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Ovarian Hyperstimulation Syndrome with Pleural Effusion: A Case Report

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Abstract

Background & Objective: Pleural effusion is a rare and life threating manifestation of ovarian hyper stimulation syndrome, and can lead to ICU admission. It is a rare case of pleural effusion following controlled ovarian hyper stimulation artificial reproductive technique. Case report: A 22 years old women was admitted in ICU. The patients presented with complain of dyspnea, nausea, vomiting and abdominal pain. Ultrasound guided paracentisis for drainage of massive ascites was premed also was necessary for bilateral thoracentesis pleural effusion. Conclusion: Although OHSS still occurs and relatively common but pleural effusion is an unusual finding of this syndrome. Physicians should be familiar with risk factors, early diagnosis and aware of the rare and underestimated complication if OHSS such as pleural effusion that can be compromise the health of the patient or to cause even death.

Keywords: Ovarian Hyper Stimulation Syndrome, Pleural Effusion, Case Report, ICU.

Introduction

In order to increase the effectiveness of IVF, ovarian stimulation is always used; however, it can be associated with the risks and disadvantages like ovarian hyper-stimulation syndrome (OHSS). OHSS is a complication that occurs during luteal phase in hormonal treatment cycles. In most cases its symptoms are self-limiting (Junqueira et al., 2012), but sometimes it is also a rare cause of admission to the ICU's aggressive care unit. OHSS occurs being followed by an increase in ovarian cysts and fluid shift from the vascular space to the third space due to an increase in capillary volume. This event is dependent upon the administration of hCG after exacerbated ovarian response by triggering gonadotropins. This syndrome generally occurs in 5% of women under IVF or IUI (Neulen et al., 1995). Despite the precise control during ovarian stimulation and the hard and protective protocol and the criteria for cancellation of the therapeutic cycle, OHSS occurs. The clinical manifestations of OHSS are categorized into three groups. In the mild type of OHSS (8-23%), the ovaries are enlarged, it appears with the lower abdominal pain, nausea, vomiting, diarrhea and abdominal distension; while in moderate one (1-7%) it emerges, additionally, with liquid (ascites) accumulation and mild abdominal distension and in severe type in which approximately 0.5-5% of cycles are examined, it is manifested as hemodynamic imbalance, thrombosis, oliguria, Kidney failure, liver damage, pleural effusion, rarely as pericardial effusion, and adult respiratory distress (Junqueira et al., 2012; Bergh & Navot, 1992; Mullinet al., 2011) which can be life-threatening. Pleural effusion is a rare outbreak of ovarian hyper-stimulation syndrome, whose pathogenesis has been not well known, but this strong hypothesis is proposed that the role of systemic factors is greater than that of fluid leakage from the enlarged ovaries (Korula et al., 2010). Due to the increased use of fertility supportive methods, the physicians are facing with care of these patients to be vigilant and conscious of these clinical conditions and rare manifestations that can lead to multi-organ dysfunction and ultimately death. For this reason, this report describes a rare case of pleural effusion following ovarian hyper-stimulation through IVF vitro fertilization.

Case report

A 22-year-old patient was hospitalized for severe dyspnea, nausea, vomiting and abdominal pain. At the time of the acceptance he had blood pressure of 123.95 mm Hg, heart rate of 113 per minute and respiratory rate of 30 per minute. In the physical examination, a clear abdominal ascites was observed. Due to dyspnea, lung sounds were not audible in the lung examination. At the time of admission to ICU, her number of leukocytes was 2030, with hemoglobin of 14.9 mg/dL, creatinine level of 0.9 and albumin level of 3.3 mg/dL. Arterial blood gases showed that oxygen pressure was 57% and oxygen saturation 84%. Coagulation and hepatic profile was normal. Rib cage

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radiography showed two-sided pleural effusion without cardiomegaly. Pregnancy test was negative, and in abdominal ultrasonography, the enlarged ovaries (right ovary of 84 mm in 118 mm and left ovary of 90 mm in 120 mm) were reported as containing multiple cysts, the largest of which was 45 mm, and the pelvic fluid accumulation of 800-1000 cc. In an interview with the patient, having a history of 4 years of infertility, treated with clomiphene, merional and hcg injection for inducing ovulation, the abovementioned symptoms appeared. With these history and clinical symptoms, the pleural effusion, caused by ovarian hyper-stimulation, was diagnosed in the patient. In the ICU, the patient was monitored daily for weight, intra-abdominal pressure, abdominal cavity, blood pressure, fluid intake and urine output, and laboratory tests; she also received therapeutic care such as serum therapy, oxygen therapy with a mask, albumin therapy, antibiotic intake, Heparin to prevent deep vein thrombosis and other supportive therapies. Renal function was supported by prescribing diuretics (furosemide of 5 mg/hr); the need for dialysis was not observed in the patient. For the removal of pleural effusion during the first time, a right-sided chest was placed under ultrasound guide for liquid intra-lung dispersion. 700 ml of liquid and blood were removed. Due to the lack of healing, it was done bilaterally, and every time 1500 cc and 2400 cc of fluid were removed, and paracentesis was performed twice to remove ascites from the vaginal area; the patient was intubated two days later due to the persistence of respiratory distress and supportive therapies continued. After removing the tube, the patient's general condition gradually recovered and she was discharged after 21 days.

Discussion and Conclusion

OHSS is an iatrogenic complication that is directly associated with hCG exogenous hormone injections and is self-limiting, but may sometimes be continuing and life-threatening (Singh et al., 2010). Its exact pathology is not fully known, but predetermined risk factors predicting the incidence of OHSS have been known; they include young women, individuals with PCOS, lower BMI, higher dose of exogenous gonadotropin, retrieval of more than 20 follicles and high blood levels of E2 estradiol, previous history of OHSS (Navot et al.,1988; Delvigne et al., 1993; Whelan et al., 2000). Identification of risk factors is the best way to prevent the onset of this syndrome. In ovulation-induced patients, the warning signs for doing supportive care include having a moderate size of follicles, abdominal distension and patient's discomfort. Controlling therapy response to gonadotropins injection by ultrasound and E2 level measurement as a standard predicting method for OHSS patients is introduced and used. By incidence of OHSS symptoms prior to injection of hCG, the cancellation of the cycle, and lack of excessive ovarian stimulation for prevention have to be considered (The Management of Ovarian Hyperstimulation Syndrome Green-top Guideline No. 5; February, 2016).

In OHSS, fluid shift from the third space into the arteries leads to abdominal massive ascites, thoracic and pericardial, the first known symptom of this syndrome. The occurrence of pleural effusion in severe OHSS has been reported to be 10% (Jahromi et al., 2017) and various causes have been mentioned for it, one of which is the high level of estrogen, which is usually associated with ascites. The occurrence of pleural effusion without ascites is rare. Mullin reported two cases of pleural effusion without ascites with only complaint of dyspnea (Mullinet al., 2011), while in the current report the patient was referred to with ascites.

Loret de Mola states that pleural effusion in OHSS occurs most often in the right lung as reported also in the present study. This is due to the lower left ventricular drainage compared to the left and the diaphragmatic cavities on the right side, leading to a shift of fluidity and the ascites (Man etal., 1997); while there was bilateral hydrothorax in the present patient.

Respiratory distress in OHSS patients can lead to pulmonary embolism, pleural effusion, ARDS, and pulmonary edema. When there is pleural effusion, the pulmonary drainage decreases and leads to occurrence of dyspnea. Evaluation of pleural effusion in the first stage is based on a physical examination, but radiography should be used to confirm the diagnosis. However, this diagnostic procedure is prohibited in the pregnant patient (Junqueira et al., 2012; February, 2016). Patients with severe OHSS having any of the symptoms of ARDS, kidney failure, thromboembolism, pleural effusion should be hospitalized in the intensive care unit. Laboratory examination (including full blood counting, liver and kidney function tests, coagulation factors), pelvic ultrasound, chest x-ray should be considered for respiratory symptoms, electrocardiograms and echocardiograms in cases of suspected pericardial effusion. Also a daily investigation of controlling the liquids of consumption and disposal, measurement of round the abdomen, hematocrit, electrolytes and weight are necessary in these patients. Providing supportive therapies should be done such as symptomatic treatment of nausea and vomiting, and hypotension until removing symptoms.

In the present study, the patient referred to with severe dyspnea, nausea, vomiting, ascites and abdominal pain, which led to her hospitalization in ICU. To remove pleural effusion, the tube chest under sonography and paracentesis guide was used from the vagina for removing ascites; due to the persistence of respiratory distress, the patient was intubated and supportive therapies continued until complete recovery. In other reports, as in the present study, some patients were diagnosed with severe OHSS and major ovarian symptoms, large ascites, pleural effusion, abdominal pain and dyspnea; they were treated by paracentesis and tube chest (Korula et al., 2010; Singh et al., 2010; Loret de et al.,1997; Recep et al., 2008; Recepet al., 2016; Mishra et al., 2017; Srivali et al., 2016)

Junqueira observed three cases of pleural effusion following OHSS, all of which were under pulmonary drainage, ranging in age from 27-33 years old; one case had only a history of PCOS (Junqueira et al., 2012).The patient had two risk factors for OHSS, while in the present report, the patient was only young and there was no evidence for other laboratory factors and ultrasound.

In the event of occurring OHSS during the treatment cycle, IVF is delayed until patient stabilization or complete removal of

symptoms. During this time, we can freeze and store oocytes or amber. (Loret de et al., 1997).

In the end, the pleural effusion following OHSS is an unusual cause of hospitalization in infertile patients, but with increasing use of fertility supportive techniques, the incidence of this syndrome is increasing. For this reason, by knowing more about the risk factors, early diagnosis and providing appropriate supportive care, the physician will be able to maintain the maternal fertility and maternal health and reduce the risks and even death of the patient.

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