Ovarian hyperstimulation syndrome (OHSS) is an iatrogenic complication that is associated with modern techniques for in vitro fertilization (IVF). The syndrome typically is associated with regimens of exogenous gonadotrophins but also can be seen, albeit rarely, during administration of clomiphene citrate for ovulation induction or spontaneously during pregnancy. OHSS can be critically ill and require aggressive medical intervention. This clinical situation is emotionally difficult because patients are often pregnant at the time of their acute illness.

- **Fluid leakage into the interstitium manifests clinically as ascites, pleural or pericardial effusions, electrolyte imbalances, oliguria, hemococoncentration, or hypovolemia with or without hypovolemic shock.**

- **Physical examination of patients with OHSS may reveal weight gain, increased abdominal girth, oliguria or anuria, and signs of hypovolemia. The ovaries are enlarged greatly and are easily palpable in the abdomen.**

- **In severe cases, respiratory compromise or multiorgan failure can be seen, as can the sequelae of thromboembolic events.**

- **In patients with moderate or severe OHSS, the pelvic examination must be avoided to decrease the likelihood of ovarian cyst rupture that may result in intraperitoneal hemorrhage.**

- **Respiratory distress in patients with OHSS most likely results from lung restriction caused by ascites, large cystic ovaries, or pleural or pericardial effusions.**

- **Pulmonary manifestations of severe OHSS include acute respiratory distress syndrome (ARDS), pulmonary embolism, pulmonary edema, atelectasis, and intra-alveolar hemorrhage.**

- **General features include decreased urine output, reduced peripheral vascular resistance, and intense stimulation of the renin-angiotensin and sympathetic nervous systems and antidiuretic hormone.**

- **OHSS can be accompanied by thromboembolic disease with both venous and arterial thrombosis seen.**

- **Central retinal artery occlusion with irreversible visual impairment has been described.**

- **Laboratory data are characterized by electrolyte abnormalities, including hyperkalemia and dilutional hyponatremia.**

- **Hemococoncentration is frequently seen, and a hematocrit greater than 55% heralds a life-threatening situation.**

- **In severe and life-threatening OHSS, an elevated serum creatinine level can be seen; however, in most cases of OHSS, the creatinine levels are within normal limits.**

- **Abnormalities of liver function tests are seen in approximately 30% of patients with severe OHSS and are characterized by mild-to-moderate increases in transaminases, which are associated in some cases with increases in levels of GGT or ALP.**

- **Hypalbuminemia commonly is seen.**

- **Serum IgG in patients with severe OHSS exudes into their peritoneal cavity, making them immunodeficient and at potential increased risk for infection.**

- **There is no specific treatment for OHSS, and therapy is mainly supportive until the condition resolves.**

- **The syndrome is self-limiting, and resolution parallels the decline in serum hCG levels (about 7 days in nonpregnant patients and 10-20 days in pregnant patients).**

- **Medical treatment of severe OHSS should be directed to maintain circulatory function and to mobilize the intra-abdominal fluid by creating a net negative balance of sodium and water. Initially, the goal is to replace fluids in the vascular compartment sufficient to allow adequate urine production.**

- **Echocardiography should be performed to exclude pericardial effusion.**

- **Administration of prophylactic anticoagulation should be part of routine care.**

- **A low threshold to start empiric antibiotic therapy is suggested when the possibility of an infectious process is considered in patients who are critically ill and hemodynamically unstable.**

- **Empiric antibiotic therapy should be directed at the most likely pathogens involved in this type of infections, which are P mirabilis, K pneumoniae, P aeruginosa, E coli, and P vulgaris.**

- **The role of immunoglobulins is uncertain.**

- **Nonsteroidal anti-inflammatory drugs (specifically indomethacin), antihistaminics, and ACE inhibitors have been mentioned in the medical literature as potential alternative therapeutic regimens for OHSS; however, most of the information regarding these drugs comes from animal studies or small, uncontrolled studies.**

- **In rare circumstances in which the syndrome increases in severity despite all interventions, termination of the pregnancy should be considered to decrease hCG levels.**

**Risk factors associated with OHSS**

- **High risk**
  - Young (<35 years)
  - PCOS-like
  - Aneurism
  - High serum estradiol
  - Multiple follicles
  - Neckline sign
  - Pregnancy
  - HCG luteal supplementation
  - GnRH-agonist protocol

- **Low risk**
  - Older (>36 years)
  - Hypogonadotropic
  - Heavy build
  - Low serum estradiol
  - Few follicles
  - Quiescent ovary
  - Barrel cyete
  - Progestrone or no supplementation
  - Clomiphene citrate and/or HMG protocol

**Criteria that define the severe and life-threatening stages of OHSS**

- **Severe OHSS**
  - Variably enlarged ovary
  - Massive ascites with or without hydrothorax
  - Hemococoncentration >45%
  - WBC count >15,000
  - Oliguria
  - Creatinine level 1.5-2.5 mg/dL
  - Creatinine clearance ≤50 mL/min
  - Liver dysfunction
  - Anasarca

- **Life-threatening OHSS**
  - Variably enlarged ovary
  - Tense ascites with or without hydrothorax
  - Hemococoncentration >55%
  - WBC count >25,000
  - Oliguria
  - Creatinine level ≥2.6 mg/dL
  - Creatinine clearance <50 mL/min
  - Renal failure
  - Thromboembolic phenomena
  - ARDS

**Epidemiology & risk factors**

**Classification of severity**

**Clinical features**

**Pathogenesis**

**General**

**Therapy**