Hyperemesis Gravidarum: A Review
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Nausea and vomiting commonly labeled as "morning sickness" are common symptoms of pregnancy. They can appear within two weeks after a missed period, usually diminish by the 14th week in up to 50% of pregnant women. If it begins after twelve weeks of gestation there may be a medical or surgical cause. If vomiting is of such intensity that it interferes with normal activity it is pathological1.

Causes of vomiting in pregnancy

Early pregnancy
- Morning sickness
- Hyperemesis gravidarum
- Associated causes

Late pregnancy
- Severe PET
- Urinary tract infection
- Acute hydranmios

Hyperemesis gravidarum is defined as excessive vomiting and nausea occurring before 20th week of gestation. The vomiting is intractable, occur irrespective of food and severe enough to require hospitalization. It is complicated by weight loss, dehydration, ketonuria sometimes by serious psychological disturbances. Hyperemesis can lead to sever maternal malnutrition and threaten fetal well being.

Epidemiology of Hyperemesis
The condition was described as early as 2000 BC. In an Epidemiological study 70% of all pregnancy were associated with nausea, in 91% of the case the onset was during first three months.3 This has a tendency to recur. It has been found that there was no difference of intensity, peak nausea or time of onset in successive pregnancy, however the duration decrease. There is a strong correlation between nausea and tolerance of oral contraceptives.4

Study have shown that offspring of women hospitalized for hyperemesis have higher proportion of females than do all mothers.5 It is more common in primigravida.

Incidence
Although nausea and vomiting are second most common symptom of pregnancy, the incidence of hyperemesis is 0.3%.6

Causes
It is not clear It appears that hyperemesis has complex interaction of biological, psychological and socio cultural factors.

Associated factors are the following
1. Vitamin B₆ deficiency: due to change in protein metabolism.
2. Hyperthyroidism: found in 70% of patients with hyperemesis, Human Chronic Gonadotrophin (hCG) is not directly involved in the a etiology of hyperemesis but indirectly by its ability to stimulate the thyroid.7
3. Psychopathologic and emotional factors. It has been observed that hyper emesis improves after hospitalization, being away from home environment.
4. Hyperplacentosis: A condition of heightened trophoblastic activity is characterized by increased placental weight and hCG level. Hyperplacentosis is regarded to be associated with hyperemesis8
5. Hypersensitivity reaction.
6. Poor nutrition
7. Sex steroid imbalance - Progesterone deficiency and estrogen excess often implicated and there may be adrenal and pituitary dysfunction. However, evidence shows there is

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no hypo function of anterior pituitary gland. It has been found that nausea and vomiting in early pregnancy is associated with lower cortisol and progesterone and high hCG but vomiting in late pregnancy had lower testosterone and hCG but higher dehydroepiandosterone.

8. Other factors proposed are tissue polypeptide anigen, high LDL and VLDL, low HDL, gall bladder disease and ovulation from right ovary.

Patho physiology
Pregnancy is associated with gut disturbances. These include delayed gastric emptying, reduced esophageal sphincter pressure, decreased gall bladder motility with increased gut transit times. The changes result from inhibitory action of progesterone on the gut which contribute to vomiting. However it is difficult to reconcile the decline of pregnancy sickness after first trimester and the increase of progesterone.

Clinical Feature
There is inability to retain food and fluid
- Intractable vomiting
- Dehydration
- Dry and coated tongue
- Skin turgor decrease
- Acetone breath and ketonuria
- Significant weight loss
- Jaundice and various palsy may supervene
- Metabolic acidosis

If weight loss greater than 5% of pre pregnant weight of the patient it is associated with poor fetal growth and out come.

Biochemical
- Plasma Na↓ K↓ Cl↓
- Urea↑
- Hypokalaemia
- Alkalosis
- Urine volume↑ may contain albumin and bile, chloride is absent

Pathology
The changes are generalized manifestation of starvation and severe malnutrition
- Liver: Centrilobular fatty infiltration
- Kidney: Fatty change in proximal convulated tubule
- Heart: Subendocardial hemorrhage
- Brain: Small hemorrhage in hypothalamic area
- Wernick's encephalopathy (apathy, restlessness, sleeplessness, convulsion and coma)
- Korsakoff psychosis: (Confusion, loss of memory)

Differential Diagnoses
- Hydatidiform mole
- Multiple pregnancy
- Gastroenteritis
- Cholecystitis
- Peptic ulcer
- Twisted ovarian tumour
- Intestinal obstruction

Estimation of energy requirement
Determine age, median ideal body weight, nature of physical activity, pathophysiologic state, composition of the diet. Energy requirement is calculated from following formula
- TEE= BEE+ TEF+ allowance for pathologic state
- BEE= 0.95 Kcal /Kg of IBW (ideal body weight) x24 hr
- TEF= 6-10% of BEE (IBW = Ideal body weight, TEE = Total energy expenditure, BEE = Basal energy expenditure, EES = Energy expenditure during sleep TEF = Total energy factor)

Expected provision of energy from different of nutrients

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>% of Total Energy</th>
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<tbody>
<tr>
<td>Carbohydrate</td>
<td>60%</td>
</tr>
<tr>
<td>Protein</td>
<td>10%</td>
</tr>
<tr>
<td>Fat</td>
<td>30%</td>
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Protein (0.8gm/kg)
Carbohydrate 50% - is considered as a safe ration 10% - 15 % of total energy
Fat 25% - 30% of total energy (Vegetable 200 - 400 g/day)

**Vitamins and Minerals** 50 - 100 mg

**Management**

Principle is prevention of dehydration and starvation

- To record pulse, BP, temperature, respiration, weight on admission and daily weight measurement
- Estimation of electrolytes, BUN, glucose, creatinine routinely as well as periodically
- Parenteral nutrition—Maintenance with recommended dietary allowance of carbohydrate, amino acid, fat emulsions, vitamins (B complex, C) and trace elements. Traditionally parenteral therapy is done. Study have shown women nutritionally supported with parenteral therapy have longer hospitalization with increased incidence of venous thrombosis, cellulitis, line sepsis, bacterial endocarditis and pneumonia.
- Gastric rest by not allowing oral intake. Enteral nutrition by self-propelling, blind placed nasojejunal tube is recommended as an alternative to parenteral therapy. This is well tolerated, cost effective with less complications and can be maintained at home.

- **Antiemetics**

- **Mild sedatives**

- Psychiatric consultation, isolation from family may be helpful
- H2 blocker (cimetidine), proton pump blocker (Omeprazole) may be used
- Corticosteroids may be used Subcutaneous metadopramide are recommended.
- Nutritional assessment should be done. Antiemetics or mild sedatives, IM promethazine. (Phenergan 25-50 mg), orally Phenobarbitone one hour before meal and bed time.
- Vitamin B complex, Vitamin C, B6, (100 mg), added to IV saline, may be useful. Small sips of water 30 ml may be initiated.
- Then small frequent meals, consisting of dry and easily digested foods, fruit drinks tea and milk liquid to semisolids (e.g. boiled egg, cooked, cereals, toast, dry crackers).
- Avoid recumbent position after food, use extra pillow during sleep, take fluid between meals
- Discourage the intake of plain water if vomiting is prolonged. Instead, encourage the frequent intake of small volumes of fluids containing electrolytes.
- Alter physical environment as much as possible to lessen stimuli for nausea (e.g., remove sources of unpleasant odors).
- Promote bed rest when vomiting is severe; avoid quick movements because they often make nausea more severe.

- Monitoring needs of patients with hyperemesis gravidarum include daily weights, fluid intake and output, vital signs, and laboratory measures of electrolytes and general metabolic status (including potassium, sodium, BUN, glucose, and serum creatinine levels).

**Termination of Pregnancy**

The indications are

- A steady deterioration in spite of therapy
- Rising pulse rate of 100/minute or over
- Temperature persistently above 100.4oF
- Gradually increasing oliguria and proteinuria
- Appearance of jaundice
- Appearance of neurological manifestations
Complication
Wernicke's encephalopathy - an unusually fatal medical emergency due to thiamine deficiency can be found in patients with prolong hyperemesis.\textsuperscript{13}

Conclusion
Hyperemesis is a disease that exist as a potential threat to maternal well being during pregnancy. Early recognition and prompt intervention could prevent the complication and ameliorate maternal suffering quickly.

References