Case Report

Severe Ovarian Hyperstimulation Syndrome Complicated by Suspected Sepsis: A Case Report

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Abstract

Introduction: Ovarian hyperstimulation syndrome (OHSS) is a serious complication of ovulation induction for infertility treatment. This case report discusses severe OHSS complicated by suspected sepsis. This report aims to remind healthcare professionals about the best management options for severe OHSS cases.

Case Report: Case report of severe OHSS with a normal 4-week 1-day gestation in a 26-year-old primigravida who presented in our emergency room as a result of 6 days of abdominal pain and an enlarged abdomen progressively aggravated for 5 days, with a SOFA score of 3. The patient's vital signs indicated shock. She was admitted to the ICU for 4 days. She has significant risk factors: a history of IVF and the development of polycystic ovary syndrome (PCOS). On ultrasound imaging, we found ascites and multiple follicles with no gestational sac. A diagnosis of severe ovarian hyperstimulation was made.

Conclusion: Severe and critical forms of OHSS are potentially lethal disorders. Although OHSS is potentially life-threatening, its clinical detection is often delayed. Proactive strategies should be encouraged and enhanced to avoid severe complications. Our case report reminds to understand the signs, symptoms, and management of severe OHSS.

Keywords: Case Report, in vitro fertilization, ovarian hyperstimulation, PCOS, septic shock

Penatalaksanaan Sindrom Hiperstimulasi Ovarium Berat dengan Syok Sepsis sebagai Komplikasi: Laporan Kasus

Abstrak

Pendahuluan: Sindrom hiperstimulasi ovarium (OHSS) merupakan komplikasi serius dari induksi ovulasi dalam pengobatan infertilitas. Laporan kasus ini membahas HSS berat yang diperberat dengan dugaan sepsis. Tujuan laporan ini untuk mengingatkan tenaga medis tentang pilihan penatalaksanaan terbaik pada kasus OHSS berat.

Laporan Kasus : Penelitian ini melaporkan sebuah kasus OHSS berat dengan kehamilan normal usia 4 minggu 1 hari pada seorang primigravida berusia 26 tahun yang datang ke unit gawat darurat dengan keluhan nyeri perut selama 6 hari, pembesaran perut yang semakin memburuk selama 5 hari, dan skor SOFA 3. Tanda vital pasien menunjukkan syok. Pasien dirawat di ICU selama 4 hari. Pasien memiliki faktor risiko yang signifikan, yaitu riwayat program bayi tabung (IVF) dan menderita sindrom ovarium polikistik (PCOS). Pada pemeriksaan ultrasonografi ditemukan asites dan folikel-folikel multipel tanpa kantung gestasi. Diagnosis sindrom hiperstimulasi ovarium berat pun ditegakkan.

Kesimpulan: OHSS berat dan kritis merupakan kondisi yang berpotensi mengancam jiwa, namun deteksi klinisnya sering terlambat. Strategi proaktif harus didorong dan ditingkatkan untuk menghindari komplikasi yang berat. Laporan kasus kami mengingatkan untuk memahami tanda, gejala, dan penatalaksanaan OHSS berat.

Kata Kunci: Fertilisasi in vitro; hiperstimulasi ovarium; laporan kasus; PCOS; syok septik

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Introduction

OHSS is a serious clinical complication that occurs as a result of controlled ovarian stimulation (COS), with an incidence of approximately 2% for the severe form.[1] COS aims to increase the number of oocytes in assisted reproductive cycles, but OHSS represents an excessive response to this procedure. Symptoms include ovarian enlargement, hypercoagulability, hemoconcentration, ascites, and electrolyte imbalances, as well as nausea, vomiting, diarrhea, abdominal distension, pain, and shortness of breath. In severe cases, it can lead to acute kidney failure, venous thromboembolism, and pleural effusion. OHSS is commonly associated with gonadotropin use in COS but may also occur spontaneously due to stimulation by gonadotropin-releasing hormone or clomiphene.[2-4]

OHSS is staged (mild, moderate, severe, or critical) by the severity of symptoms and laboratory findings.[1] It is of interest that the rate of infectious complications among patients with severe OHSS is relatively high (total infection rate >30%).[5] Only 0.61% of confirmed OHSS patients require ICU care due to the severity of their condition.[6] There have been only a few reports regarding patient follow-up after remission of clinical symptoms in severe OHSS, and this paper will discuss the case. This study aims to remind medical staff of the best choice of management in severe OHSS.

Case Report

A 26-year-old primigravida at 4 weeks and 1 day of gestation, with a history of PCOS and undergoing an in vitro fertilization (IVF) program, presented with abdominal pain affecting the entire abdominal region for the past six days. She also reported progressive abdominal distension. There was no vaginal bleeding observed. This was the patient's first pregnancy. The diagnosis of pregnancy is established based on a history of a positive hCG test. The patient denied any history of chronic illnesses such as hypertension, diabetes mellitus, asthma, heart disease, renal insufficiency, or allergies. Due to these symptoms, the patient sought medical attention at the hospital.

Anthropometric assessment showed that the patient was underweight with a BMI of 18.31 kg/m² (weight 44 kg and height 155 cm). The patient's vital signs indicated hypotension (88/54 mmHg), tachypnea (respiratory rate of 24 breaths per minute), bradycardia (heart rate of 42 bpm) with weak pulses, and fever (38.2°C). Neck examination revealed no elevation of jugular venous pressure (JVP). On thoracic examination, vesicular breath sounds were present bilaterally, with no rales or wheezing detected. Cardiac examination showed normal S1 and S2 heart sounds, with no murmurs or gallops. Minimal pitting edema was observed in both lower extremities.

The abdomen appears distended and soft on palpation, with tenderness (+), shifting dullness (+), and fluid wave (+). There were no uterine contractions, and the fundal height was not yet palpable. Blood laboratory tests are shown in Table 1. Abdominal ultrasound (USG) revealed ascites, multiple follicles, and no visible gestational sac. Based on history, physical examination, and supporting investigations, the diagnosis of OHSS was established.

Resuscitation was performed to manage the patient's shock, including administration of 0.9% NaCl infusion at 60 mL/hour and dobutamine at 2 mcg/kg/min. Post-resuscitation evaluation showed clinical improvement of the shock symptoms. To address the septic infection, intravenous ceftriaxone 1 g every 12 hours was administered. Hypoalbuminemia was managed with a 20% albumin transfusion

(1 vial), followed by oral albumin supplementation (VIP albumin, 3 times daily). To prevent venous thromboembolic events (VTE) due to the patient's hypercoagulable state associated with OHSS, fondaparinux sodium 2.5 mg was given intravenously every 24 hours. An abdominal paracentesis was performed to reduce abdominal tension and gain symptomatic relief, yielding approximately 210 mL of thick yellow ascitic fluid. The patient was subsequently transferred to the intensive care unit (ICU) for closer monitoring and advanced care. Symptomatic treatment and supportive supplements were also provided to ensure patient comfort and support the ongoing pregnancy.

Table 1 Laboratory Test

Items	Values
Pregnancy test	positive hCG
white blood cell count	19,600/mm³
D-dimer levels	721 ng/mL
Albumin	2.4 g/dL
Sodium	131.7 mEq/L
Kalium	3.99 mmol/L
Chloride	98.9 mmol/L
Hb	13.2 g/dL
Ht	37.8%
Thrombocyte	298.000/mm³
LED	12 mm/hour
Ureum	21.1 mg/dL
Creatinine	0.72 mg/dL
SGOT	14.5 U/L
SGPT	9 U/L

Discussion

This case report describes the successful management of a critically ill patient with severe early-onset OHSS presenting with hemodynamic instability. As OHSS lacks specific symptoms or diagnostic tests, distinguishing it from other conditions can be challenging.[7] The patient's presentation, such as massive ascites, ovarian enlargement, hemoconcentration, and hypoalbuminemia, met criteria for severe OHSS, supported by her PCOS and recent IVF treatment. Differential diagnoses such as ectopic pregnancy, appendicitis, and ovarian torsion were excluded. Management focused on

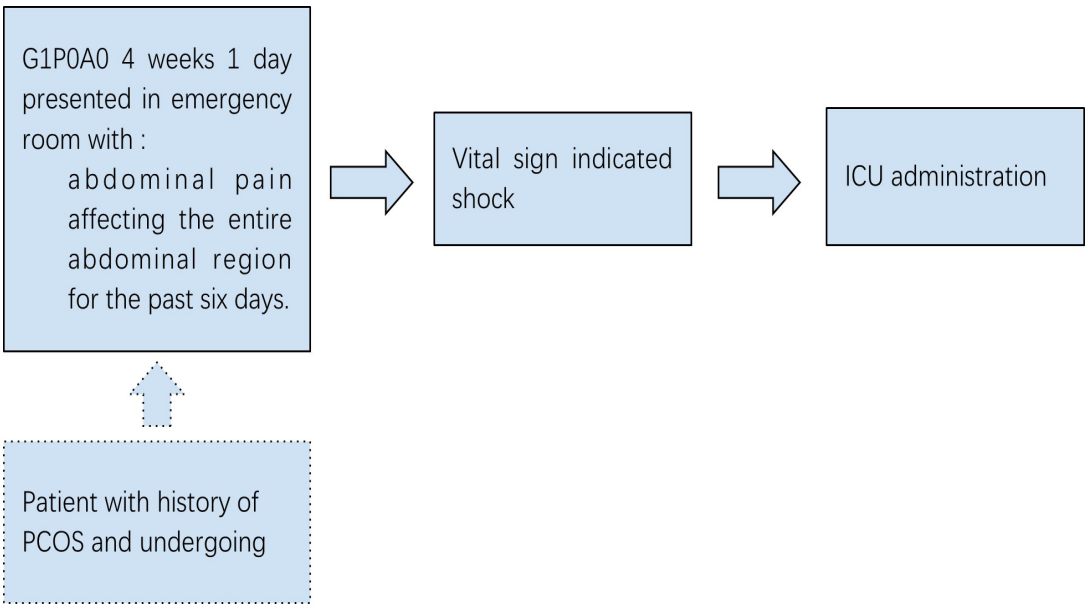


Figure 1 Timeline of Events

supportive care, fluid balance, and preventing complications, the key principles in treating this iatrogenic condition.[8] No previous reports were found of OHSS complicated by suspected septic shock.

The pathophysiology of OHSS involves an excessive ovarian response to gonadotropin stimulation, causing overproduction of VEGF (vascular endothelial growth factor), which markedly increases vascular permeability.[9] This results in a large shift of protein-rich fluid into the third space, leading to severe ascites, hemoconcentration, and dilutional hyponatremia. The resulting hypoalbuminemia (2.4 g/dL) further decreases plasma oncotic pressure, worsening fluid leakage and perpetuating a vicious cycle.

Patients with PCOS are at the highest risk for developing OHSS due to their high antral follicle count and heightened response to gonadotropins, leading to excessive follicle development and elevated VEGF levels.[10] OHSS, most often linked to gonadotropin use and less commonly clomiphene, is more severe and prolonged when pregnancy occurs because hCG sustains luteinization.[11] The condition results from increased capillary permeability, likely mediated by VEGF, cytokines (IL-2, IL-6, IL-8, TNF-α), and the ovarian renin-angiotensin system.[12-14] This highlights the need for careful monitoring and preventive measures, such as GnRH agonist triggers or lower stimulation doses, in PCOS patients.

The management of hemodynamic shock in severe OHSS is a delicate balancing act. The patient presented with hypotension and bradycardia, indicating significant intravascular volume depletion. While aggressive fluid resuscitation is the standard for many shock states, in OHSS, it can paradoxically worsen ascites and pulmonary edema due to the leaky capillaries. Therefore, the approach of cautious crystalloid infusion (0.9% NaCl at 60 mL/hour) combined with inotropic support (dobutamine) was appropriate. This strategy aims to support organ perfusion without further overloading the third space, a principle supported by modern management guidelines (Royal College of Obstetricians and Gynaecologists).[7]

One of the most life-threatening complications of severe OHSS is venous thromboembolism (VTE), a risk compounded by pregnancy and immobility. The patient's elevated D-dimer level (721 ng/mL) reflected a hypercoagulable state. The initiation of prophylactic anticoagulation with fondaparinux is consistent with current best practices. Guidelines from major societies strongly recommend VTE prophylaxis for all patients hospitalized with severe OHSS, as the risk of thrombosis can be as high as 10% without it.[8] This intervention was a critical step in preventing a potentially fatal pulmonary embolism in this high-risk patient.

Management of the patient's massive ascites and profound hypoalbuminemia was crucial. Therapeutic paracentesis, though yielding modest fluid, effectively relieved abdominal distension and improved respiration. Large-volume paracentesis is recommended for symptomatic tense ascites, while 20% albumin administration helps restore oncotic pressure, promote fluid reabsorption, and support renal perfusion. Although its routine use remains debated, it is indicated in severe hypoalbuminemia with hemodynamic instability, as in this case.[9]

The presence of significant leukocytosis (19,600/μL), fever (38.2°C), tachypnea, and a SOFA score of 4 raised the suspicion of a superimposed septic process, which is a valid concern in a critically ill patient.[15] However, it is well-established that OHSS itself is a systemic inflammatory response syndrome, and fever and leukocytosis can be manifestations of the underlying condition without an active infection.[10] There is still a limitation in this case, as no culture data are available; therefore, the diagnosis of sepsis

remains a clinical suspicion. Despite this, the decision to administer broad-spectrum antibiotics (ceftriaxone) was a prudent clinical judgment, as it is impossible to definitively rule out infection in the acute setting, and the consequences of untreated sepsis would be catastrophic.

Although rare, OHSS can be complicated by sepsis, often due to spontaneous bacterial peritonitis (SBP) developing in ascitic fluid.[16] Based on the literature review conducted by the authors, only a few such cases have been reported in the literature.[17] A study noted that while ascitic fluid in OHSS generally contains high protein levels, which should offer some protection against infection, severe cases may present with hypogammaglobulinemia, an immunocompromised state, that increases the risk of serious infections such as SBP.[18] Increased capillary permeability and fluid shifts create a favorable environment for bacterial growth and can lead to hypovolemia and organ dysfunction.[17,18] Our patient meets sepsis criteria and presents with hypotension, consistent with septic shock.[15]

There are several limitations in this case, including the absence of data on OHSS resolution, lack of information regarding fetal development, unavailability of detailed history about the patient's IVF program, and absence of culture data.

Conclusion

Severe and critical forms of OHSS are potentially lethal disorders. Although OHSS is potentially life-threatening, its clinical detection is often delayed. Proactive strategies should be encouraged and enhanced to avoid severe complications. Our case report reminds us to understand the signs, symptoms, and management of severe OHSS. The main lesson learned from this case is the importance of comprehensive documentation and close monitoring in early pregnancy OHSS.

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