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Case Series

Intensive Care Management in Pregnant Women with Pulmonary Edema

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Abstract

Introduction: Pregnancy is a process in which the normal physiology of women changes completely. Difficult airway should not be ignored in these patients and anti-viral treatment should be start to prevent serious complications.

Aim of the Study: To share the airway management and pulmonary edema diagnosis and treatment process for pregnant patients.

Materials and Research Methods: Our study started after signing consent forms and approval of the ethics committee. Patient data were compiled from clinical records. Case 1: 40-year-old female patient with twin pregnancy with *in vitro* fertilization. She has cough, fever and general condition symptoms at the 32nd gestational week. Case 2: 22-week pregnant patient with dry cough, fever, high blood pressure, kidney failure and low platelet count. Case 3: 36-week pregnant patient with chronic immune thrombocytopenic purpura (ITP) was evaluated in the 2nd step intensive care unit with high fever and respiratory distress.

Conclusion: It should be remembered that serious complications such as pulmonary edema can be encountered and the mother and baby life will be saved with rapid diagnosis and correct treatment.

Keywords: *Pregnant; Difficult Airway, Pulmonary Edema*

Introduction

Pregnancy is a process in which the normal physiology of women changes completely. In response to progesterone, the nasopharynx and oropharynx become congested and hyperemic. This may result in an increase in Mallampati score and difficulty in intubation [1,2]. Changes are also seen in the anatomy. The lower ribs stretch outward and the ligaments relax in response to progesterone. This leads to a 50% extension of the subcostal angle. The anterior-posterior and transverse diameters of the chest increase, the diaphragm becomes convenient. Functional residual capacity decreases [3]. Changes in the respiratory system begin in the first trimester, peak at about 37 weeks of gestation, return to its normal pre-pregnancy state within 6 months after birth. Respiratory failure is the fifth leading cause of severe morbidity in pregnancy. One-third of intensive care unit applications are linked to pulmonary conditions, including pulmonary edema [4]. Systemic maternal viral infections can also affect pregnancy, and these can be particularly dangerous. Because pregnant women have higher virus-related morbidity and mortality than non-pregnant fellows [5]. Pulmonary edema associated with viral pneumonia is not uncommon. Approximately 1 in 1000 pregnancies are complicated by pulmonary edema and 47% are seen in the antepartum period, 14% in the intrapartum period and 39% in the postpartum period [1]. Oxygenation is compromised, maternal decompensation can occur quickly and fetal life is compromised.

In this study, we aimed to share the airway management and pulmonary edema diagnosis and treatment process for 3 pregnant patients whose clinical applications were different but similar clinical course received within 1 month.

Aim of the Study

To share the airway management and pulmonary edema diagnosis and treatment process for pregnant patients.

Materials and Research Methods

Patients who received consent forms and permissions from the ethics committee are presented below.

Case 1

A 40-year-old female patient with twin pregnancy with invitro fertilization in her history was accepted to the 2nd Stage Intensive Care Unit with cough, fever and general condition symptoms at the 32nd gestational week and oseltamivir 2 * 1 was started. On the third day of her admission, after worsening in general condition and a decrease in Glasgow Coma Scale (GCS) score she was taken to the 3rd stage intensive care unit. GCS: 13, consciousness was measured as somnol, oxygen saturation (SpO_2) 90% with oxygen at 4 l/min, fever: 39°C. Laboratory results were, WBC: 18000, PLT: 44000, LDH: 586, CRP: 180. Meropenem 3 * 1, vancomycin 2 * 1, clarithromycin 2 * 1 and fluconazole 2 * 1 were started with the knowledge of infectious diseases and obstetrics clinics. No radiographic imaging was possible because of pregnancy. Noninvasive ventilation (NIV) was applied to the patient whose breathing pattern was bad. Immediate intubation decision was taken upon the deterioration of consciousness and blood gas values. After two unsuccessful intubation experiences, emergency tracheostomy was planned for the patient, whose long-term sedation was not planned due to pregnancy. Cesarean operation (C/S) was performed the following day after platelet replacement. Pulmonary edema was observed in the postoperative thorax Computerised Tomography (CT). Complete sedation and furosemide infusion were applied. Mechanical anticoagulation was performed due to low platelet count. Valacyclovir 1000 mg 2 * 1 was started for the patient who developed peri-oral and nasal vesicular lesions. When the antibiogram results were negative, antibiotics were terminated on the 8th postoperative day. In terms of influenza, PCR results were reported as negative. On the 13th day of our follow-up, the patient's blood parameters and breathing improved, and he was taken to spontaneous breathing.

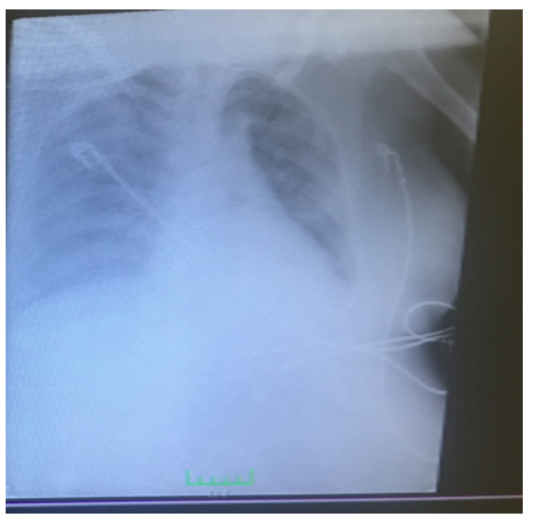

Figure 1: *Case 1: Chest graphy after C/S.*

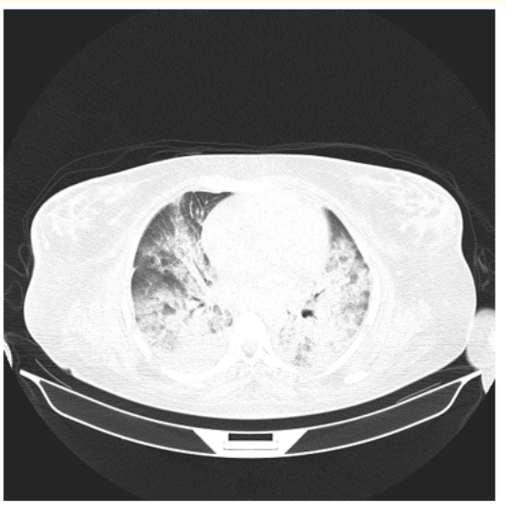

Figure 2: *Case 1: Thorax CT.*

Conclusion

Fever, dry cough complaints during admission, absence of antibiogram reproduction, and vesicular skin lesions in the following period suggested viral etiology. Tracheostomy was evaluated as the correct approach because of the intubation difficulty of the patient and the desire to avoid medication reason for pregnancy.

Case 2

A 22-week pregnant patient with dry cough, fever, high blood pressure, kidney failure and low platelet was accepted as extubated for intensive care. Respiratory sounds were poor in bilateral lungs, GCS 13 and SpO_2 were 92%. laboratory values were WBC: 17000, total bilirubin: 8.48, CRP: 108, plt: 42000, creatinine: 3.7. Imaging procedures were avoided and C/S was performed after platelet replacement. Mechanical anticoagulation was applied to the patient who was followed extubated in the postoperative intensive care unit. NIV was applied due to respiratory distress. The patient, whose blood gas follow-up was disturbed and his respiratory distress increased, was intubated after 1 unsuccessful attempt. Thorax CT was also seen to have pulmonary edema. Negative Antibiogram results, pulmonary edema and fever gave rise to thought viral pneumonia and oseltamivir treatment was started. N acetyl cysteine and furosemide infusion was started, followed by daily lung graphies and blood gas analysis. The patient, whose blood gas follow-up, consciousness and creatinine values improved, was extubated on the 8th postoperative day and transferred to the obstetrics clinic.

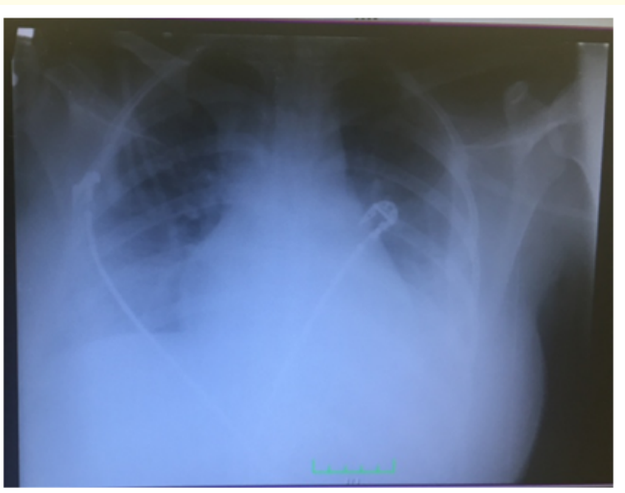

Figure 3: *Case 2: Chest graphy after C/S.*

Figure 4: *Case 2: Thorax CT.*

Conclusion

The patient's antibiogram results were negative and the current pulmonary edema table was associated with a viral etiology and hypertension.

Case 3

A 36-week pregnant patient with chronic immune thrombocytopenic purpura (ITP) was evaluated in the 2nd step intensive care unit with high fever and respiratory distress. GCS: 13 SpO_2: 89, fever 37.6 degrees, general condition was bad. Upon bad breathing sounds in the basal of lungs during auscultation, the 3rd step was taken to the intensive care unit. Clarithromycin 2 * 1, ampicillin sulbactam 2 * 1 were started, oseltamivir 2 * 1 continued. On the 2nd day of follow-up, C/S was performed after platelet replacement. Postoperative thorax CT was taken, followed by full sedation in intensive care unit. Furosemide infusion therapy was started for the patient, who was found to have pulmonary edema. On the 7th postoperative day the patient who was hemodynamically and clinically healed evaluated by daily blood gas and chest radiographs and then extubated. She was transferred to the gynecology clinic 2 days after extubation.

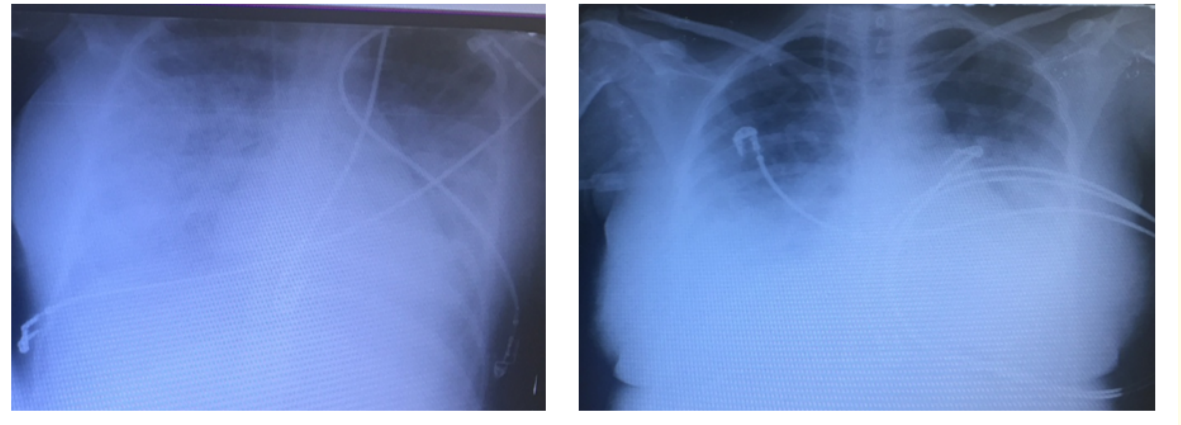

Figure 5 and 6: *Case 3: Chest graphy.*

Conclusion

In the patient who had high fever and respiratory distress at the time of admission, the negative results of antibiogram but positive pulmonary edema were interpreted in favor of a viral factor.

Discussion and Conclusion

A difficult and multidisciplinary approach is required in pregnant patients who are hospitalized in intensive care because of respiratory failure. Optimal management; Early diagnosis, hemodynamic stability, oxygenation and monitoring of the mother and baby. Necessary precautions should be taken by considering difficult intubation in obstetric patients. With the cases presented in this study, it was aimed to draw attention to the difficult airway in pregnant women, the importance of oxygenation and the etiology and treatment management of pulmonary edema.

The possibility of difficult airway in pregnant women should never be ignored. In all cases, difficult airway equipment should be available, and if necessary, tracheostomy should not be avoided, as we did in case 2. The most basic right to life for both mother and baby is to provide oxygenation.

Mortality rates and complications of viral infections are higher in pregnant women. However, the reason for increased sensitivity is not well defined [6]. Viral infections during pregnancy can affect fetal development and maternal deaths and is therefore a major clinical problem worldwide. Pregnant women with suspected viral infection should undergo empirical antiviral therapy because it reduces morbidity and mortality [7]. Oseltamivir was initiated in cases suggesting influenza, and the antibiogram results were found to be negative.

Pulmonary edema is a pathological condition in which extravascular fluid accumulates in the lung tissue [8]. Acute pulmonary edema is an important indicator of morbidity [9]. It is characterized by sudden onset of shortness of breath, agitation may accompany. As a matter of fact, in all cases presented, sudden onset and progressive dyspnea accompanying consciousness change is compatible with pulmonary edema. The goal of treatment is to improve oxygenation after diagnosis and treat the underlying primary cause of lung edema. Oxygenation can be achieved by nasal cannula, oxygen mask and, if necessary, by tracheal intubation and mechanical ventilation. However, continuous positive airway pressure should be applied primarily by non-invasive ventilation. In present cases, recovery in both consciousness and blood gas parameters using noninvasive ventilation support this information. Furosemide and morphine sulfate are considered the basis for the management of cardiogenic pulmonary edema in obstetric patients. Furosemide acts as a venodilator, alleviating intravascular volume overload [10]. After the diagnosis of pulmonary edema has been confirmed, dramatic improvement has been observed in existing cases undergoing full sedation with furosemide infusion and midazolam + tramadol infusion.

In our patients with respiratory distress, chest X-ray was not performed to protect the baby. However, the literature has shown that fetal radiation doses less than 50 mGy are not associated with fetal anomalies or loss [11]. If chest radiography was performed in patients, the diagnosis could be made faster.

As a result, intensive care follow-up should be performed in pregnant women presenting with fever, cough and respiratory distress. Difficult airway should not be ignored, preparation should be done. If a viral factor is considered, empirical antiviral therapy should be initiated without delay. It should be remembered that serious complications such as pulmonary edema can be encountered, and the mother and baby life will be saved with rapid diagnosis and correct treatment.

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