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Hyperemesis Gravidarum: Clinical Management and Nursing Care in Obstetric Practice- An Updated Review

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Abstract

Background: Hyperemesis gravidarum (HG) is the most severe form of nausea and vomiting in pregnancy, marked by persistent vomiting, dehydration, weight loss exceeding 5% of prepregnancy weight, and significant metabolic disturbances. Unlike typical nausea and vomiting of pregnancy, HG follows a pathological course, often requiring hospitalization and posing risks of nutritional deficiencies, electrolyte imbalance, and complications such as Wernicke encephalopathy.

Aim: This review aims to provide an updated, comprehensive overview of the etiology, clinical features, evaluation, and management of hyperemesis gravidarum, with emphasis on evidence-based medical and nursing practices.

Methods: A narrative synthesis of current literature, clinical guidelines, and recent research was used to examine key aspects of HG, including hormonal, genetic, physiological, and psychosocial determinants, as well as clinical assessment tools, treatment strategies, and multidisciplinary care considerations.

Results: Evidence indicates that HG is multifactorial, involving hormonal changes, genetic susceptibility, gastrointestinal adaptations, and neuroendocrine mechanisms. Diagnosis remains clinical and requires exclusion of other conditions. Effective management relies on a stepwise approach, starting with dietary and lifestyle modifications, progressing to antiemetic therapy, and escalating to enteral or parenteral nutrition when necessary. Psychological effects are significant, with increased rates of anxiety, depression, and reduced quality of life. The Pregnancy-Unique Quantification of Emesis and Nausea (PUQE) score provides objective assessment of severity.

Conclusion: Early recognition, structured treatment, and coordinated interdisciplinary care improve maternal recovery and fetal outcomes. Comprehensive management—including medical therapy, nutritional support, and psychological care—is essential for reducing complications and improving quality of life.

Keywords: Hyperemesis gravidarum, pregnancy, nausea and vomiting, maternal health, clinical management, nutritional support, PUQE score.

Introduction

Hyperemesis gravidarum constitutes the most severe clinical manifestation of nausea and vomiting associated with pregnancy, a physiological phenomenon experienced by the majority of pregnant individuals with varying intensity. In contrast to typical nausea and vomiting of pregnancy, which usually emerges shortly after the first missed menstrual cycle, reaches maximal intensity between the eighth and twelfth weeks of gestation, and gradually subsides as pregnancy advances into the second trimester, hyperemesis gravidarum follows a distinctly pathological course. It is marked by intractable vomiting, clinically significant maternal weight loss commonly exceeding five percent of prepregnancy body weight, dehydration, and substantial metabolic derangements. As a result, hyperemesis gravidarum represents one of the most frequent indications for hospitalization during early pregnancy [1][2][1]. Diagnosis is largely clinical and relies on the exclusion of alternative medical or surgical causes of persistent vomiting. Supportive diagnostic features often include ketonuria, postural hypotension, and disturbances in serum electrolyte levels, which collectively reflect the severity of nutritional and fluid depletion [1][2]. If inadequately managed, serious complications may develop, including Wernicke encephalopathy and other consequences of micronutrient deficiency [3][2]. Despite its clinical significance, there is no universally accepted diagnostic threshold or standardized criterion for hospital admission in cases of hyperemesis gravidarum. This lack of consensus frequently results in repeated outpatient evaluations before definitive inpatient management is initiated. Hospital admission is generally considered appropriate when patients are unable to maintain adequate oral intake, fail to respond to oral antiemetic therapy, or exhibit laboratory abnormalities or comorbid conditions requiring close medical supervision [3][2]. The cornerstone of inpatient management involves prompt physiological stabilization through intravenous fluid resuscitation and correction of electrolyte imbalances. Prophylactic administration of thiamine and comprehensive vitamin

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supplementation is essential to mitigate the risk of neurological sequelae. Antiemetic therapy is typically delivered via the intravenous route, with pharmacological selection individualized according to clinical response and patient-specific factors. Nevertheless, symptom recurrence remains common, and many patients experience repeated hospital admissions. Beyond its physical burden, hyperemesis gravidarum exerts a profound negative effect on maternal well-being, family functioning, and overall quality of life, and it often poses considerable therapeutic challenges [4]. Consequently, timely identification and early, structured intervention are critical to optimizing both maternal and fetal outcomes.

Etiology

The etiology of hyperemesis gravidarum is complex and reflects the interaction of multiple biological systems rather than a single causative factor. Current evidence supports a multifactorial model in which hormonal alterations of early pregnancy interact with genetic susceptibility and individual physiological responses, while environmental and psychosocial influences may modify disease expression. This complexity explains the wide variability in clinical severity and treatment response observed among affected individuals. Hormonal changes during early gestation have received the greatest attention in etiological research. Human chorionic gonadotropin has been strongly associated with hyperemesis gravidarum because the temporal peak of circulating levels closely parallels the onset and maximum intensity of symptoms. In addition, the thyroid stimulating properties of human chorionic gonadotropin may contribute to transient biochemical hyperthyroidism observed in a subset of patients, which can aggravate nausea and vomiting [5]. Nevertheless, research findings remain inconsistent, and differences in human chorionic gonadotropin isoforms and receptor sensitivity suggest that this hormone alone cannot fully explain disease development. Estrogen, particularly estradiol, has also been investigated due to its known effects on the central nervous system and gastrointestinal tract. Some studies report elevated estrogen concentrations in affected individuals, while others fail to confirm this association. Pregnancy related gastrointestinal adaptations, including delayed gastric emptying and reduced lower esophageal sphincter tone influenced by progesterone and estrogen, may intensify nausea and vomiting, although these physiological changes are common in normal pregnancy and are not specific to hyperemesis gravidarum [1][5].

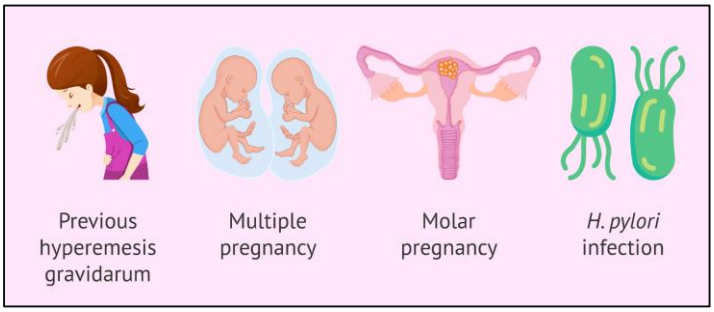

Fig. 1: Risk Factors.

Genetic predisposition has emerged as a significant contributor to disease risk. Familial aggregation and high recurrence rates in subsequent pregnancies support a heritable component. Recent molecular studies have identified associations with variants in genes such as GDF15, IGFBP7, and PGR, which play roles in placental development, appetite regulation, hormonal signaling, and inflammatory pathways. These findings suggest that altered placental signaling and maternal metabolic adaptation may underlie symptom severity in genetically susceptible individuals [1][5]. Physiological susceptibility also appears to influence disease expression. Individuals with a personal or family history of hyperemesis gravidarum, motion sickness, or migraine related nausea demonstrate a higher likelihood of developing the condition, indicating shared neurobiological pathways involved in nausea perception and vestibular sensitivity [1]. Psychological factors have been extensively examined, yet current evidence indicates that conditions such as anxiety and depression are more commonly consequences rather than primary causes of hyperemesis gravidarum. Although one study reported comorbid depression or anxiety in approximately 57.4 percent of affected patients, most women do not have a documented psychiatric diagnosis prior to pregnancy, reinforcing the concept that psychological distress often arises secondary to prolonged illness and functional impairment [5]. Several medical and obstetric factors further modify risk. A personal history of hyperemesis gravidarum remains the strongest predictor of recurrence, with an estimated recurrence rate of approximately 24 percent. A positive maternal history substantially increases risk, suggesting intergenerational transmission. Comorbid conditions including thyroid dysfunction, type 1 diabetes mellitus, hypercholesterolemia, and Helicobacter pylori infection have been associated with increased disease prevalence, although a direct causal relationship has not been definitively established [1][5]. Conversely, early multivitamin use prior to six weeks of gestation and maternal cigarette smoking have been associated with reduced risk, though the latter cannot be recommended due to its well documented adverse health effects [2][5].

Epidemiology

Nausea and vomiting are among the most frequently reported symptoms of pregnancy, with nausea affecting approximately 50 to 80 percent of pregnant individuals and vomiting occurring in nearly half of all pregnancies. Hyperemesis gravidarum represents a far less common but considerably more severe condition, affecting an estimated 0.3 to 3 percent of pregnancies worldwide. The global prevalence is commonly cited at approximately 1.1 percent, although substantial variability exists across epidemiological studies [2]. This wide range is largely attributable to the absence of standardized diagnostic criteria, differences in study design, and variation in population characteristics, including ethnicity and access to healthcare services [2]. Despite its relatively low prevalence, hyperemesis gravidarum carries a disproportionate clinical and healthcare burden. It is recognized as the most frequent cause of hospitalization during the first trimester of pregnancy and is the second leading reason for inpatient admission throughout gestation, surpassed only by preterm labor [1][6]. This high rate of hospitalization reflects the severity of symptoms, the risk of dehydration and metabolic complications, and the frequent failure of outpatient management strategies. Recent epidemiological data indicate a paradoxical trend in healthcare utilization. Although overall pregnancy rates have declined in several regions, the number of emergency department visits attributed to hyperemesis gravidarum has continued to rise [6]. This increase may reflect greater awareness of the condition, improved recognition of severe cases, and changing thresholds for hospital-based care. It may also indicate an increasing disease burden or shifts in maternal demographics. Sociodemographic factors further influence disease distribution. Hyperemesis gravidarum has been reported more frequently among pregnant individuals younger than 24 years and among those from lower income groups when compared with older patients and those of higher socioeconomic status [6]. These disparities may be related to differences in nutritional status, access to early prenatal care, health literacy, and social support systems. Collectively, epidemiological evidence underscores that hyperemesis gravidarum, while uncommon, remains a significant contributor to maternal morbidity and healthcare utilization during pregnancy, warranting continued attention in both clinical practice and public health research.

Pathophysiology

The underlying pathophysiology of hyperemesis gravidarum has not been fully elucidated, and no single mechanism adequately explains its onset or clinical severity. Current evidence supports the presence of multiple interacting biological processes that exceed the expected physiological adaptations of normal pregnancy. Although several theories have been proposed to explain disease development, these mechanisms remain incompletely defined and are likely interdependent rather than mutually exclusive. Further details regarding contributory factors are discussed in the Etiology section. Pregnancy is associated with extensive physiological and anatomical changes that involve nearly all organ systems, including the cardiovascular, endocrine, hematologic, renal, and gastrointestinal systems. These adaptations evolve progressively with advancing gestation and account for many common gestational symptoms. Within the gastrointestinal tract, rising progesterone levels lead to a reduction in smooth muscle contractility, resulting in delayed gastric emptying and prolonged intestinal transit time. At the same time, increased placental production of gastrin stimulates gastric acid secretion. As gestation progresses, uterine enlargement alters intra-abdominal anatomy, displacing abdominal viscera and increasing intra-abdominal pressure. These mechanical changes, together with hormonally mediated relaxation of smooth muscle, contribute to reduced lower esophageal sphincter tone and an increased propensity for gastroesophageal reflux. Collectively, these changes explain the high prevalence of nausea, vomiting, early satiety, constipation, and reflux observed in uncomplicated pregnancies [3]. Despite the universality of these physiological changes, they are not sufficient to account for the severity observed in hyperemesis gravidarum. Most pregnant individuals experience some degree of nausea or vomiting without developing significant metabolic or nutritional compromise. This distinction suggests that hyperemesis gravidarum involves pathological mechanisms that extend beyond normal gestational adaptation. Current hypotheses propose that an exaggerated or abnormal response to pregnancy related hormones, particularly human chorionic gonadotropin, may play a central role. This abnormal response may be modulated by individual genetic susceptibility, altered placental signaling, immune system interactions, and variations in gastrointestinal sensory and motor function. Emerging evidence also supports a possible neuroendocrine and immunological component, in which central nausea pathways and inflammatory mediators contribute to symptom persistence and severity. Although nausea and vomiting are common features of early pregnancy, hyperemesis gravidarum represents an extreme clinical phenotype characterized by sustained vomiting, dehydration, and metabolic imbalance. This distinction reinforces the view that hyperemesis gravidarum arises from a convergence of physiological stressors and maladaptive biological responses, rather than from the normal hormonal and anatomical changes of pregnancy alone [3].

History and Physical

A comprehensive clinical history is fundamental to the evaluation of patients with suspected or established hyperemesis gravidarum. History taking should begin with confirmation of pregnancy and accurate estimation of gestational age, followed by documentation of obstetric history,

including complications in previous pregnancies and any prior episodes of hyperemesis gravidarum. Detailed assessment of symptom severity is essential and should include the frequency, duration, and persistence of nausea and vomiting, the degree of functional impairment, and the ability to tolerate oral intake. Clinicians should also document all therapeutic measures previously attempted, such as dietary modifications or pharmacologic interventions, and evaluate the patient's response to these treatments [7]. Further characterization of symptoms should address the timing of onset and associated features. Hyperemesis gravidarum is typically marked by persistent and severe vomiting that begins in the first trimester and may extend well beyond the period associated with uncomplicated nausea and vomiting of pregnancy. Symptoms most commonly arise around six weeks of gestation and resolve between sixteen and twenty weeks, although approximately one fifth of affected individuals experience symptoms throughout the entire pregnancy [8]. When nausea and vomiting present for the first time after nine weeks of gestation, clinicians should maintain a high index of suspicion for alternative diagnoses, including gallbladder disease, diabetic gastroparesis, or other gastrointestinal pathology [2][3]. Unlike mild gestational nausea, hyperemesis gravidarum profoundly compromises nutritional and fluid intake. Patients frequently report significant weight loss exceeding five percent of prepregnancy body weight, along with symptoms such as xerostomia, constipation, marked fatigue, and inability to perform routine daily activities. These features reflect the systemic impact of prolonged vomiting and inadequate caloric intake [3].

Physical examination should focus on identifying the consequences of sustained vomiting and dehydration, as well as excluding other potential causes of symptoms. Assessment of maternal vital signs is critical and should include blood pressure, heart rate, and evaluation for orthostatic changes. Examination of mucous membranes, capillary refill, and skin turgor provides valuable information regarding intravascular volume status. Maternal weight should be recorded and compared with baseline values to quantify ongoing weight loss. When gestational age permits, fetal heart rate assessment should be performed. Abdominal and pelvic examinations are indicated when pain, tenderness, or other atypical features are present. Prolonged nutritional deprivation may result in protein energy malnutrition and multiple vitamin deficiencies. Vitamin K deficiency may manifest as abnormal bleeding, while deficiencies of thiamine, pyridoxine, and cobalamin can produce neurological signs. Thiamine deficiency is of particular concern, as it may progress to Wernicke encephalopathy, characterized by confusion, ocular movement abnormalities, and ataxia [2][3][9]. Although most cases of hyperemesis gravidarum are idiopathic, atypical physical findings such as fever, focal neurological deficits, or persistent abdominal pain necessitate evaluation for alternative or coexisting conditions. Transient thyroid function abnormalities, including elevated free thyroxine and suppressed thyroid stimulating hormone levels, may occur but are typically self limiting and should be managed conservatively without antithyroid therapy [3].

Evaluation

The evaluation of hyperemesis gravidarum requires a comprehensive clinical approach that integrates detailed history and physical examination with targeted laboratory investigations and selective imaging studies. The primary objectives are to confirm the diagnosis, determine disease severity, assess maternal and fetal risk, and exclude alternative causes of persistent nausea and vomiting during pregnancy. At present, no universally accepted diagnostic criteria exist for hyperemesis gravidarum, which contributes to variability in clinical practice and research definitions [1]. In most cases, diagnosis is established through a constellation of findings that include early onset of severe nausea and vomiting, clinically significant weight loss, evidence of dehydration, and supportive laboratory abnormalities [3][1]. Laboratory evaluation plays a central role in assessing the physiological consequences of prolonged vomiting and limited oral intake. Common abnormalities reflect volume depletion and electrolyte derangement, including elevated blood urea nitrogen and creatinine levels, hyponatremia, and hypokalemia. Ketonuria is frequently detected and reflects a catabolic state secondary to inadequate caloric intake and fat metabolism. Although ketonuria is not diagnostic in isolation, it is widely recognized as a supportive marker of disease severity and is incorporated into guidance from professional organizations such as the American College of Obstetricians and Gynecologists and the Society of Obstetricians and Gynaecologists of Canada [1]. Its presence may influence decisions regarding hospitalization, intravenous fluid therapy, and nutritional support [3][1]. Severe dehydration may progress to acute kidney injury, manifested by rising creatinine and blood urea nitrogen concentrations and reduced renal function. Electrolyte disturbances involving potassium, sodium, calcium, magnesium, and bicarbonate are common and may predispose patients to neuromuscular or cardiac complications. Additional laboratory testing may be warranted in selected cases, particularly when fever, abdominal pain, or thyroid disease is suspected. These investigations may include thyroid function tests, liver enzymes, lipase, and urinalysis to exclude alternative or coexisting conditions [1][2][10].

Prolonged malnutrition may result in coagulation abnormalities, including prolonged

prothrombin time or elevated international normalized ratio due to vitamin K deficiency. Hemoconcentration may be reflected by elevated hemoglobin or hematocrit levels, whereas anemia, when present, should be carefully evaluated to distinguish nutritional deficiency from pregnancy related hypertensive disorders. Hepatic involvement is common, with up to half of patients demonstrating mild to moderate transaminase elevations. Aminotransferase levels typically rise less than threefold, although rare cases may show marked elevations. Transient cholestasis with mild hyperbilirubinemia can also occur, necessitating monitoring to exclude primary liver disease when clinical features are atypical [3][1]. Imaging is not routinely required for diagnosis but is valuable in excluding other pathology. Abdominal ultrasonography may be indicated in the presence of significant liver enzyme elevation or suspected biliary disease. Fetal growth surveillance is recommended in cases of prolonged disease or maternal malnutrition, particularly later in gestation. When complications are suspected, imaging should be guided by clinical urgency, with preference for radiation minimizing modalities such as magnetic resonance imaging when feasible [3][1].

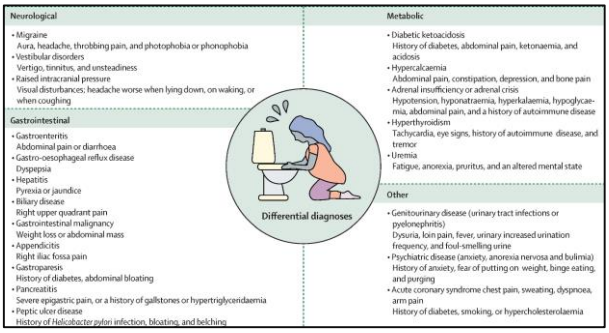

Fig. 2: Different causes of hyperemesis gravidarum.

Treatment / Management

The management of hyperemesis gravidarum is guided by symptom severity, the degree of dehydration, nutritional status, and the patient's ability to tolerate oral intake. Current practice is informed by the nausea and vomiting of pregnancy guidelines issued by the American College of Obstetricians and Gynecologists, which recommend a structured, stepwise approach to therapy. Management typically begins with conservative and lifestyle based measures, progresses to pharmacologic interventions, and advances to nutritional support in cases that are refractory to standard treatment [1][3]. This tiered strategy allows care to be individualized while minimizing maternal morbidity and supporting optimal fetal development. Outpatient management is appropriate for patients with mild to moderate symptoms who are able to maintain some oral intake and show no evidence of significant dehydration or metabolic derangement. Early intervention in this setting is critical, as timely symptom control has been shown to reduce emergency department visits, prevent hospital admission, and improve quality of life. Although some pharmacologic therapies have raised concerns regarding fetal safety, available evidence indicates that, in severe cases, the benefits of effective symptom control generally outweigh potential risks [11][5]. Ongoing monitoring and frequent reassessment are essential to ensure clinical stability and to identify early signs of deterioration. Initial outpatient therapy often focuses on conservative measures. Modification of prenatal vitamin regimens, particularly replacing standard multivitamin formulations with folic acid alone, may reduce nausea in some patients [2]. Ginger has been widely used as a complementary therapy and has demonstrated efficacy in reducing nausea through interactions with multiple neural pathways involved in emesis. Oral doses of up to one gram daily are generally considered safe, although caution is advised in patients receiving anticoagulant therapy due to potential effects on platelet function [2][12][13]. Nonpharmacologic interventions such as acupressure or acupuncture, particularly stimulation of wrist acupoints, have produced mixed results in clinical studies. While evidence for efficacy remains inconsistent, these interventions are noninvasive and considered safe, making them reasonable adjuncts in selected patients [5][2].

When conservative measures fail to provide adequate symptom relief, pharmacologic therapy is introduced in a stepwise fashion. First line treatment typically includes pyridoxine, either alone or in combination with doxylamine. Pyridoxine administered in divided doses has demonstrated benefit in mild to moderate disease, while the addition of doxylamine enhances antiemetic efficacy. Combination formulations are commonly used and can be titrated according to symptom severity. Although pyridoxine is generally well tolerated, excessive dosing should be avoided due to the risk of peripheral neuropathy [2][3]. If symptoms persist, second line agents are added. Antihistamines such as dimenhydrinate and diphenhydramine may provide additional relief but are frequently associated with sedation. Dopamine antagonists including promethazine and prochlorperazine are also effective but carry a risk of extrapyramidal symptoms and sedation, necessitating careful patient selection and monitoring [2]. Third line therapy is reserved for patients with ongoing vomiting despite earlier interventions and without evidence of significant dehydration. Agents such as metoclopramide offer both prokinetic and antiemetic effects, while ondansetron has been shown to be highly effective and is widely used in clinical practice. Although some studies have raised concerns regarding potential associations with congenital anomalies, the overall evidence supports its use when clinically indicated. Trimethobenzamide administered intramuscularly represents another option in refractory cases [2].

Inpatient management is indicated when outpatient therapy fails or when patients present with

persistent vomiting, dehydration requiring intravenous fluids, significant electrolyte abnormalities, or comorbid conditions requiring close observation. Hospitalization permits gastrointestinal rest, rapid correction of metabolic derangements, and initiation of parenteral therapies, thereby reducing the risk of serious complications and facilitating transition back to outpatient care [1]. Initial inpatient treatment centers on intravenous fluid resuscitation using isotonic crystalloids or lactated Ringer's solution, with careful monitoring of urine output and electrolyte balance. Thiamine supplementation is essential and should be administered early to prevent Wernicke encephalopathy, alongside intravenous multivitamin therapy until oral intake is reestablished. Intravenous antiemetics are administered in regimens similar to oral dosing, often in combination with acid suppressive therapy. Caution is required when using multiple agents due to the risk of drug interactions, including QT prolongation and extrapyramidal effects [1][2]. Nutritional support becomes critical when oral intake remains inadequate despite optimal medical therapy. Enteral nutrition is generally preferred, with nasogastric feeding often employed initially. Alternative enteral routes may be considered when prolonged support is required or tolerance is poor. Although technical challenges exist, enteral feeding is associated with improved maternal weight outcomes and earlier symptom improvement compared with parenteral approaches [3]. Parenteral nutrition is reserved for patients in whom enteral feeding is not feasible and should be used judiciously due to risks such as infection and thrombosis, which are heightened during pregnancy [3]. Careful calculation of caloric and protein requirements is necessary to prevent ketosis and promote fetal growth. Adequate hydration and supplementation of essential micronutrients are vital, as many affected patients consume substantially less than recommended daily allowances. Regular laboratory monitoring is required to guide supplementation and ensure metabolic stability [3].

In refractory cases, alternative therapies may be considered. Agents such as mirtazapine, olanzapine, and short courses of corticosteroids have demonstrated benefit in select patients. Corticosteroid use should be limited and avoided early in gestation due to potential fetal risks, with dosing strategies aimed at achieving symptom control while minimizing exposure [1]. Emerging therapies including gabapentin, clonidine, diazepam, and droperidol have shown promise in clinical studies, though their use remains individualized and guided by specialist input [5]. Given the substantial psychological burden associated with severe hyperemesis gravidarum, comprehensive management should also include psychological assessment and support. Increased rates of anxiety, depression, and posttraumatic stress disorder have been reported, underscoring the importance of addressing mental health alongside physical symptoms to achieve optimal outcomes [14].

Differential Diagnosis

The evaluation of pregnant individuals presenting with severe nausea and vomiting requires careful consideration of alternative diagnoses, as hyperemesis gravidarum is primarily a clinical diagnosis of exclusion. Early assessment should include exclusion of pregnancy related conditions known to produce exaggerated gastrointestinal symptoms, particularly gestational trophoblastic disease and multiple gestations. Both conditions are associated with markedly elevated levels of human chorionic gonadotropin and may present with pronounced nausea and vomiting during the first trimester. Obstetric ultrasonography is therefore a critical initial investigation, as it can reliably confirm gestational age, identify multifetal pregnancy, and detect molar changes in most cases. Beyond obstetric etiologies, a broad range of nonobstetrical conditions must be considered, as pregnancy does not preclude the occurrence of acute or chronic medical disorders. Gastrointestinal causes represent a substantial portion of the differential diagnosis and include infectious processes such as gastroenteritis, motility disorders including gastroparesis and achalasia, and structural or inflammatory conditions such as biliary tract disease, hepatitis, intestinal obstruction, peptic ulcer disease, pancreatitis, and appendicitis. These conditions may present with overlapping symptoms but are often distinguished by associated features such as abdominal pain, fever, laboratory abnormalities, or atypical timing of symptom onset.

Genitourinary disorders may also mimic or coexist with hyperemesis gravidarum. Pyelonephritis, uremia, nephrolithiasis, ovarian torsion, and degenerating uterine leiomyomas can produce nausea and vomiting secondary to pain, infection, or metabolic disturbance. Metabolic and endocrine conditions must be carefully evaluated, particularly diabetic ketoacidosis, porphyria, adrenal insufficiency, hyperthyroidism, and hyperparathyroidism, as delayed diagnosis may result in significant maternal and fetal morbidity. Neurological conditions such as pseudotumor cerebri, vestibular disorders, migraine headaches, intracranial tumors, and lymphocytic hypophysitis should be considered when nausea and vomiting are accompanied by headache, visual changes, focal neurological deficits, or altered mental status. Additionally, medication related toxicity or intolerance can precipitate gastrointestinal symptoms and should be reviewed during history taking. Psychological conditions, including anxiety and depressive disorders, may exacerbate symptom perception but should not be presumed to be primary causes without exclusion of organic pathology.

Pregnancy specific disorders later in gestation, such as acute fatty liver of pregnancy and preeclampsia, can also manifest with nausea and vomiting and must be considered when symptoms occur beyond the first trimester or are accompanied by hypertension, liver dysfunction, or systemic signs. Thorough clinical evaluation, appropriate laboratory testing, and selective imaging are therefore essential to distinguish hyperemesis gravidarum from other potentially serious conditions and to ensure accurate diagnosis and timely management [2][3].

Staging

Modified Pregnancy-Unique Quantification of Emesis and Nausea Score

Accurate staging of hyperemesis gravidarum remains challenging because no single clinical or biochemical marker can fully capture symptom severity, disease progression, or response to treatment. To address this gap, the Pregnancy-Unique Quantification of Emesis and Nausea score was developed as a standardized, pregnancy-specific assessment tool to quantify nausea and vomiting severity. The PUQE questionnaire is concise and clinically practical, consisting of three core questions that evaluate the duration of nausea, the frequency of vomiting, and the frequency of retching, alongside a global assessment of the patient's physical and psychological quality of life. The original PUQE tool assessed symptoms over the preceding twelve hours; however, subsequent modifications expanded its scope to a twenty-four-hour assessment period and, in some applications, to the entire first trimester of pregnancy [15]. These adaptations improved its clinical relevance by capturing symptom fluctuations over a more representative timeframe. Validation studies have demonstrated that higher PUQE scores correlate strongly with clinically meaningful outcomes, including reduced ability to tolerate oral iron supplementation, increased risk of hospitalization for severe nausea and vomiting of pregnancy or hyperemesis gravidarum, higher healthcare utilization and costs, and substantial reductions in maternal well-being and quality of life. As such, the PUQE score is increasingly used to guide clinical decision-making, monitor treatment response, and facilitate communication between healthcare providers.

Prognosis

Because hyperemesis gravidarum affects both the pregnant individual and the developing fetus, prognosis must be considered from both maternal and fetal perspectives.

Maternal Prognosis

The maternal prognosis of hyperemesis gravidarum is generally favorable when the condition is recognized early and managed appropriately. With timely intervention that includes pharmacologic therapy, hydration, nutritional support, and close monitoring, most patients recover without long-term sequelae [2][3][1]. Restoration of adequate nutritional intake, whether through oral, enteral, or parenteral means, plays a central role in symptom resolution and maternal weight stabilization. Enteral nutrition has been associated with improved maternal outcomes, while parenteral nutrition remains an important option for severe or refractory cases. Ongoing surveillance is essential to prevent serious complications, particularly refeeding syndrome and micronutrient deficiencies. Thiamine depletion remains a critical concern, as delayed supplementation can result in irreversible neurological injury. Although hyperemesis gravidarum imposes a substantial physical and emotional burden, proactive, multidisciplinary management significantly reduces maternal morbidity and improves overall recovery [2][3][1].

Fetal Prognosis

The long-term fetal prognosis associated with hyperemesis gravidarum has been the subject of increasing investigation. Large population-based studies suggest a modest increase in adverse neurodevelopmental and psychological outcomes among offspring exposed in utero. A systematic review involving nearly 1.8 million children identified associations between hyperemesis gravidarum exposure and increased rates of neurodevelopmental disorders, anxiety, sleep disturbances, and, in male offspring, a possible elevated risk of testicular cancer extending into adulthood [16]. Additional studies have reported higher incidences of attention-deficit hyperactivity disorder, autism spectrum disorder, and cognitive or motor delays. Neuroimaging research has also demonstrated reduced cortical brain volumes in exposed offspring. Although these findings suggest a small but measurable long-term risk, the evidence base remains limited, and further large-scale, well-controlled studies are required to establish causality and clarify underlying mechanisms [16].

Complications

When severe or inadequately treated, hyperemesis gravidarum can result in a wide range of maternal complications. Persistent vomiting commonly leads to dehydration, electrolyte disturbances, urinary tract infections, and esophageal irritation or injury. Severe electrolyte imbalance may precipitate cardiac arrhythmias, rhabdomyolysis, and profound nutritional deficiencies. One of the most serious complications is Wernicke encephalopathy, caused by thiamine deficiency, which presents with confusion, ocular motor dysfunction, gait instability, and memory impairment [1]. Vitamin K deficiency may lead to coagulopathy and increased bleeding risk. Less frequent but potentially life-threatening complications include Mallory-Weiss tears, esophageal rupture, hepatic dysfunction, pneumothorax, retinal hemorrhage, splenic injury, and placental complications such as abruption or hemorrhage [2]. Beyond physical complications, hyperemesis gravidarum is associated with significant psychological morbidity, including depression, posttraumatic stress disorder, and suicidal ideation. In extreme circumstances, the condition has contributed

to the termination of otherwise desired pregnancies. Associations have also been reported with fetal growth restriction, hypertensive disorders, and placental pathology, particularly in prolonged or severe cases [1].

Consultations

Women presenting with suspected or confirmed hyperemesis gravidarum should be referred promptly to obstetric clinicians due to the severity and potential complications of the condition. Inpatient management is indicated when outpatient therapy fails, dehydration or electrolyte disturbances are present, or intravenous therapy is required. Optimal care relies on an interprofessional approach involving obstetricians, nurses, dietitians, pharmacists, and mental health professionals. This collaborative model improves symptom control, reduces complications, and enhances maternal and fetal outcomes [2][3][1].

Patient Education

Patient education is central to effective management and complication prevention in hyperemesis gravidarum. Patients should be informed about early warning signs, the importance of hydration and nutrition, and clear thresholds for seeking medical care. Education regarding available treatments, including pharmacologic therapy and nutritional support, helps normalize care escalation when oral intake becomes inadequate [2]. Counseling should emphasize adherence to prescribed micronutrient supplementation, particularly thiamine, iron, and vitamin D, and address concerns about medication safety during pregnancy. Preventive strategies focus on early intervention, especially in individuals with prior severe symptoms. Preconception multivitamin use and early initiation of antiemetic therapy may reduce symptom severity in subsequent pregnancies. Dietary modifications and nonpharmacologic measures such as ginger supplementation may provide additional benefit when implemented early [2][1].

Enhancing Healthcare Team Outcomes

Effective management of hyperemesis gravidarum depends on coordinated interprofessional collaboration. Physicians and advanced practitioners guide diagnosis, treatment escalation, and decisions regarding hospitalization or nutritional support. Nurses play a critical role in continuous assessment, medication administration, patient education, and early detection of complications. Pharmacists ensure medication safety, optimize dosing, and monitor interactions, while dietitians individualize nutritional strategies to prevent malnutrition and micronutrient deficiency. Consistent communication, shared documentation, and aligned treatment goals are essential to prevent fragmented care. When healthcare professionals function as an integrated team, they address both the physical and psychological dimensions of hyperemesis gravidarum, resulting in safer care, improved patient satisfaction, and better maternal and fetal outcomes [1][2][3].

Conclusion:

Hyperemesis gravidarum remains a significant clinical challenge in obstetric practice due to its complex etiology, variable severity, and potential for serious maternal and fetal complications. Although its prognosis is generally favorable with timely intervention, untreated or inadequately managed cases can result in metabolic imbalance, nutrient deficiencies, psychological distress, and impaired quality of life. The multifactorial nature of HG underscores the importance of individualized assessment, incorporating hormonal, genetic, physiological, and psychosocial factors. Early diagnosis is essential, relying on careful clinical evaluation, targeted laboratory testing, and exclusion of alternative conditions. Effective management requires a structured, stepwise approach beginning with lifestyle and dietary modifications, progressing to pharmacologic therapy tailored to symptom severity, and advancing to enteral or parenteral nutritional support when oral intake remains insufficient. Psychological support plays a vital role, as many patients experience anxiety, depression, or traumatic stress related to prolonged illness. Multidisciplinary collaboration among obstetricians, nurses, pharmacists, dietitians, and mental health professionals ensures comprehensive care and minimizes risks. Ultimately, improving outcomes relies on early recognition, proactive intervention, patient education, and coordinated follow-up. Continued research is needed to refine diagnostic criteria, clarify pathophysiological mechanisms, and develop more targeted therapies to support maternal well-being and optimal pregnancy outcomes.

References:

1. Clark SM, Zhang X, Goncharov DA. Inpatient Management of Hyperemesis Gravidarum. Obstet Gynecol. 2024 Jun 01;143(6):745-758.
2. Committee on Practice Bulletins-Obstetrics. ACOG Practice Bulletin No. 189: Nausea And Vomiting Of Pregnancy. Obstet Gynecol. 2018 Jan;131(1):e15-e30.
3. Elkins JR, Oxentenko AS, Nguyen LAB. Hyperemesis Gravidarum and Nutritional Support. Am J Gastroenterol. 2022 Oct 01;117(10S):2-9.
4. Lacasse A, Rey E, Ferreira E, Morin C, Bérard A. Nausea and vomiting of pregnancy: what about quality of life? BJOG. 2008 Nov;115(12):1484-93.
5. Liu C, Zhao G, Qiao D, Wang L, He Y, Zhao M, Fan Y, Jiang E. Emerging Progress in Nausea and Vomiting of Pregnancy and Hyperemesis Gravidarum: Challenges and Opportunities. Front Med (Lausanne). 2021;8:809270.

6. Geeganage G, Iturrino J, Shainker SA, Ballou S, Rangan V, Nee J. Emergency department burden of hyperemesis gravidarum in the United States from 2006 to 2014. AJOG Glob Rep. 2023 Feb;3(1):100166.
7. Gadsby R, Barnie-Adshead AM, Jagger C. A prospective study of nausea and vomiting during pregnancy. Br J Gen Pract. 1993 Jun;43(371):245-8.
8. Di Iorio R, Bianchi P, Casolati E, Piccolo E, Mangrella M. Assessing the approaches to nausea and vomiting in pregnancy: insights from a nationwide survey of Italian gynecologists (PURITY light). Front Med (Lausanne). 2025;12:1462860.
9. Nijsten K, van der Minnen L, Wiegers HMG, Koot MH, Middeldorp S, Roseboom TJ, Grooten IJ, Painter RC. Hyperemesis gravidarum and vitamin K deficiency: a systematic review. Br J Nutr. 2022 Jul 14;128(1):30-42.
10. Lowe SA, Steinweg KE. Review article: Management of hyperemesis gravidarum and nausea and vomiting in pregnancy. Emerg Med Australas. 2022 Feb;34(1):9-15.
11. Vinnars MT, Forslund M, Claesson IM, Hedman A, Peira N, Olofsson H, Wernersson E, Ulfsdottir H. Treatments for hyperemesis gravidarum: A systematic review. Acta Obstet Gynecol Scand. 2024 Jan;103(1):13-29.
12. Viljoen E, Visser J, Koen N, Musekiwa A. A systematic review and meta-analysis of the effect and safety of ginger in the treatment of pregnancy-associated nausea and vomiting. Nutr J. 2014 Mar 19;13:20.
13. Werntoft E, Dykes AK. Effect of acupressure on nausea and vomiting during pregnancy. A randomized, placebo-controlled, pilot study. J Reprod Med. 2001 Sep;46(9):835-9.
14. Challacombe FL, Bickers E, Gilderthorp R, Buabeng R, Hallett C. Understanding the support needs of women with hyperemesis gravidarum. Midwifery. 2025 Aug;147:104438.
15. Lacasse A, Rey E, Ferreira E, Morin C, Bérard A. Validity of a modified Pregnancy-Unique Quantification of Emesis and Nausea (PUQE) scoring index to assess severity of nausea and vomiting of pregnancy. Am J Obstet Gynecol. 2008 Jan;198(1):71.e1-7.

Nijsten K, Jansen LAW, Limpens J, Finken MJJ, Koot MH, Grooten IJ, Roseboom TJ, Painter RC. Long-term health outcomes of children born to mothers with hyperemesis gravidarum: a systematic review and meta-analysis. Am J Obstet Gynecol. 2022 Sep;227(3):414-429.e17.