South Australian Paediatric Clinical Guidelines

# Ovarian hyperstimulation syndrome (OHSS)



**This guideline has been developed to assist in the assessment and management of women with ovarian hyperstimulation syndrome (OHSS).**

## Definition

- OHSS occurs after an excessive number of follicles develop in response to follicle stimulating hormone (FSH) administration (FSH-Puregon, Gonal-F) followed by HCG administration to trigger the release of oocytes. This is usually undertaken during infertility treatment

## Pathophysiology

- Multiple follicles (>15) develop in response to FSH stimulation. When HCG is given very high levels of vascular endothelial growth factor (VEGF) are produced by the ovaries. VEGF induces vascularisation of the multiple corpora lutea but also increases blood vessel permeability. There is transudation, or leakage, of fluid from the vasculature resulting in ascites, oedema and pleural effusions. There is also a reduction in the circulating vascular volume leading to haemoconcentration, reduced renal perfusion and oliguria (decreased urine output)

## Aetiology

Usually a complication of infertility treatment

### Risk factors include

- Polycystic Ovarian Syndrome (PCOS)
- Large number of oocytes collected (>15)
- Young age
- Low body mass index (BMI)
- High treatment doses of FSH
- Rapidly rising / high oestrogen levels (>15)
- Increased ovarian volume and preantral follicles on baseline scan
- Elevated baseline measurements of anti-mullerian hormone (AMH)
- Hypogonadotrophic hypogonadism

## Clinical presentation

Women may present

- Early – 3-7 days after HCG injection
- Late – 12-17 days after HCG injection (usually associated with a positive pregnancy test)

### Clinical features include

- Lower abdominal pain and bloating
- Nausea, vomiting and diarrhoea
- Shortness of breath, decreased exercise tolerance
- Vulval and peripheral oedema, ascites and pleural effusions

### Complications of OHSS include

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# Ovarian hyperstimulation syndrome (OHSS)



- Deep venous thrombosis (DVT)
- Pulmonary embolism (PE)
- Arterial thrombosis
- Carotid vein thrombosis and stroke
- Renal failure
- Respiratory failure
- Ovarian torsion
- Ileus

## Initial assessment

### History

### Examination

- General including weight and girth
- CVS
- Respiratory
- Abdominal

### Investigations

- Complete blood count (CBC)
  - Haemoconcentration with PCV > 0.38
- Urea and electrolytes
  - Hyponatraemia with Na+ < 130
  - Mildly elevated potassium
- Liver function tests (LFT's)
  - Elevated
- Coagulation and D-dimers
  - Elevated D-dimers
  - Elevated fibrinogen
  - Reduced anti-thrombin III levels
- HCG if 16 days after oocyte pickup

### Investigations to consider if clinically indicated

- > USS with Doppler's if ovarian torsion suspected
  - Enlarged ovaries with multiple ovarian cysts
  - Ascites
- > Chest X-ray (CXR)
  - Pleural effusions
  - Interstitial oedema

**Suspected pulmonary embolism**

- Chest X-ray

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- Electrocardiography
- Arterial blood gases
    - Taken with the woman sitting
- Definitive diagnosis by either CT pulmonary angiogram (CTPA) or ventilation / perfusion (V/Q) scan depending on local availability
- Ventilation / perfusion (V/Q) scan
    - Discuss with radiologist as a ventilation / perfusion mismatch may occur secondary to pleural effusions and pulmonary oedema limiting diagnostic capability of test

## Management

OHSS is a self-limiting condition

The treatment objectives are to support the woman and prevent complications until vascular leakage resolves (days to weeks)

### Outpatient management is suitable for women with mild OHSS

**Mild OHSS is characterised clinically by**

- Mild symptoms / non-tense ascites
- Able to maintain oral intake (2-3 litres daily with no vomiting)
- Maintaining urine output (not concentrated)
- No shortness of breath / pleural effusions on examination
- Not requiring opiate analgesia
- No evidence of significant haemoconcentration (PCV < 0.45)
- Supported at home

**Management of mild OHSS includes**

- Reassurance
- Encourage oral fluid intake
- Education regarding symptoms and when to seek further help:
    - Abdominal bloating / pain
    - Nausea, vomiting, diarrhoea
    - Shortness of breath
    - Reduced urine output
- Arrange follow-up appointment in 2-3 days
- Encourage to gently mobilise but to avoid intercourse and strenuous activity

### Admission and inpatient management is required if women present with

- Pain from ascites requiring opiate analgesia
- Unable to maintain oral intake

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- Moderate to severe dehydration
- Tachycardia, hypotension, PCV > 0.45
- Oliguria
- Abnormal biochemistry
- Na+ < 135, K+ > 5.0
- Abnormal liver function
- Albumin < 26
- Pleural effusions / shortness of breath
- Evidence of thrombosis
- Difficulty mobilizing
- Unsupported at home

Women with OHSS may present to their fertility clinic, general practitioner, gynaecologist or to an emergency department. If presenting to an emergency department, the consultant on call must be advised of admission

If the woman is under the care a fertility clinic, ensure that the consultant gynaecologist or clinical nurse at that clinic, is also notified of the woman's presentation

- Further advice can be obtained by contacting the
  - Gynaecologist / fertility specialist
  - Intensive care specialist
  - Or physician on call

## Inpatient management

**Notify consultant of any significant changes in condition. Transfer to a high dependency unit or intensive care unit may be required**

### Monitor Severity of OHSS

- Observations every 4 hours
- Temperature
- Pulse rate
- Blood pressure
- Respiratory rate
- Oxygen saturation
- Strict fluid balance chart
- Daily girth and weight
- Daily assessment of tenseness of ascites
- Daily chest assessment (looking for development of pleural effusions)
- Check calves daily for swelling and tenderness
- Daily blood tests (May be required every 12 hours if abnormal or if oliguria)
- Complete blood count, D-dimers
- Urea, electrolytes, liver function tests

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## Thromboprophylaxis

- TED stockings
- Clexane 40 mg subcutaneous daily
- Mobilise as able

## Antiemetics

## Analgesia

- Panadol and opiates as required
- Non steroid anti-inflammatory drugs (NSAID's) should be avoided due to effects on renal function and possibility of pregnancy
- If pain is severe or unilateral consider ovarian torsion
- Ultrasound with Doppler's

## Maintain intravascular volume / renal function (fluid management)

- Initial bolus of 500 mL normal saline (sodium chloride 0.9 %) intravenously, if significantly dehydrated
- Restrict fluid intake to 2.0-2.5 litres daily (oral plus iv) and aim to keep urine output > 30 mL / hour
- If oliguric (or unsure of urine output) catheterize with hourly urine measurements and transfer woman to a high dependency unit (HDU) or intensive care unit (ICU)

## IV fluids

- Normal saline (sodium chloride 0.9 %) at 100 mL / hour initially
- If urine output < 30 mL / hour for 2-4 hours commence 4 % albumin (500 mL at 100 mL / hour) and alternate with normal saline 0.9 %. Albumin is often best utilized overnight as urine output is always reduced at night
- If albumin is required, transfer woman to a HDU or ICU for close monitoring and early detection of complications e.g. pulmonary oedema
- If remains oliguric after 4 % albumin start 20 % albumin (100 mL over 30 minutes)
- If no improvement consider ascitic drainage to decompress renal artery

Urinary tract infections may occur with prolonged catheterisation and should be treated with appropriate antibiotics

## Indications for paracentesis (drainage of ascites)

- Persistent oliguria
- Severe abdominal pain or tense ascites
- Poor ventilation or pleural effusions
- Ascites drain to be inserted under ultrasound guidance
- Drain 2 litres per 24 hours and clamp when daily drainage complete

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### Maintenance of respiratory function

- Physiotherapy
- If oxygen saturation decreased / respiratory compromise
    - Arterial blood gases
    - Commence oxygen
    - Consider draining ascites
    - Physician review (? pulmonary embolism or infection)
    - Consider drainage of pleural effusions

### Management of concurrent pregnancy

- HCG levels may not appear to double every 48 hours due to intravascular changes
- Avoid HCG injections (exacerbate OHSS)
- Progesterone pessaries are not contra-indicated
- Avoid medications that are harmful in early pregnancy
- Very occasionally termination of pregnancy is required for very severe OHSS

### Transfer to ICU may be required if

- Unable to maintain urine output / renal failure
- Significant pleural effusions and /or respiratory compromise
- Significant thromboembolic event

## Reference

1. Royal College of Obstetricians and Gynaecologists (RCOG). The management of ovarian hyperstimulation syndrome. Green-top Guideline No. 5. September 2006.

## Abbreviations

| | |
|---|---|
| AMH | Anti-mullerian hormone |
| BMI | Body mass index |
| CBC | Complete blood count |
| CTPA | CT pulmonary angiogram |
| CVS | Central venous system |
| CXR | Chest X-ray |

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| | |
|---|---|
| DVT | Deep venous thrombosis |
| FSH | Follicle stimulating hormone |
| hCG | Human chorionic gonadotropin |
| HDU | High dependency unit |
| ICU | Intensive care unit |
| IV | Intravenous |
| LFT's | Liver function tests |
| mg | Milligram(s) |
| NSAID's | Non steroid anti-inflammatory drugs |
| OHSS | ovarian hyperstimulation syndrome |
| PCV | Packed cell volume |
| PCOS | Polycystic Ovarian Syndrome |
| K+ | Potassium |
| PE | Pulmonary embolism |
| RCOG | Royal College of Obstetricians and Gynaecologists |
| Na | Sodium |
| TED | Thrombo-embolic stockings |
| USS | Ultrasound |
| VEGF | vascular endothelial growth factor |
| V/Q scan | ventilation / perfusion scan |

## Version control and change history

**PDS reference:** OCE use only

| Version | Date from | Date to | Amendment |
|---|---|---|---|
| 1.0 | 30 Dec 12 | 17 July 12 | Original version |
| 2.0 | 17 July 12 | current | |
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