

Point of Care Ultrasound in the Diagnosis and Management of Severe Ovarian Hyperstimulation Syndrome

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Abstract

Presentation

A 32-year-old woman, presented with a 5-day history of non-productive cough, chest pain, shortness of breath and abdominal bloating. She had undergone Embryo Transfer Treatment 6 days previously.

Diagnosis

A point of care ultrasound (POCUS) exam was performed as part of her initial investigations which showed right pleural effusion, ascites and cystic ovaries.

Treatment

She received Oxygen, IV Fluids and Antibiotics and was referred to the Obstetricians.

Discussion

Point of care ultrasound (POCUS) aided the prompt diagnosis of ovarian hyperstimulation syndrome (OHSS) in this patient, making it possible for her to receive appropriate resuscitation and referral and an excellent outcome despite this being a case of severe ovarian hyperstimulation syndrome.

Introduction

Rapid Ultrasound in Shock (RUSH) is an emergency ultrasound protocol that helps clinicians determine cause of shock and hypotension in critically ill patients promptly. The application of this protocol in the management of our patient with undifferentiated shock was vital in her overall outcome.

Case Report

We present a case of a 32-year-old woman with a 5-day history of non-productive cough, chest pain, shortness of breath and abdominal bloating, which was worse in the last 24hrs.

She was clammy, hypotensive (BP 75/50mmHg) and tachycardic at 127bpm. She was in clinical shock. Her past medical history included embryo transfer 6 days previously, polycystic ovarian syndrome and ulcerative colitis. On examination, she had decreased air entry in her right lung base and a distended abdomen.

Her ECG showed sinus tachycardia with an S-wave in lead I, Q wave and T-wave inversion in lead III. A RUSH exam was performed to ascertain the cause of shock which showed right pleural effusion, ascites and cystic ovaries. Her bloodwork was significant for raised white cells, haematocrit, d-dimer, potassium and hyponatraemia.

Differential diagnoses included: Ovarian hyperstimulation syndrome, Sepsis, Pulmonary embolism and Community acquired pneumonia with Effusion and Ascites.

She received oxygen, IV fluids and IV Augmentin to cover for possible chest infection.

A CT scan ruled out a pulmonary embolus but confirmed pleural effusion and ascites.

She was referred to the Obstetricians with a diagnosis of Severe ovarian hyperstimulation syndrome (OHSS) due to the presence of ascites, hydrothorax, white cell count $>25 \times 10^9/L$ and oliguria. By this time, her systolic blood pressure was 110mmHg and heart rate was 96bpm. She was placed on fluid restriction and thromboprophylaxis initiated.

Discussion

The use of point of care ultrasound in managing patients with undifferentiated shock and hypotension facilitates rapid accurate diagnosis and the initiation of early goal directed therapy^{1,2}.

Rapid Ultrasound in Shock (RUSH) is 3-step emergency ultrasound protocol that helps clinicians determine cause of shock and hypotension in critically ill patients promptly³. It involves a 3-part assessment of circulatory status simplified as: the pump, the tank and the pipes. The 'pump' exam is an evaluation of cardiac status, using echocardiography to assess left ventricular contractility, right ventricular dilation and pericardial effusion. The 'tank' exam evaluates intravascular volume status by checking the fullness of the 'tank' (inferior vena cava and internal jugular vein size and collapsibility), the leakiness of the tank (hemothorax, hemoperitoneum, pleural effusion, ascites) and tank compromise (pneumothorax). The examination of the 'pipes' assesses the aorta and deep veins (femoral and popliteal veins) for rupture and clots respectively.

Ovarian hyperstimulation syndrome is a potentially life-threatening complication of assisted reproduction technology using ovarian stimulation treatments⁴. There have been some cases of spontaneous disease during pregnancy as well⁵. It is rarely encountered in the emergency department, occurring in about 0.2-1% of all stimulation cycles⁶.

Patients present with dyspnea, chest pain, abdominal pain, nausea, vomiting, diarrhea, abdominal distension and bloating. These symptoms are believed to be due to fluid shift into third spaces resulting in hydrothorax, ascites, edema and hypotension⁷. The exact mechanism of this remains controversial, but is thought to be triggered by exposure of hyper-stimulated ovaries to human chorionic gonadotropin resulting in the release of Interleukins, TNF- α , Endothelin-1 and VEGF resulting in increased vascular permeability⁸.

OHSS is classified as mild, moderate, or severe, based on clinical and laboratory criteria⁷.

The focus of emergency medicine management of OHSS is disease recognition, resuscitation, maintenance of hemodynamics and prevention/management of complications.

As assisted reproductive technology and the use of ovulation induction agents expands, we should expect to see more cases of OHSS in the Emergency Department. A detailed history and high index of suspicion in hemodynamically unstable females with chest pain, abdominal pain and shortness of breath post fertility treatment is key to timely diagnosis of this condition.

Also, POCUS is a critical tool in the Emergency Department for timely recognition and management of various disease processes as evidenced in this case using the RUSH protocol.

Declaration of Conflicts of Interest:

All authors declare no conflict of interest.

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