

Hyperemesis Gravidarum (Inpatient)

Patient diagnosed with hyperemesis gravidarum¹:
 -persistent vomiting despite attempted outpatient treatment
 -weight loss > 5% of prepregnancy weight
 -documented ketonuria/dehydration
 -electrolyte imbalance

Admit to hospital:
 -make NPO
 -start IVF replacement, tailor IVF choice to patients electrolyte and acid/base balance
 -if not already done: U/S for molar pregnancy, neck exam for goiter and clinical assessment of hyperthyroid symptoms (check TFTs only if + signs/sx of hyperthyroidism)²

Has vomiting been prolonged > 3 weeks?

Yes
 Check electrolytes and start thiamine 100mg IV qd x2-3 days along with electrolyte replacement³

No
 Check electrolytes and replace as needed

Start alternating doses of Compazine 10mg IV and Reglan 10mg IV q 3hrs⁴.

*Consider acupuncture¹¹ as adjunctive treatment with all IV medications. Call Remy Coeytaux, FP faculty (216-9718), to arrange in-patient consult

Emesis continues after 24 hours of therapy

Emesis stops

Consider Zofran as second line agent: 4mg IV over 15 min q 8hrs⁵

-Start clear liquid diet for 24 hours
 -Advance to low fat, bland, dry diet as tolerated
 -Stop IV medication when diet is tolerated without nausea or vomiting
 -Start patient on PO antiemetics in preparation for outpatient treatment:
 -Consider Compazine 10mg with Atarax 50mg 30 minutes qac and qhs
 -Consider discontinuing outpatient regimen after 1 week from discharge

Emesis continues after 24 hours of therapy

Emesis stops

Increase to 8mg IV q 8hrs⁵

emesis continues for 24 hrs

Add Solumedrol 16mg q8hr IV/PO for 3 days if patient > 11weeks. Taper dosing over 2 weeks (decrease dose by 1/2 q 3 days)^{6,7}
 Pepcid for PUD prophylaxis 20 mg IV q12 hrs:

Emesis stops

Emesis continues after 24 hours of therapy

Emesis stops

Consider placement of D or J-tube⁸ via Interventional Radiology and dietary consult for liquid caloric supplementation⁹

Emesis stops

Emesis continues

-Psychiatry consult for assessment of secondary gain issues.
 -GI consult for assessment of H.pylori¹⁰

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Hyperemesis References

- 1. Broussard C, Richter J. Nausea and vomiting of pregnancy. Gastroenterology Clinics 1998; 27:123-51.**

Hyperemesis gravidarum (HEG) has an incidence of 0.3-2.0% of all deliveries and is characterized by intractable nausea and vomiting, causing dehydration, electrolyte and metabolic disturbances and nutritional deficiency necessitating hospitalization.

- 2. Broussard C, Richter J. Nausea and vomiting of pregnancy. Gastroenterology Clinics 1998; 27:123-51.**

Thyroid function abnormalities are transient and concurrent with HEG...whether these abnormalities represent true hyperthyroidism vs. a biochemical alteration of pregnancy has been questioned because T3 is not consistently elevated.

- 3. Association of Professors of Gynecology and Obstetrics. Nausea and vomiting of pregnancy. APGO Educational Series on Women's Health Issues. 2001.**

Use Lactated Ringer's solution to correct hypovolemia. Large volumes of normal saline may cause hyperchloremic acidosis. Thiamine supplementation should be administered to anyone requiring IV hydration that has vomited for more than 3 weeks.

- 4. Association of Professors of Gynecology and Obstetrics. Nausea and vomiting of Ppregnancy. APGO Educational Series on Women's Health Issues. Washington, DC. 2001.**

Combinations of anti-nauseant/antiemetic agents (H1-receptor antagonists and phenothiazines) are commonly used to treat NVP, but their anticholinergic properties may cause drowsiness, dry mouth/eyes, urinary hesitancy, and extrapyramidal effects.

- 5. Magee L, Mazzotta P, Koren G. Evidence-based view of safety and effectiveness of pharmacologic therapy for nausea and vomiting of pregnancy (NVP). Am J Obstet Gynecol 2002; 186: S256-61.**

No malformation was reported with first trimester exposure to ondansetron in a randomized controlled trial of first trimester patients. Compared with promethazine, ondansetron offered no benefits.... Its use should be reserved until other agents have failed.

- 6. Safari H, Fassett M, Souter I, Alsulyman O, Goodwin T. The efficacy of methylprednisolone in the treatment of hyperemesis gravidarum: A randomized, double-blind, controlled study. Am J Obstet Gynecol 1998; 179: 921-4.**

Patients treated with methylprednisolone had a lesser number of readmissions for hyperemesis, a greater sense of well-being, more appetite and more weight gain.

- 7. Magee L, Mazzotta P, Koren G. Evidence-based view of safety and effectiveness of pharmacologic therapy for nausea and vomiting of pregnancy (NVP). Am J Obstet Gynecol 2002; 186: S256-61.**

The pooled relative risk for major malformations in cohort and case-control studies was not significantly increased. However, a significant, but small increase in oral clefts was found in pooled case-control studies on steroid use.

- 8. Hsu J, Clark-Glena R, Nelson D and Kim C. Nasogastric enteral feeding in the management of hyperemesis gravidarum. Obstet Gynecol 1996;88: 343-6.**

Enteral nutrition has less potential for serious complications than TPN (i.e. thrombosis, infection, pneumothorax, intrahepatic cholestasis, fatty infiltration of the placenta), and is substantially cheaper.

9. UNC Dept of Nutrition, personal communication, June 5, 2002. *Nutritional requirements of pregnancy:*

- Basic energy expenditure = $655 + (9.6X \text{ wt in kg}) + (1.7X \text{ ht in cm}) - (4.7X \text{ age in yrs})$

- Total energy requirements (kcal) = BEE X activity factor (1.2 - 1.3) + additional kcal per trimester as follows:

(singletons: first trimester=100, second =200, third=300 kcal)

(multiples, add extra 200, 400 and 500 kcal, respectively for each fetus)

- Total protein needs: 0.8 - 1.0g/kg + 10g (add 30g more per additional fetus).

10. Erdem A, Arlan M, Erdem M, Yildirim G, Himmetoglu O. Detection of Helicobacter pylori seropositivity in hyperemesis gravidarum and correlation with symptoms. Am J Perinatol 2002; 19: 87-92. and Jacoby E, Porter K. Helicobacter pylori infection and persistent hyperemesis gravidarum. Am J Perinatol 1999; 16: 85-8. *Erdem found no direct causal relationship between H. pylori infection and HEG. Jacoby described successful treatment of 3 persistent HEG cases with clarithromycin and amoxicillin. However, consideration must be given to the possible harmful effects of clarithromycin in pregnancy, as well as a 2-5% rate of resistance of H. pylori. .*

11. Smith C, Crowther C, Beilby J. Acupuncture to treat nausea and vomiting in early pregnancy: A randomized controlled trial. Birth. 2002; 29: 1-9. *Acupuncture did not seem to affect vomiting, but those who received it reported less nausea and fewer dry retching episodes, and increased feelings of vitality, physical function and mental health.*

NOTIFICATION TO USERS

These algorithms are designed to assist the primary care provider in the clinical management of a variety of problems that occur in pregnancy. They should not be interpreted as *standard of care* but instead represent *guidelines* for the management of these patients. Variation in practice should be taken into account such factors as characteristics of the individual patient, health resources, and regional experience with diagnostic and therapeutic modalities. The algorithms remain the intellectual property of the University of North Carolina School of Medicine at Chapel Hill. They cannot be reproduced in whole or part without the *expressed* permission of the school.

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