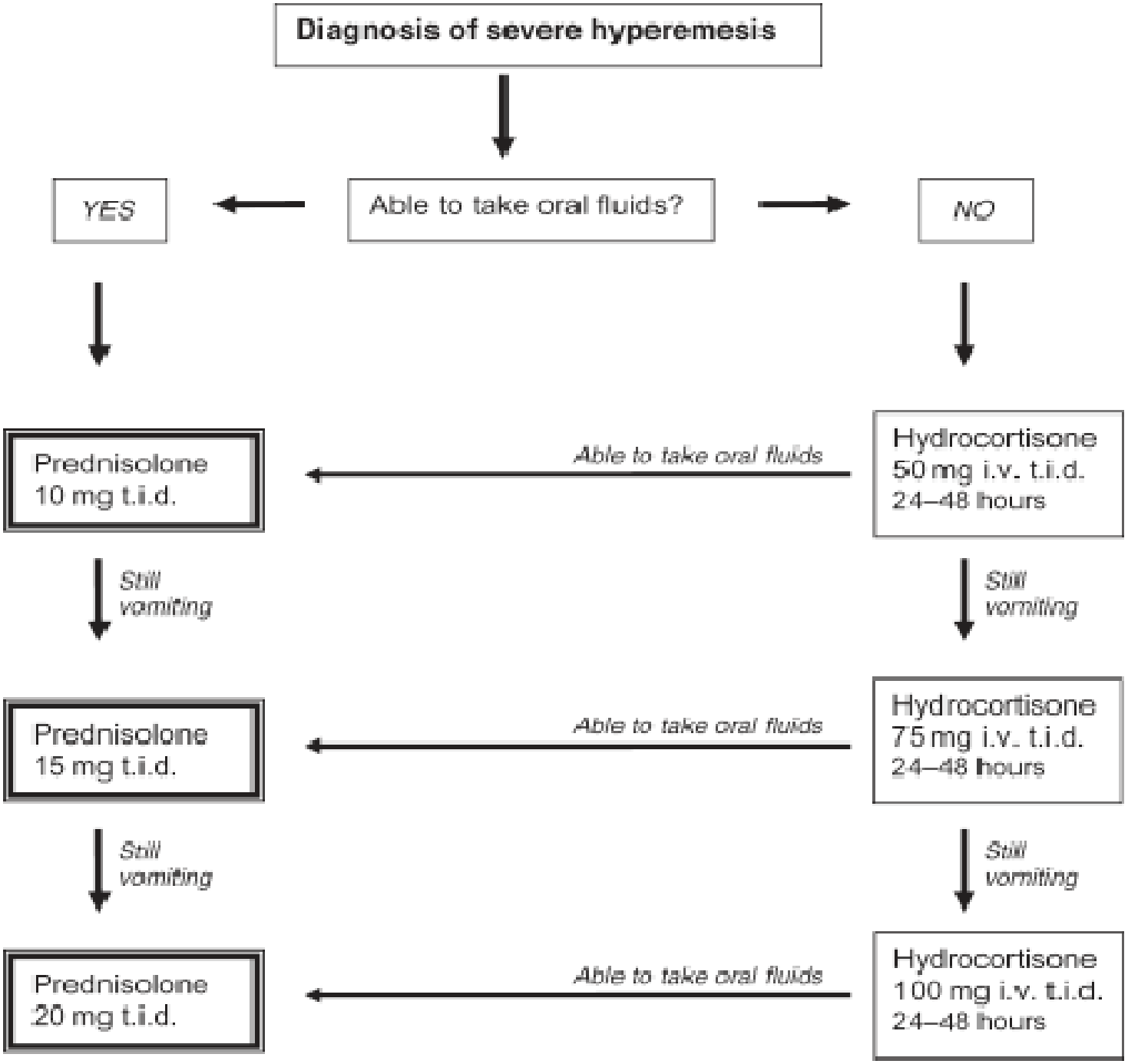
May improve symptoms of nausea and vomiting

The use of glucocorticoids before 10 weeks of gestation was associated with a 3- to 4- fold higher risk for cleft lip with or without cleft palate

- Intravenous methylprednisolone (Medrol, Solu-Medrol) 40 of every 8 hours or an oral methylprednisone 8-12- 16 mg 3 times per day or oral prednisolone 10-15-20 mg t.i.d for three days was followed by an oral prednisone taper for 7 days.
- Intravenous Hydrocortisone 150-300 mg as a daily dose (50-75-100 mg t.i.d) then after 3 days the hydrocortisone was tapered completely during the course of 1 wk

Short course of corticosteroids is an effective treatment for intractable hyperemesis gravidarumand can significantly reduce the need for hospitalization.

Adrenal suppression isn't a concern unless a patient has been on systemic steroids for longer than 1 month--and again, most patients can be managed successfully with 2 weeks or less of therapy, she continued


Diagnosis of severe hyperemesis
Able to take oral fluids?
YES
NO
Prednisolone 10 mg t.i.d.
Able to take oral fluids
Hydrocortisone 50 mg i.v. t.i.d. 24–48 hours
Still vomiting
Still vomiting
Prednisolone 15 mg t.i.d.
Able to take oral fluids
Hydrocortisone 75 mg i.v. t.i.d. 24–48 hours
Still vomiting
Still vomiting
Prednisolone 20 mg t.i.d.
Able to take oral fluids
Hydrocortisone 100 mg i.v. t.i.d. 24–48 hours

ACTH

- Hyperemesis gravidarum were treated with intramuscular ACTH (0.5 mg) or placebo for 4 days in a randomized double-blind trial.
- The two treatments were equally effective in relieving hyperemesis, although the function of the adrenal cortex was stimulated only during the ACTH therapy.
- The administration of ACTH thus appears useless for the treatment of severe vomiting in early pregnancy.

ANTIREFLUX THERAPIES

The following adjuvant therapies are used primarily to reduce esophageal acid reflux associated with NVP.

They have all been shown to bring symptomatic relief in the non-pregnant population and are presumed to be effective in pregnancy as well.

Antacids usually contain salts of magnesium, calcium, or aluminum.

A wide proportion of pregnant women already use this kind of medication. These are not considered human teratogens when used in recommended doses.

H2 receptor antagonists include cimetidine, ranitidine(400 mg twice daily), and famotidine.

Use of these medications has not been associated with an increased risk for major malformations following first trimester exposure.

Proton pump inhibitors such as omeprazole (20 mg twice daily) have been used in limited numbers during pregnancy.

A recent study did not show an increased risk of congenital malformations.

Anti-thyroid drugs

As hyperthyroidism has been noted in patients with hyperemesis gravidarum,

it is tempting to prescribe anti-thyroid medication in an

attempt to suppress symptoms.

However, the role of anti-thyroid drugs in management remains unclear.

A short course of anti-thyroid drugs may be beneficial and can be discontinued once the vomiting has settled.

Other researchers however, have reported no benefits with anti-thyroid drugs as the hyperthyroidism is transient and self limiting.

Until more evidence is available, anti-thyroid drugs should not be routinely prescribed.

Cannabis

- Cannabis has anti-nauseant and anti-emetic effects
- Dose not established for HG
- Medical Marijuana is currently legal in the following states (US): Alaska, California, Washington, Oregon, Hawaii, Colorado, Arizona, Maine.

Hospitalization

- Severe cases of hyperemesis gravidarum require hospitalization.
- Once at the hospital, pregnant receive intravenous fluids, glucose, electrolytes, and, occasionally, vitamins and other nutritional supplements

IV Fluid

- At first, patients are given nothing by mouth.
- Initial treatment is IV fluid resuscitation, beginning with 2 L of glucose 5% infused over 3 h to maintain a urine output > 100 mL/h.
- Give Ringer's lactate according to acetone level (250-500 ml) every 12 hour
- Give thiamin 100 mg should be given IV Or IM first with glucose5%, to prevent Wernicke's encephalopathy. This dose of thiamin should be given daily for 3 days.
- Subsequent fluid requirements vary with patient response but may be as much as 1 L q 4 h or so for up to 3 days.
- Electrolyte deficiencies are treated; K, Mg, and P are replaced as needed.
- Care must be taken not to correct low plasma Na levels too quickly because too rapid correction can cause osmotic demyelination syndrome.
- Intravenous fluid therapy may be given in the hospital or at home by a visiting nurse

Nutritional Support

- Women who do not respond to IV rehydration and medication may require nutritional support.
- Patients might receive
- Enteral nutrition (via a 6- to 8-French nasogastric tube or a percutaneous endoscopic gastrostomy (PEG).
- Parenteral nutrition (intravenous feeding via a PICC line)

Feeding tubes

- May be inserted through the nasal passage way for short-term use,
- But for those patients who require longer use of the tube, it is customary to place the tube directly into the stomach through the abdominal wall. This second method is called a percutaneous endoscopic gastrostomy (PEG)
- The lifespan of the feeding tube is about six months. When the tubing begins to wear, it may pull away from the stomach wall and cause leakage near the insertion point. The replacement process is relatively simple, and usually does not involve another endoscopic procedure. Typically, the tubing is merely pulled out through the stomach site and then replaced with a new catheter

ENTERAL NUTRITION REGIMEN

A polymeric formula with or without fiber may be used for the majority of HEG patients.

In the clinic setting, health care providers can administer 25 mL and increase to 60–120 mL of the formula over a few minutes through the tube every hour ,

Followed by a water flush.

This will allow the clinician to check tolerance of the formula and provide some gastric nutrition to lessen the potential for nausea and emesis during the ride home

Parenteral Hyperelimentation (TPN)

- Parenteral hyperalimentation (TPN) is the administration of an IV solution designed to provide complete nutritional support for a patient unable to maintain adequate nutritional intake.
- The solution is normally composed of dextrose (5%35%), amino acids (3.5%5%), vitamins, electrolytes, and trace elements. Lipids (IV fat emulsions) are often given with TPN to supply essential fatty acids and calories
- Maternal indications for TPN have been varied, with duration of therapy ranging from a few days to the entire pregnancy

Termination of pregnancy

Indications:

Persistent severe vomiting after one week of treatment.

Pulse is persistently above 100/min, temperature persistently above 38oC or the systolic blood pressure is persistently below 100 mmHg.

Jaundice or bile in urine.

Anuria, absence of chloride in urine, persistent albuminuria or high blood urea.

Retinal haemorrhage or Wernicke's encephalopathy .

Methods of termination:

Vaginal evacuation: if pregnancy is less than 12 weeks.

Abdominal hysterotomy: if pregnancy is more than 12 weeks. Use nitrous oxide + oxygen for anaesthesia but not agents that affect liver as halothane. Prostaglandins cannot be used as it will aggravate the vomiting

Recommendations

- 1.Dietary and lifestyle changes should be liberally encouraged, and women should be counselled to eat whatever appeals to them. (III-C

  Early recognition of the problem with adequate and prompt rehydration is essential. Withhold oral feeding until vomiting is under control

2. Alternative therapies, such as ginger supplementation, acupuncture, and acupressure, may be beneficial. (I-A)

3. A doxylamine/pyridoxine combination should be the standard of care, since it has the greatest evidence to support its efficacy and safety. (I-A)

4. H1 receptor antagonists (antihistamincs) should be considered in the management of acute or breakthrough episodes of NVP. (I-A)

5. Pyridoxine monotherapy supplementation may be considered as an adjuvant measure. (I-A)

6. Phenothiazines are safe and effective for severe NVP. (I-A) And Ondansetron (1-B).

7. Metoclopramide is safe to be used for management of NVP, although evidence for efficacy is more limited. (II-2D)

8. Corticosteroids should be avoided during the first trimester because of possible increased risk of oral clefting and should be restricted to refractory cases. (I-B)

. Prochlorperazine (category C) and Promethazine (category C)

9. When NVP is refractory to initial pharmacotherapy, investigation of other potential causes should be undertaken. (III-A)

Psychotherapy - might be necessary if there is clinical suspicion of a psychological problem

Pharmacologic Therapy for Nausea and Vomiting of Pregnancy

Medication	*Dosage**	*Pregnancy category*
Pyridoxine (Vitamin B_6)†	25 mg orally three times daily	A‡
Doxylamine (Unisom)†	25 mg orally once daily	§
Antiemetics		
Chlorpromazine (Thorazine)	10 to 25 mg orally two to four times daily	C
Prochlorperazine (Compazine)	5 to 10 mg orally three or four times daily	C
Promethazine (Phenergan)	12.5 to 25 mg orally every four to six hours	C
Trimethobenzamide (Tigan)	250 mg orally three or four times daily	C
Ondansetron (Zofran)	8 mg orally two or three times daily	B
Droperidol (Inapsine)	0.5 to 2 mg IV or IM every three or four hours	C
Antihistamines and anticholinergics		
Diphenhydramine (Benadryl)	25 to 50 mg orally every four to eight hours	B
Meclizine (Antivert)	25 mg orally every four to six hours	B
Dimenhydrinate (Dramamine)	50 to 100 mg orally every four to six hours	B
Motility drug		
Metoclopramide (Reglan)	5 to 10 mg orally three times daily	B
Corticosteroid		
Methylprednisolone (Medrol)	16 mg orally three times daily; then taper	C

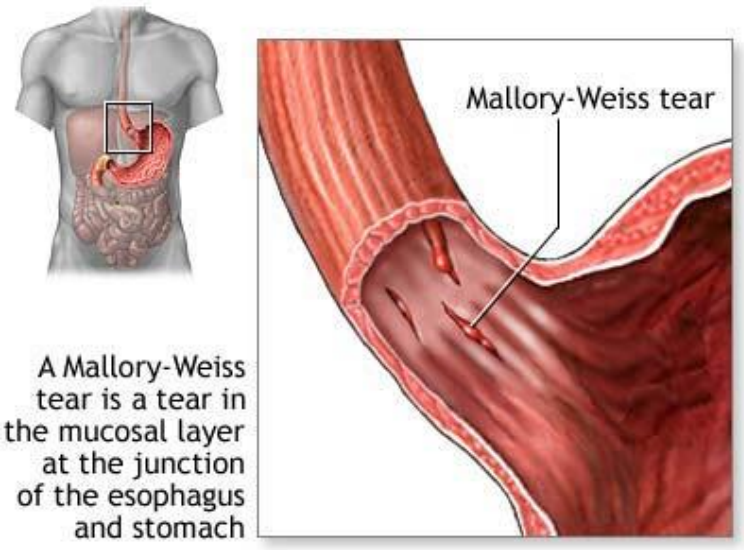
Maternal And Fetal Outcomes

- Women with uncomplicated nausea and vomiting of pregnancy (“morning sickness”) have been noted to have improved pregnancy outcomes, including fewer miscarriages, pre-term deliveries, and stillbirths, as well as fewer instances of fetal low birth weight, growth retardation, and mortality.
- In contrast, hyperemesis gravidarum has been associated with increases in maternal adverse effects, including dehydration , malnutrition , hypoglycaemia, splenic avulsion, esophageal rupture, Mallory-Weiss tears of oesophagus ,wernicke’s encephalopathy, pneumothorax, peripheral neuropathy, thromboembolic disorders (deep venous thrombosis, pulmonary embolism), central pontine myelinolysis, rhabdomyolysis, vitamin K deficiency and coagulopathy, acute renal failure and preeclampsia, as well as increases in fetal growth restriction and mortality

  Recent research in fetal programming indicates that prolonged stress, dehydration and malnutrition during pregnancy can put the fetus at risk for chronic disease, such as diabetes or heart disease ,later in life, or neurobehaviorial issues from birth
- Complications associated with central hyperalimentation include sepsis, fungemia, tamponade, local infection, venous thrombosis, fatty infiltration of the placenta, and transaminitis.

Mallory-Weiss Oesophegeal Tears

- They are extremely rare, but do happen.
- Tears to the cardiac part of the stomach from excessive vomiting



Wernicke's Encephalopathy

- A syndrome related to thiamin deficiency that may cause disorientation, confusion, and coma
- Have been reported in some rare cases
- Treatment begins with intravenous or intramuscular injection of thiamine, followed by assessment of central nervous system and metabolic conditions.
- In the presence of sub-clinical thiamine deficiency, a large dose of sugar (especially glucose) can precipitate the onset of overt encephalopathy
- Therefore, correcting hypoglycemia should not be attempted before thiamine replenishment.
- Rehydration to restore blood volume should follow, as needed

The physical And Emotional Impact Of NVP

It often results in feelings of anxiety and worry about the effect of the symptoms on the fetus.

It has a negative impact on family relationships and has major consequences on women's working abilities;

47% of working women with NVP feel job efficiency is reduced,

35% lose work time (mean loss of 62 working hours per woman), and

25% lose time from housework (mean loss of 32 hours per woman).

NVP is also cited as a reason for elective termination of pregnancy.

Follow-up

- Further Inpatient Care

  Inpatient care of hyperemesis gravidarum may be necessary if outpatient treatment fails or if severe fluid and/or electrolyte imbalance and nutritional compromise exist
- Further Outpatient Care

  Monitor patients regularly, paying attention to symptoms and to the state of mind of the patient and family. Monitor weight and urinary ketones at each visit.

Prognosis

- Hyperemesis gravidarum is self-limited
- In most cases, improves by the end of the first trimester.
- However, symptoms may persist through 20-22 weeks of gestation and,
- In some cases, until delivery.

Recurrence Of Hyperemesis

- Hyperemesis gravidarum is more strongly influenced by the maternal genotype than the fetal genotype, though environmental influences along the maternal line cannot be excluded as contributing factors
- Daughters who were born after a pregnancy complicated by hyperemesis had a 3% risk of having hyperemesis in their own pregnancy, while women who were born after an unaffected pregnancy had a risk of 1.1%
- Female partners of sons who were born after pregnancies complicated by hyperemesis had a risk of 1.2% .
- Daughters born after a pregnancy not complicated by hyperemesis had an increased risk of the condition if the mother had hyperemesis in a previous or subsequent pregnancy if hyperemesis had occurred in one of the mother's previous pregnancies and if it had occurred in a later pregnancy).

العلاج

- راحة تامة بالسرير مع عدم التفكير الدائم بالحمل بتسلية ما
- تسمع موسيقى بواسطة سماعات الأذن (موسيقى هادئة مع خلفية موسيقى للطبيعة)
- الضغط على باطن الرسغ على مسافة عرض 3 أصابع من نهاية كف اليد لمدة3 دقائق فى كلتا اليدين كل ساعة
- لاشى بالفم لمدة يومين + 2أ مبول جلوكوز مركز كل 6 ساعات (100 سم جلوكوز مركز 25 %)
- المحاليل = 2000 سم جلكوز 5% الآن على مدى ساعتين
  ثم 500 سم جلكوز 5% كل 6-8 ساعات + 500 سم ملح كل 6-8 ساعات + 250- 500 سم رينجر لاكتات كل 12 ساعة بحيث يكون كمية البول 100 سم فى الساعة
- ملاحظة عدد مرات القىء و كميته و وجود دم به
- تحليل بول للأسيتون كل 12 ساعة وحساب كمية البول كل 24 ساعة
- تحليل بول كامل + تحليل وظائف كلى + تحليل وظائف كبد
- عمل أشعة تليفزيونية على الرحم والجنين (حمل عنقودى أ و توائم)
- عمل جدول للسوائل الداخلة و الخارجة
- امبول كالسيوم جلوكونات وريد ببطء يوميا
- فيتامينات = امبول فيتامين ب (6+1) كل يوم (أمبول تراى بى عضل يوميا) + امبول فيتامين ج كل يومين + امبول فيتامين كاف كل 3 أيام
- إعطاء أمبول مضادالهيستامين1 يوميا (أمبول أفيل)
- إعطاء ACTH أمبول (كورتجن ب6 أمبول) كل 12 ساعة
- إعطاء أدوية منظمة لحركة الجهاز الهضمي = أمبول بلازيل كل 12 ساعة
- إعطاء مضادات القىء 2 دواء من الآتى = أمبول نيورازين 25 مجم كل 8 ساعات أو أمبول زوفران كل 12 ساعة أو إيميرال لبوس شرجى كل 12 ساعة أو موتيليوم لبوس شرجى كل 12 ساعة
- إعطاء مضادات الحموضة = مثل إبيكو جيل 15سم كل 4 ساعات أو مضادات الهيستامين2 مثل زنتاك 400 محم مرتين يوميا أو مضادات مضخة البروتون مثل أوميبرال 20 مجم مرتين يوميا بالفم
- إعطاء مضادات حيوية ضد ميكروب الهيلكوباكتر بيلوراى مثل الأموكسيسيلين 1000 مجم كل 12 ساعة بالفم
- إعطاء مهدى مثل أمبول فاليوم مع العرض على طبيب أمراض نفسية
- فى الحالات الشديدة إعطاء كورتيزون = هيدروكورتيزون 50 - 100 مجم وريد كل 8 ساعات لمدة 3 أيام ثم يخفض تدريجى على مدى أسبوع
- إذا نجح العلاج --- تخرج من المستشفى ولكن إعرف أنها ستعود
- إذا فشل العلاج بعد أسبوع إعطى تغذية بالرايل أو تغذية وريدية
- فإذا نجح العلاج --- تخرج من المستشفى ولكن إعرف أنها ستعود
- إذا فشل العلاج مرة أخرى بعد أسبوع أو ظهرت مضاعفات خطيرة -- تجرى عملية إجهاض للجنين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