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Understanding Hyperemesis Gravidarum, Urinary Tract Infection, and Total Placenta Previa: Threats in Early Pregnancy

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Keyword:
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Abstract
Introduction: *Hyperemesis gravidarum is a condition of excessive vomiting during pregnancy, occurring before 20 weeks of gestation. Urinary tract infections (UTIs) involve infections affecting any part of the urinary tract, and pregnant patients are more susceptible to UTIs. Placenta previa is a condition where the placenta partially or completely covers the internal cervical os. These three conditions have significant impacts on maternal and fetal well-being, necessitating a thorough understanding of their pathophysiology, diagnosis, and appropriate management.* ***Objective:*** *To report a case of hyperemesis gravidarum, urinary tract infection, and total placenta previa in a 30-year-old female patient.* ***Case Report:*** *A 30-year-old G2P1A0 woman presented with complaints of vomiting more than 8 times per day and brownish spotting, later diagnosed with hyperemesis gravidarum, UTI, and total placenta previa.* ***Result and Discission:*** *Findings included ketonuria, bacteriuria, bleeding from a closed external cervical os, and ultrasound imaging showing the placenta covering the internal cervical os.* ***Conclusion:*** *The patient was hospitalized and received appropriate medical management.*

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Introduction

Hyperemesis gravidarum (HEG) is a condition of excessive vomiting during pregnancy, which occurs before 20 weeks of gestation, with or without metabolic disorders such as dehydration, electrolyte imbalance, and depletion of carbohydrate reserves. This condition can continue until the end of pregnancy until it becomes a maternal complication that disrupts the mother's daily physical activities. HEG is the most severe form of nausea and vomiting in pregnancy, often requiring hospitalization and intensive care. Clinical manifestations of HEG include weight loss of more than 5%, ketonuria, dehydration, and electrolyte imbalance. In general, excessive vomiting is defined as vomiting that occurs more than three times a day (Simanjuntak & Andrian, 2019). Urinary tract infection (UTI) is a broad term that includes infections that affect any part of the urinary tract (bladder, urethra, kidneys). Women are more susceptible to UTIs than men, mainly because of the anatomy of the lower urinary tract and its proximity to the reproductive organs. During pregnancy, several anatomical and physiological changes occur in the urinary tract that make pregnant patients more susceptible to UTIs. Progesterone-induced ureteral dilation, combined with mechanical compression of the ureters by the enlarging uterus, leads to increased residual bladder volume and urinary stasis, resulting in vesicoureteral reflux. Consequently, these changes increase the risk of bacterial colonization and ascending infection (Graseck et al., 2023)

Placenta previa is a condition where the placenta covers part or all of the internal os of the cervix. Placenta previa is classified into marginal, partial, and totalis. Marginal placenta previa is a condition where the edge of the placenta is <2 cm from the internal os of the cervix. As for low-lying placenta, which is a condition where the edge of the placenta is within 2 to 3.5 cm from the internal os of the cervix (Anderson-Bagga FM & Sze A, 2023). If detected in the first trimester, the placenta can still shift upwards along with the growth of the uterus. Risk factors for placenta previa include multiparity, age over 35 years, smoking, drug use, history of cesarean section or curettage (Jain et al., 2020).

Method

Type of Research: This research is a descriptive study with a case study approach, which aims to report the clinical management of a pregnant patient with three simultaneous complications: hyperemesis gravidarum, UTI, and placenta previa totalis. Research Subjects is A 30-year-old female patient, G2P1A0, pregnant at around 14 weeks of gestation, came with complaints of vomiting >8 times/day and vaginal spotting. The location and Time of the Research were conducted at the UKI Hospital Emergency Room in February 2025. Clinical Procedures**:** 1) Physical examination: vital signs, obstetric status, vaginal examination; 2) Supporting examinations: urinalysis (ketonuria, leukocytes, bacteria), transabdominal and transvaginal ultrasonography**;** 3) Diagnostics: diagnosis is based on clinical and laboratory criteria**;** 4) Therapy: IV fluids, antiemetics (ondansetron/metoclopramide), category B antibiotics, bed rest**.** Ethics and Consent**:** the patient has given informed consent for her case data to be used in scientific publications without mentioning personal identities. Data were analyzed narratively and descriptively, referring to guidelines and related scientific literature.

Result and Discussion

1. Result

A 30-year-old G2P1A0 woman, 12 weeks pregnant, came to the UKI Hospital Emergency Department with complaints of continuous vomiting since 3 days before admission. The patient said that on the day she entered the Emergency Department she vomited > 8 times, approximately ½ a 200 ml glass, without blood. Initially, the vomit contained food, then subsequent vomit was liquid. The patient also said that every time she vomited, a little brownish spot came out of the birth canal without any clots. The patient also complained of headaches and heartburn that had come and gone since 3 days before admission.

Complaints of fever (-), shortness of breath (-), history of trauma (-). The patient's appetite decreased. The patient also said that she had not had a bowel movement since 3 days before the hospital. There were no complaints of urination. CU: Appears moderately ill, Consciousness: Compos mentis, Blood pressure: 119/93 mmHg, Pulse: 94x/minute, Respiratory rate: 20x/minute, Temperature: 36.7oC, SpO2: 99% in room air. Epigastric tenderness (+). Obstetric Examination Inspection: nipple retraction -/-, mass -/-, breast milk -/- the abdomen appears flat, striae gravidarum (-), linea nigra (+), cicatrix (+), fluor (-), fluxus (-), Palpation: TFU not palpable, abdominal circumference 88 cm, Auscultation: DJJ 150x/minute. Internal examination: fluoride (-), blood coming out of the vaginal canal, vaginal rugae (+), mass (-), portio size 2-3 cm, smooth surface, live color, vaginal canal closed, tissue (-). Laboratory examination Hb: 13.7 g/dL, Ht: 42%, L: 10.7 thousand/uL ↑, T: 384 thousand/uL, Na: 141 mmol/L, K: 3.5 mmol/L, Cl: 100 mmol/L, Urine color: cloudy yellow, BJ: 1,010, urine pH: 7.5, Blood: +2, Leukocyte esterase: +2, Nitrite: (+), Protein: +3, Bilirubin: (-), Acetone: (+3), Reduction: (-), Urobilinogen: >8.0, Leukocytes: 50-60/lpb, Erythrocytes: 20-30/lpb, Epithelium: +1, Bacteria: (+), Cylinders: (-), Crystals: (-). Last USG examination on 01/30/25 DJJ: (+), CRL: 2.38 cm, TP: September 3, 2025, Placenta: OUI, Impression: Placenta Previa Totalis.

The patient has no history of hypertension, diabetes mellitus, heart disease, asthma, and allergies. The patient first menstruated when she was 12 years old, regular cycles every month, menstruation lasts 5-7 days, changes pads 2-3 times. HPHT: November 27, 2024. Married once and has lasted for 4 years. The patient gave birth to her first child by caesarean section in 2021. The patient has a history of using IUD contraception in 2022-2024. The diagnosis is G2P1A0 pregnant 12 weeks BSC 1x with HEG grade 2, UTI, and placenta previa totalis. Management is given IVFD RL 500 ml 20 tpm, inj. Ondansetron 2x8 mg, Ceftriaxone 1x2 grams IV, Primperan 1x1 mg IV, Ranitidine 1x50 mg IV, Antacid syr 3x1 C PO, Vitamin B complex 3x1 PO. The first day of treatment evaluation was carried out on February 19, 2025 at 06.30, the results showed that the patient was still complaining of nausea (+), vomiting (-), spotting (-), headache and heartburn decreased, had not had a bowel movement since 4 days of SMRS, had not urinated since last night at 19.00 even though he had drunk a lot of water around 800 ml. Consciousness: compos mentis, Blood pressure: 105/67 mmHg, Pulse: 75x/minute, Respiratory rate: 20x/minute, Temperature: 36.7ºC, SpO2: 100% in room air.

The second day of treatment evaluation was carried out on February 20, 2025 at 06.30, the results showed that the patient still felt nauseous (+), vomiting (-), discharge (+) from the birth canal as much as 1-2 drops of brownish color without lumps, still had not defecated since 5 days of SMRS, was able to urinate as usual without any complaints.

Consciousness: compos mentis, Blood pressure: 102/62 mmHg, Pulse: 66x/minute, Respiratory rate: 17x/minute, Temperature: 36.3ºC, SpO2: 99% in room air.

2. Discussion

After anamnesis, physical examination, and supporting examinations, the diagnosis can be established, namely G2P1A0 12 weeks pregnant + BSC 1x + Hyperemesis Gravidarum Grade 2 + UTI + Placenta Previa Totalis. The diagnosis of HEG grade 2 is established based on the high frequency of vomiting and the presence of ketonuria. The patient complained of vomiting more than 8 times in the last 3 days. The vomit initially contained food then became liquid only, approximately ½ a glass of 200 ml, without blood. This high frequency of vomiting indicates a significant level of severity. The patient reported decreased appetite, which can worsen nutritional conditions and dehydration. The patient also complained of heartburn which can be associated with gastric irritation due to excessive vomiting. The patient has not had a bowel movement (BAB) for the last 3 days, which may be caused by dehydration and decreased food intake. Urinalysis found acetone (+3), indicating ketonuria. Ketonuria is a sign that the body is using fat as an energy source due to lack of nutrition and dehydration (Hitzeman et al., 2022)

Hyperemesis gravidarum is caused by increased levels of pregnancy hormones, especially human chorionic gonadotropin (hCG) and estrogen, which stimulate the nausea and vomiting center in the brain. In some women, the body's response to these hormones is excessive, causing severe nausea and vomiting. Other risk factors that can worsen the condition include a history of HEG in a previous pregnancy, multiple pregnancies, or psychological conditions such as stress. In this patient's case, 12 weeks of gestation is the peak of hCG production, which may explain why the patient experienced severe symptom (Austin et al., 2019).

Although the patient did not report any complaints of urination and physical examination did not reveal any abnormalities, a urinalysis showed Leukocyte Esterase (+2): indicating the presence of white blood cells (leukocytes) in the urine, which is a sign of infection. Positive nitrite: indicating the presence of gram-negative bacteria, such as E. coli, which is a common cause of UTIs. Blood (+2): The presence of blood in the urine may indicate irritation or infection of the urinary tract. Positive bacteria: indicating the presence of bacteria in the urine, which confirms infection. Leukocytes 50-60/lpb: high leukocyte count in urine indicates inflammatory response to infection. Erythrocytes 20-30/lpb: presence of red blood cells in urine may be caused by irritation or infection (Kohlerschmidt et al., 2021)

UTIs are often caused by bacteria, especially E. coli, which enter the urinary tract through the urethra and multiply in the bladder. In pregnancy, anatomical and physiological changes in the urinary tract (such as an enlarged uterus pressing on the bladder) increase the risk of UTIs. Pregnancy hormones such as progesterone also cause relaxation of the muscles of the urinary tract, which can slow the flow of urine and facilitate bacterial growth. UTIs in pregnancy can be asymptomatic or symptomatic. Asymptomatic UTIs are often found incidentally through routine examinations, as in this patient's case (Fatima & Al Mussaed, 2017).

Meanwhile, the diagnosis of total placenta previa is obtained based on complaints of brownish spotting without clots, bleeding from the OUE (+) during speculum examination with the OUE closed and tissue (-), and confirmed by ultrasound examination. Placenta previa totalis is often detected in the first trimester or early second

trimester because the size of the uterus is still small, but in most cases, the placenta will move to a higher position as the uterus grows (this phenomenon is called placental migration) (Jansen et al., 2020). The patient had a history of cesarean section in 2021, which increases the risk of placenta previa because scar tissue in the uterus can affect implantation. The patient had complained of brownish spotting coming out of the vagina. Although this spotting is not always specific for placenta previa, it can be a sign of light bleeding that is often associated with this condition (Aplin et al., 2020).

In theory, placenta previa is often associated with bright red bleeding because the bleeding comes from torn blood vessels in the placental area that covers the cervix. However, in this case, the brownish blood color can occur for several reasons such as bleeding that occurs little or slowly, where the blood has more time to oxidize before leaving the body, or the blood that comes out of the placenta previa may not flow out directly through the vagina. If the blood is retained in the uterus or cervical canal for some time, the blood can oxidize, causing the color to turn brown (Cunningham et al., 2014)

The treatment given to this patient is IVFD RL 500 ml. Ringer Lactate (RL) is an isotonic fluid containing electrolytes (sodium, potassium, calcium, and lactate) that are similar to the composition of body fluids. This fluid is ideal for treating dehydration and electrolyte imbalance due to excessive vomiting in cases such as HEG (Hadipourzadeh et al., 2024).

The patient was also given Inj. Ondansetron 2x8 mg. Ondansetron is an effective antiemetic drug for treating excessive nausea and vomiting in HEG. The patient vomited more than 8 times in 3 days, indicating the severity of HEG Grade 2. HEG is caused by increased levels of pregnancy hormones (hCG and estrogen) that stimulate the nausea and vomiting center in the brain. Ondansetron works by blocking serotonin (5-HT3) receptors in the nausea and vomiting center, thereby reducing the frequency of vomiting and improving nutrient and fluid intake (Merecz et al., 2023); Committee on Practice Bulletins-Obstetrics, 2018)

Given Primperan 1x1 mg IV. Primperan (metoclopramide) is an antivomitus drug used to treat nausea and vomiting. Metoclopramide works by inhibiting dopamine receptors in the nausea and vomiting center and increasing gastrointestinal motility.7 In addition, the patient was given Vitamin B complex 3x1 PO. Vitamin B complex (including B1, B6, and B12) is important for carbohydrate, protein, and fat metabolism, as well as nervous system function. This patient experienced decreased appetite and excessive vomiting, which can lead to vitamin B deficiency. Vitamin B deficiency, especially B1 (thiamine), can cause complications such as Wernicke's encephalopathy in patients with excessive vomiting. Pyridoxine (vitamin B6) is one of the main treatments for HEG. Pyridoxine works by modulating neurotransmitters in the brain, reducing the activity of the nausea and vomiting center, and supporting the body's metabolism. In this case, pyridoxine is given to reduce symptoms of excessive nausea and vomiting, overcome nutritional deficiencies, and support maternal and fetal health. Pyridoxine is safe to use during pregnancy and is often combined with other antiemetic drugs to increase the effectiveness of treatment (Jayawardena et al., 2023)

To relieve the heartburn experienced by the patient, Ranitidine 1x50 mg IV and Antacid Syr 3x1 C PO were given. Ranitidine is an H2 receptor antagonist used to reduce stomach acid production. This increase in stomach acid can occur due to excessive vomiting and physical stress. Antacids contain compounds such as magnesium hydroxide or aluminum hydroxide, which can neutralize stomach acid and coat the stomach wall. This drug provides a quick effect to relieve symptoms of heartburn (Altuwaijri, 2022)

The patient was then given Ceftriaxone 1x2 g IV. Ceftriaxone is a third-generation cephalosporin antibiotic that has a broad spectrum against gram-negative and gram-positive bacteria. This drug works by inhibiting bacterial cell wall synthesis, causing cell lysis and bacterial death. In this patient's case, ceftriaxone was given to treat UTIs which are generally caused by gram-negative bacteria, especially E. coli. The advantages of ceftriaxone, such as broad spectrum, stability against beta-lactamase, and safety for pregnant women, make it the right choice for managing UTIs during pregnancy (Sudharsan et al., 2024)

Conclusion

A 30-year-old female patient G2P1A0 with hyperemesis gravidarum, urinary tract infection, and placenta previa totally has been successfully managed conservatively and medically. Fast, precise, and coordinated interdisciplinary medical treatment is the main key to the success of this case. Education and close monitoring of high-risk pregnant patients are essential to prevent complications that endanger both the mother and the fetus.

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