

Moderate Ovarian Hyperstimulation Syndrome in a Nulliparous Oocyte Donor: A Case Report

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Abstract

Background: Ovarian hyperstimulation syndrome (OHSS) is a potentially fatal iatrogenic side effect of regulated ovarian hyperstimulation used for assisted reproduction. The pathogenesis of OHSS is unknown, however, the process is related to increased vascular permeability which leads to fluid shift into the extravascular space leading to ascites, hemoconcentration and electrolyte imbalances. Currently, vaso-active mediators mainly vascular endothelial growth factor produced by the granulosa cells are essential to the pathogenesis of OHSS. **Case Presentation:** She is a 22-year-old lady who presented to St. Elizabeth Hospital and Fertility Centre, Enugu, Nigeria with a history of abdominal swelling of one day duration. She had undergone oocyte retrieval 6 days prior to presentation. Abdominal examination and ultrasonographic findings were in keeping with moderate (Grade 3) OHSS. She was given tablet cabergoline 0.5 mg daily for 3 days and she also had two transvaginal ultrasound guided ascitic fluid aspirations and she recovered thereafter. **Conclusion:** OHSS is a serious complication of controlled ovarian stimulation and should be anticipated in assisted reproductive technology treatments.

Keywords

OHSS, Donor, Oocyte

1. Introduction

Ovarian hyper stimulation syndrome (OHSS) is a medical complication of ovula-

tion induction associated with exogenous gonadotropin. It can also be occasionally seen in clomiphene induced cycles [1].

The main pathophysiology of OHSS is an increase in capillary permeability resulting in a fluid shift from the intravascular to the third spaces and it is mediated by increased ovarian secretion of vasoactive substances including vascular endothelial growth factor (VEGF), elements of the rennin-angiotensin system, and other cytokines [1].

The risk factors usually associated with OHSS include young age, low body weight, PCOS, higher doses of gonadotropins, and previous episodes of hyperstimulation [1]. The risk is known to increase with serum estradiol levels 2500 pg/mL and if the number of developing ovarian follicles is greater than 20 [1].

The signs and symptoms includes: ovarian enlargement, lower abdominal pain and mild nausea and vomiting, passing of loose stool, and abdominal distention and this occurs in up to one-third of women who undergo superovulation cycles [1]. Oral analgesics and counseling of affected women on the signs and symptoms of worsening illness are required; they should also be counseled to avoid intercourse as it can be painful and it can lead to ovarian rupture [1]. If the symptoms worsen, or the patient develops ascites, it is a signal that the illness is worsening and treatment using anti-emetics and a very potent oral analgesic is required. Oral fluid intake should be maintained at no less than 1 L/day; mild physical exercise is more advisable than bed rest to prevent the risk of a thrombotic event while strenuous physical activity should be avoided to reduce the risk of ovarian torsion [1]. Weight gain of approximately 0.90 kg which is equivalent to 2 pounds and a decrease in urinary frequency are indications for immediate clinical and laboratory re-evaluation [1]. Pregnancy is known to increase the risk of progression of OHSS to a severe form because of the rapidly rising hCG levels, so a pregnant woman with superimposed OHSS will benefit a lot from close monitoring [1]. Patients who develop features of severe OHSS which include severe pain, rapid weight gain, tense ascites, hemodynamic instability, respiratory difficulty, progressive oliguria, and laboratory abnormalities should be hospitalized.

Inpatient care for patients who are hospitalized includes frequent checking of patients' vitals, measuring abdominal girth and fluid intake and output, daily weighing, imaging tests which includes chest x-ray and echocardiogram when pleural and pericardial effusion is suspected. Serial renal, liver function tests and hematocrit levels should be obtained [1].

Adequate rehydration should be carried out to restore plasma volume and not contribute to the accumulation of extravascular fluid. After initial rehydration, intravenous fluids should be administered judiciously in the lowest volumes necessary to maintain adequate urine output and relieve hemoconcentration. Because of the likelihood of the patient coming down with hyponatremia, saline is preferable to lactated Ringer's solution, but when saline fails, slow infusions (over 4 hours) of albumin (25%; 50 - 100 g at 4 - 12 h intervals) can effectively expand plasma volume [1]. Excessive use of diuretics is not advised. Intravenous rehydra-

tion can be reduced substantially after diuresis begins and oral intake is tolerated. Hyperkalemia may require specific treatment to move potassium into the intracellular space (insulin/glucose, sodium bicarbonate) or to prevent cardiac arrhythmias (calcium gluconate) [1].

Ultrasound-guided aspiration can be very helpful in women with painful ascites, pulmonary symptoms, or oliguria that does not respond to fluid management. Fluid removal should be gradual to avoid the negative effects of sudden fluid shifts [2]. Full-length thromboembolic deterrent stockings are recommended and prophylactic heparin therapy (5000 units every 12 hours) should be considered in patients that have severe hemoconcentration [2].

The aim of this report was to document a case of ovarian hyperstimulation syndrome in an oocyte donor.

2. Case Presentation

She was a 22-year-old P 0 + 0 with a BMI of 17.5 kg/m² who presented at St Elizabeth Hospital and Fertility Centre with abdominal swelling of 1 day duration. There was no history of vomiting, constipation or abdominal pain. There was no fever. She underwent an oocyte retrieval procedure 6 days prior to presentation. A total of 30 follicles were aspirated which yielded 19 oocytes. She was down regulated using GnRH agonist Luprodex 3.75 mg and stimulated using human menotrophic gonadotropin (Menotropin) in a daily dose of 225 iu and human chorionic gonadotrophin was used for trigger.

Clinical abdominal examination showed a distended abdomen which was not tender; the percussion note was dull. Abdominopelvic ultrasound scan showed bilaterally enlarged ovaries with multiple cysts of varying sizes and ascites which were in keeping with moderate OHSS.

She was admitted and placed on tablet cabergoline 0.5 mg for 3 days. Forty-eight hours following admission, she had a transvaginal ultrasound guided ascitic fluid aspiration which yielded about 2.5 litres due to abdominal discomfort. The ascitic fluid accumulated again within 24 hours and a second transvaginal ultrasound guided aspiration was done which yielded about 1.5 litres. Following this abdominal swelling resolved and the patient was subsequently counseled and discharged (**Figure 1**).

3. Discussion

Ovarian hyper stimulation can be life threatening when not managed on time. Our index patient had moderate OHSS according to Royal College of Obstetrics and Gynecologists (RCOG) classification [3]. and this is in keeping with a study that was done by Tober DM *et al.* (2023) where researchers identified a 1.5% incidence of severe OHSS and a 33.5% incidence of moderate OHSS among [1] 149 donors throughout 400 egg retrieval cycles [4].

Theoretically, any woman receiving controlled ovarian stimulation with gonadotropin could experience OHSS [5]. Our patient had 30 follicles after stimula-

tion and 19 oocytes were retrieved from her and this is in keeping with the study by Jayapraskan *et al.* which indicated that the development of 20 or more follicles

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PELVIC SCAN

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The uterus is anteverted, non-gravid and measures 6.7cm x 3cm x 3.3cm in diameter.

The endometrial thickness measures 7.9mm.

The uterine cavity is empty.

The cervix measures 2.0cm

The Internal Os is closed.

Bilaterally enlarged ovaries with multiple cysts of varying sizes.

There is presence of free fluid in the peritoneal cavity.

Conclusion: Multiple ovarian cysts

Ascites



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Figure 1. Picture of an ultrasound scan result belonging to the index patient, showing the presence of multiple ovarian cysts and ascites.

after ART stimulation considerably increased the risk of OHSS [6]. A study by Steward, R. G. *et al.* also demonstrated that the retrieval of more than 15 oocytes significantly increases the risk of developing OHSS [7]. Other risk factors associated with the development of OHSS includes: age less than 35, black race, polycystic ovarian syndrome, lower BMI [5]. These factors are present in the index patient as she is a 22-year-old, from Nigeria which is of black race and her BMI is 17.5 kg/m².

The diagnosis of moderate OHSS was made in our index patient who presented with abdominal swelling. Abdominal examination showed a distended, non-tender abdomen with dull percussion note. Abdominopelvic ultrasound scan showed bilaterally enlarged ovaries with multiple cysts of varying sizes and ascites and this corresponds to moderate stage of OHSS according to RCOG. The diagnostic criteria for OHSS includes: clinical evaluation, ultrasonography and biochemical in-

vestigations [3]. OHSS presents with abdominal bloating, mild abdominal pain, ovarian size usually <8 cm for mild OHSS [3]. For moderate OHSS: it presents with; moderate abdominal pain, nausea \pm vomiting, ultrasound evidence of ascites, ovarian size usually 8 - 12 cm [3]. For severe OHSS: clinical ascites (\pm hydrothorax), oliguria (<300 ml/day or <30 ml/hour), haematocrit > 0.45, hyponatraemia (sodium < 135 mmol/l), hypo-osmolality (osmolality < 282 mOsm/kg), hyperkalaemia (potassium > 5 mmol/l), hypoproteinaemia (serum albumin < 35 g/l), and ovarian size usually > 12 cm [3]. For Critical OHSS: the patient will present with tense ascites/large hydrothorax, haematocrit > 0.55, white cell count > 25,000/ml, oliguria/anuria, thromboembolism, and acute respiratory distress syndrome [3].

The treatment of choice for moderate OHSS involves fluid replacement and supportive care to improve intravascular perfusion [5]. Studies have shown that transvaginal aspiration under ultrasound guidance and fluid replacement with intravenous crystalloids helps to resolve it and also it helps to prevent injury to the enlarged ovary [5] and this was done for our index patient.

4. Conclusion

OHSS is a serious complication of controlled ovarian stimulation which can be life threatening if not attended to. It should be anticipated in assisted reproductive technology treatments, so that prompt recognition and intervention can be initiated. If, after medical treatment, the symptoms do not resolve, serial transvaginal aspiration can be used in the management of moderate ovarian hyperstimulation syndrome as it aids adequate visualization to be able to know when all the ascitic fluid has been aspirated. Egg donors should also be adequately counseled about OHSS and its symptoms before egg retrieval is done.

Consent

Consent was obtained from the patient before publication of this case report and the images presented.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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