Case Report

Ovarian hyperstimulation syndrome

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Sneha’s medical interests lie with general adult and paediatric medicine. In her spare time, Sneha enjoys sight-seeing and travelling.

This case report describes a lady who presented with abdominal pain, hypotension and multiple ovarian follicles following egg collection and embryo transfer. She was provisionally diagnosed with Ovarian Hyperstimulation Syndrome (OHSS) and managed accordingly. This case study describes her clinical presentation, investigations, progress, management and outcome. No current laboratory diagnostic/prognostic markers are available for OHSS; the condition is currently diagnosed clinically. The subsequent discussion elaborates on the epidemiology, pathophysiology, clinical features, assessment, management and risk factors of OHSS, and aims to increase awareness of this important complication of infertility treatment to assist diagnosis, prevention and early institution of treatment.

Case Introduction

Mrs. SR is a 39 year-old G7P1M5E1 female who underwent egg collection and embryo transfer. Ten days following egg collection and six days following embryo transfer, she developed fever, abdominal pain, nausea and vomiting. She was initially managed in a private hospital with fluids and analgesia but remained febrile. Abdominal imaging demonstrated ascites and multiple enlarged ovarian follicles. Mrs. SR was transferred to a public hospital for further management under a provisional diagnosis of OHSS.

On initial assessment, she was noted to be tachycardic, hypotensive and febrile. Her oxygen saturation was 100% on supplemental oxygen. She was oliguric, cold and clammy. Her respiratory examination revealed bibasal crepitations and there was rebound tenderness of the abdomen. The remainder of the examination revealed no further abnormalities.

Background and medical history

Mrs. SR was investigated for infertility in 2006 with no cause identified. Her background history included four previous in vitro fertilisation (IVF) attempts, resulting in early trimester miscarriages and an ectopic pregnancy. Dilatation and curettage following twin pregnancy miscarriage in 2005 had revealed normal fetal tissue. In 2007, she successfully underwent IVF with an uneventful pregnancy and normal vaginal birth.

Mrs. SR's menarche was at age thirteen and her menses were since irregular. There was no history of polycystic ovarian syndrome (PCOS), sexually transmitted infections, vaginal discharge or pelvic inflammatory disease. She had a history of depression, obesity and asthma but was on no regular medications for these conditions. Her IVF medications included a GNRH-agonist, recombinant-FSH, hCG, and progesterone. She was allergic to penicillin and trimethoprim.

There was no significant family history reported by Mrs. SR. She consumed minimal alcohol and was a non-smoker.

Physical examination

On admission, Mrs. SR appeared unwell. She was dyspnoeic and unable to talk in full sentences. Her vital signs on admission are shown below in Table 1.

Mrs. SR was oliguric, cold and clammy, with no other signs of dehydration. She had abdominal rebound tenderness and voluntary guarding. There were no palpable abdominal masses or hernias.


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Table 1. Mrs. SR’s vital signs on admission.

<table>
<thead>
<tr>
<th>Vitals on admission</th>
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<tbody>
<tr>
<td>Heart rate</td>
<td>128</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>90/60</td>
</tr>
<tr>
<td>Temperature</td>
<td>37.8 degrees Celsius</td>
</tr>
<tr>
<td>Oxygen saturation</td>
<td>100% on 5L/min oxygen</td>
</tr>
<tr>
<td>BMI</td>
<td>38.6</td>
</tr>
</tbody>
</table>

Her inspiratory effort was poor and there were bib basal crepitations. Cardiovascular examination was unremarkable.

Resuscitation/Initial Treatment

- Six litres normal saline
- IV ceftriaxone and metronidazole
- Supplemental oxygen (5L/min)

Diagnosis

A provisional diagnosis of OHSS was made. Differential diagnoses included ectopic pregnancy, bowel damage during egg-collection/implantation, unrelated bowel pathology (such as appendicitis/diverticulitis), ovarian torsion, ruptured ovarian cyst and drug fever.

Results of initial investigations are provided in Table 2.

Table 2. Results of Mrs. SR’s initial investigations.

<table>
<thead>
<tr>
<th>Investigations</th>
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<tbody>
<tr>
<td>b-HCG</td>
<td>&lt;5</td>
</tr>
<tr>
<td>Bedside echocardiography</td>
<td>No pericardial fluid</td>
</tr>
<tr>
<td>Blood culture</td>
<td>Gram positive cocci</td>
</tr>
<tr>
<td>Urine culture</td>
<td>Candida</td>
</tr>
<tr>
<td>CXR</td>
<td>Bibatal crepitations</td>
</tr>
<tr>
<td></td>
<td>No obvious signs of pulmonary embolus or pleural effusion</td>
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</tbody>
</table>
Outcome
Gynaecological and surgical teams reviewed Mrs. SR and agreed with the provisional diagnosis of OHSS. Due to her poor clinical status (respiratory symptoms and third space losses), Mrs. SR was intubated and managed supportively in ICU for nine days. Her symptoms gradually resolved and her blood results normalised during this time. She was transferred to the rehabilitation ward to facilitate her ongoing recovery and returned home five and a half weeks after her initial presentation.

This case demonstrates one of the more significant complications following egg harvest. A detailed discussion of OHSS, its pathophysiology, epidemiology, clinical symptoms and management follows.

Ovarian Hyperstimulation Syndrome

Incidence
The incidence of OHSS reported in different studies varies depending on the classification system used. A classification of severity and associated clinical features is given below in Table 3.

Globally, OHSS affects 100-200 women per 100,000 cycles annually (prevalence is 0.5-5% for severe forms). In Australia, 30% of the women undergoing IVF develop OHSS and 0.5-2% require hospitalisation. [1,2]

As demonstrated from Table 4, although the incidence of severe-OHSS (respiratory symptoms and third space losses), Mrs. SR was intubated and managed supportively in ICU for nine days. Her symptoms gradually resolved and her blood results normalised during this time. She was transferred to the rehabilitation ward to facilitate her ongoing recovery and returned home five and a half weeks after her initial presentation. A detailed discussion of OHSS, its pathophysiology, epidemiology, clinical symptoms and management follows.

Pathophysiology
OHSS is an iatrogenic complication of pharmacological ovarian stimulation. Its pathophysiology is not completely understood. It usually occurs a several days after follicular rupture following hCG administration, which promotes the release of vasoactive substances (histamine, serotonin, pro lactin, interleukins, TNF-alpha, VEGF and so on) that affect the endothelial adherens junctions and result in trans-endothelial permeability. Consequently, there is third space loss (leading to shock, oliguria/anuria and/or electrolyte imbalances), haemoconcentration and an increased risk of clot formation. The overactive adhesion molecules and ovarian inflammatory response further promote OHSS by affecting folliculogenesis, ovulation, corpus luteum formation and luteolysis. These collectively result in the clinical features observed in OHSS. Strong links have been observed between hCG and the development of OHSS. In fact, more than one dose of hCG and progression to pregnancy following induction are risk factors for OHSS in patients receiving IVF treatment. [3,4,6-8]

Risk factors
Risk factors include oligomenorrhea, young age, low body mass index (BMI), PCOS, high dose exogenous, gonadotropins, high oestradiol (E2), clomiphine citrate and IVF. [1,4,7,8]

Clinical features
Patients generally develop symptoms four to five days after egg harvest. Initial symptoms of mild disease may include nausea and abdominal distension or discomfort. Disease progression is generally marked by the persistence of symptoms and the development of vomiting, weight gain, ascites, pleural effusion, hypoalbuminaemia and other symptoms described under the pathophysiology section. Complications of OHSS may manifest as thromboembolism, acute renal failure, respiratory compromise, hyperkalaemia and infection. These are further detailed in Table 3. [3-6]

Clinical assessment of patients with probable OHSS should include a complete history and examination. Work up should include basic haematological testing (including full blood count, urea/electrolytes/creatinine, liver function tests, beta-hCG and coagulation studies),
significant role decreasing morbidity. [2-5,7,8]

There is some controversy regarding fluid administration in OHSS. Currently, crystalloids and colloids are thought to be similarly effective in increasing intravascular volume. While paracentesis is used for symptomatic relief, and has been found to relieve respiratory symptoms in the acute setting, there is no data on its long term efficacy in symptom control. [4,5,7,8]

Conclusion

OHSS is a rare but potentially fatal complication of infertility treatment. Hence, it is extremely important to ensure continuing awareness of its causes, clinical manifestations, treatment, prevention and epidemiology. This will ensure early recognition and management of the condition and reduce morbidity and mortality.

Consent

Informed consent was obtained from the patient for publication of this case report and accompanying figures.

Conflicts of Interest

None declared.

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References