Isolated unilateral pleural effusion as the only manifestation of the ovarian hyperstimulation syndrome

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ABSTRACT

Isolated unilateral pleural effusion is uncommon presentation of ovarian hyper stimulation syndrome. The pathogenesis of this syndrome involved an increased permeability of the ovarian capillaries and of the mesothelial vessels triggered by the release of vasoactive substances by the ovaries under human chorionic gonadotropin stimulation. Early recognition of this unusual presentation of ovarian hyperstimulation syndrome should allow for physicians to ensure a better and minimally invasive management of these potentially pregnant patients.

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Ovarian hyper stimulation syndrome (OHSS) is a severe complication arising from treatment with gonadotropin for induction of follicular growth and maturation in infertile women.[1] The syndrome is a serious complication of induced ovulation (approximately 2% incidence in the United States of America) and can result in significant morbidity and mortality.[2] The syndrome can fall into 4 clinical stages increasing severity: 1. Mild, with abdominal distension and discomfort; 2. Moderate, with as cities on ultrasound examination; 3. Severe, with as cites clinically apparent with or without another effusion (pleural, rarely pericardial), and a hemoconcentration (hematocrit >45% and white blood cell count >15,000 cells/uL; and 4. In addition to the above signs, patients can develop hypovolemic shock, acute renal and respiratory failure, and thrombotic disorder.[3,4] Although this syndrome is well recognized by obstetricians, there is limited information, disseminated among chest physicians.[5] Due to the increased use of therapeutic strategies for infertility, the pulmonary complication of this syndrome should be suspected on clinical grounds and identified early to allow more appropriate diagnosis and management.[3,4] We report one case of OHSS, and review the pathogenesis and clinical course of isolated pleural effusion.

Case Report. A 36 year old lady presented to the infertility clinic after 5 days post embryo transfer, positive pregnancy test, with shortness of breath, Right sided chest tightness and dry cough for 3 days, she denied fever, wheeze, hemoptysis, or leg swelling. She was followed by the infertility clinic as anovulatory cycle due to polycystic ovary disease for the last 3 years. At the time of HCG injection the peak estradiol was 16000 p mol/L, with 25 oocytes was retrieved. On examination she was well, a febrile, pulse 91 beat/min, blood pressure 100/70 mm Hg, O_2 saturation 94% on room air, no air entry on right side of the chest, stony dullness on the right side, her abdomen is soft, no evidence of ascites, and no clinical sign of deep vein thrombosis. The arterial pH 7.48 PO_2 79 mm Hg,

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PCO_2 29mm Hg. White blood cell count 15,000 cells/uL, hematocrit was 49%, renal and liver function were normal, β-HCG 217 IU/L. The chest radiograph was not carried out as the risk of radiation to the fetus. The chest and abdominal ultrasonography showed large right pleural effusion, no ascites, and enlarged ovaries measuring: right 8x 7x5 cm, left 8x5x6 cm **Figure 1**. Doppler ultrasonography of both legs showed no evidence of deep vein thrombosis. The pleural fluid was exudates with protein 41g/L, it remain sterile. The chest drain was inserted in the right side under ultrasound guidance, drained 7.2 L over 6 days. With marked improvement of her clinical condition, pleural effusion did not recur during the follow up until she delivered her baby girl.

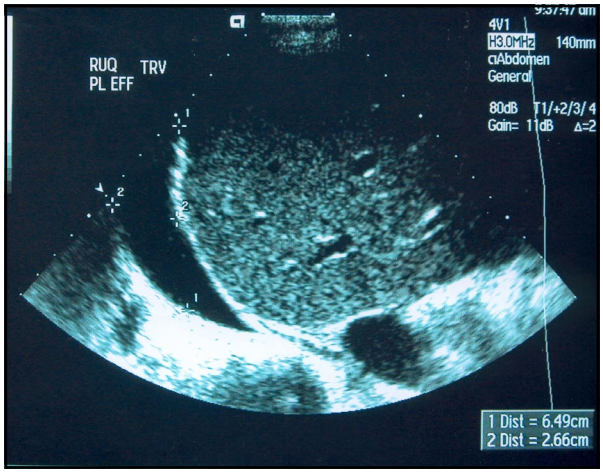

Figure 1 - The chest ultrasonography.

Discussion. This condition is defined as an iatrogenic complication of ovarian stimulation. It can be extremely severe, with morbidity reaching 5% of in vitro fertilization.[4] A recent Canadian study where 771 patients were treated with menotrophins that severe OHSS occurred in 22 patients (3%), pleural effusion occurred in 5 (1%), and only one required a thoracentesis (0.1%).[6] Sporadic cases of OHSS have been reported, presenting with pleural exudates or transudates, more common exudates effusion.[4]

In the context of an isolated pleural effusion developing during pregnancy, ruling out pulmonary embolism is warranted, in the absence of clinical or biological signs definitely ascertaining the diagnosis of OHSS, thromboembolic disease should be suspected, particularly in the context of reduce venous return secondary to enlarged ovaries, a high estrogen, and hemoconcentration.[4] Ovarian hyperstimulation syndrome is characterized by ovarian enlargement and increased vascular permeability, leading to marked transudation of a protein-rich fluid from the vascular compartment into the cavity.[6] The factors, which predispose to the syndrome, are signs or a history of polycystic ovary syndrome, younger age, lean body habitus, and active pregnancy.[7,8]

The pathogenesis of OHSS has to be elucidated. The syndrome represents an over expression of the normal ovulatory process described in the pregnancy. The mechanism underlying the clinical manifestation of OHSS involves an increased permeability of the ovarian capillaries and of the mesothelial vessels triggered by the release of vasoactive substances by the ovaries under HCG stimulation.[4] The pathogenesis of OHSS is generally believed to represent the overproduction or altered expression of vasoactive substances of ovarian origin that are critical for follicle release or neovascularization of the developing corpus luteum.[6] Recent evidence argues for a critical role of several mediators including various cytokines such as interleukin IL-1, IL-6, IL-8, tumor necrosis factor, more recently, vascular endothelial growth factor (VEGF) has been identified in human plays a significant role in the pathogenesis of OHSS.[9-12] The isolated hydrothorax may result from the combination of positive intra-abdominal pressure, negative intrathoracic pressure, and diaphragmatic defects that promote the transfer of intra abdominal fluid into the pleural fluid, resulting hydrothorax in the absence of abdominal fluid.[7] In our case and the majority of the reported cases, this preferential location might be explained by a capillary leak and exudation into the plural space due to the decreased right lymphatic drainage as compared to the left side, in addition to the defect in the diaphragm, more common in its right portion.[11,13,14]

In conclusion, OHSS presented with isolated pleural effusion usually has benign course, spontaneously favorable outcome or thoracentesis might be indicated, and clinical context can be particularly misleading for pulmonary embolism. The physician should be aware of this syndrome, in order to ensure a better and minimally management of these potentially pregnant patients.

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