Case Report

Symptomatic Unilateral Pleural Effusion Secondary due to Ovarian Hyperstimulation Syndrome

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Abstract

Isolated pleural effusion is a rare presentation of ovarian hyperstimulation syndrome following ovulation induction therapy. We hereby report the case of a 24-year-old female who presented with unilateral moderate pleural effusion following ovulation induction therapy. Therapeutic thoracentesis was performed to relieve the breathlessness in this case. **[Indian J Chest Dis Allied Sci 2016;58:199-201]**

Key words: *In-vitro* fertilisation, Ovarian hyperstimulation syndrome, Pleural effusion.

Introduction

Ovarian hyperstimulation remains one of the dreaded complications of ovulation induction. It has a wide spectrum of presentation ranging from being asymptomatic to severe presentation in the form of acute respiratory distress and shock, requiring admission to an intensive care unit. The complete pathogenesis is yet to be understood which makes this condition more complex.[1] Isolated pleural effusion without development of ascites is a rare presentation of ovarian hyperstimulation syndrome.[2] We report the case of a 24-year-old female presenting with isolated pleural effusion following ovulation induction.

Case Report

A 24-year-old female, who was married for three years and was undergoing treatment for primary infertility by a gynaecologist presented to us with complains of dry cough with scanty expectoration, breathlessness and right-sided pleuritic chest pain since one week. There was no history of any fever or any other constitutional symptoms. On examination, patient was found to have tachycardia and tachypnoea and reduced breath sounds on the right side of the chest. Other systems examination was normal. The patient had undergone four cycles of controlled ovarian stimulation using human chorionic gonadotropin (HCG) including the present one. The first two cycles had failed and third had been abandoned due to poor oocyte quality. Patient had already been on ovulation induction drugs including clomiphene citrate.

Physical examination revealed pulse 90/min, respirations 30/min, blood pressure 122/84 mmHg. The electrocardiogram was normal, pulse oximetry showed oxygen saturation of 90%. Chest radiograph showed evidence of right-sided moderate degree pleural effusion (Figure 1). Cytologic results, culture and staining for bacteria and fungi and acid-fast bacilli staining were negative. Diagnostic thoracentesis was done and pleural fluid reports revealed an exudative effusion. Pleural fluid characteristics were as follows: protein 5.1g/dL, glucose 91mg/dL, lactate dehydrogenase 218IU/L, adenosine deaminase 17.7IU/L. Liver and renal functions were normal. Total leucocyte count was 14000/mm^3 with a differential leucocyte count of 76% neutrophils, 20% lymphocytes, 4% eosinohphils. Erythrocyte sedimentation rate was 26mm at the end of the first hour. Ultrasonography of the abdomen and pelvis showed enlarged ovaries

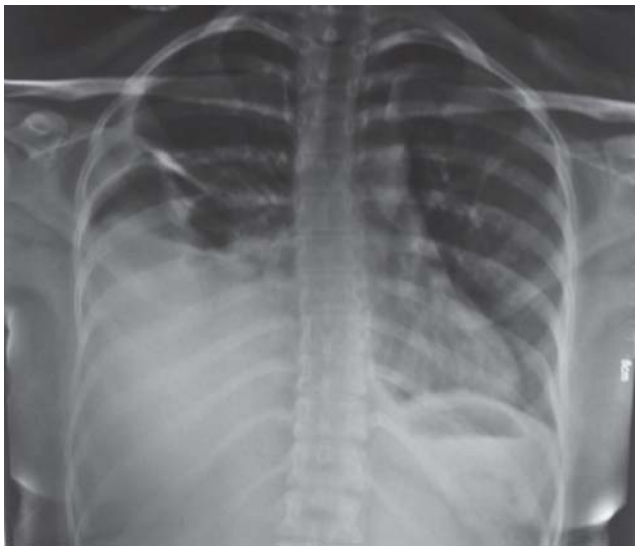

Figure 1. Chest radiograph (postero-anterior view) showing right-sided moderate pleural effusion.

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with multiple follicles; three follicles were greater than 10mm in size, there was no free fluid (Figure 2). There was no ascites. Serum oestradiol levels were greater than 3000pg/mL.

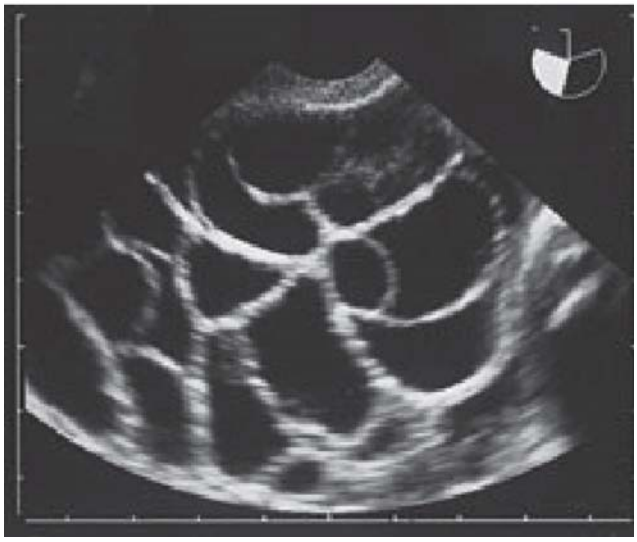

Figure 2. Ultrasound pelvis showing enlarged ovaries with multiple follicles, three follicles >10mm size, no free fluid.

She was managed conservatively with supplemental oxygen, parental broad-spectrum antibiotic, low molecular weight heparin for deep vein thrombosis prophylaxis, and supportive therapy. Ovarian stimulation therapy was stopped. Therapeutic aspiration was done and around 800mL fluid was drained as the patient was tachypnoeic and oxygen saturation was low. Repeat chest radiogrpah after thoracocentisis showed minimal effusion. Patient's general condition improved following which she was discharged with supportive therapy. Chest radiograph after 10 days of follow-up showed complete resolution of pleural fluid (Figure 3). Patient did not have any episode of pleural effusion during the follow-up period.

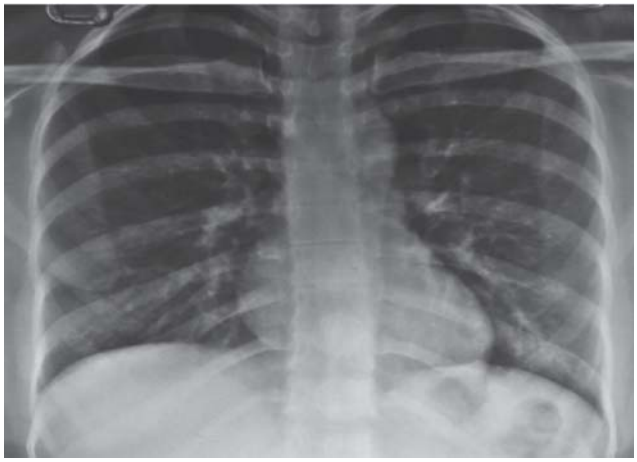

Figure 3. Chest radiograph (postero-anterior view) done during follow-up at 10 days showing complete resolution of pleural effusion.

Discussion

Ovarian hyperstimulation syndrome is a serious iatrogenic complication of assisted reproduction technology.[1] There is enlargement of ovaries with increase in size of follicles, neoangiogenesis and fluid shift from intravascular space to the peritoneal, pericardial and pleural spaces due to increased capillary permeability. The syndrome is most commonly observed with post-HCG administration and less frequently with clomiphene citrate.[2] A recent review has highlighted the importance of this condition due to increasing number of cases of *in-vitro* fertilisation, and ovarian hyperstimulation syndrome is on the rise.[3]

The exact pathophysiology is unknown but this underlying condition is likely due to release of vasoactive substances from the ovary which enters the systemic circulation or gets released into the peritoneal cavity and causes capillary vasodilatation. Interleukin-6 (IL-6), tumour necrosis factor-alpha (TNF-α) have been implicated due to their markedly elevated levels in follicular, ascitic and pleural fluid and serum. Adding specific antibodies against vascular endothelial growth factor (VEGF) is able to neutralise 70% of capillary permeability activity, and thus, VEGF was thought to be the key component which facilitated capillary permeability.[4] This leads to the development of ascites, pleural effusions, oedema and hemoconcentration. There are probably two factors responsible for the accumulation of pleural fluid. In cases of bilateral effusions, the probable mechanism is a generalised capillary leak syndrome and in right-sided pleural effusions, possibly the fluid moves directly from the peritoneal space to the pleural space. Patients can present with a wide range of symptoms and signs. This syndrome is characterised by ovarian enlargement, ascites, pleural effusion, hypovolaemia, haemoconcentration, and oliguria.[5] Respiratory symptoms develop 7-14 days after the HCG injection. Isolated unilateral pleural effusion secondary due to ovarian hyperstimulation syndrome has been described.[6]

In our case patient had developed pleural effusion during initial days with no other signs and symptoms. In other reports[7,8] pleural effusions were most commonly seen on the right side. Recently, occurrence of haemorrhagic pleural effusion secondary due to ovarian hyperstimulation syndrome has been reported.[9]

The treatment is primarily supportive. Administration of intravenous fluids is important for haemoconcentration which can cause hypovolaemia and lead to acute kidney injury and even death. Therapeutic thoracentesis should be performed if the patient has a large pleural effusion and complains of dyspnoea. Role of macromolecules like albumin and hydroxyethyl starch has been mentioned to prevent the development of this condition

by increasing the plasma oncotic pressure and binding to the inflammatory mediators. Recently, three cases presenting with massive pleural effusion secondary due to ovarian hyperstimulation syndrome who required pigtail catheter drainage (n=1) and mechanical ventilation (n=2) has been described.[10] Intravenous albumin administration at the time of oocyte collection is thought to have a preventive effect on the manifestations of the syndrome.[11]

In conclusion, ovarian hyperstimulation syndrome should be suspected in case any female with a history of ovulation induction presenting with ascites and pleural effusion. Treatment should be initiated at the earliest involving a multi-disciplinary approach along with obstetricians to prevent adverse complications and even death.

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