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Successful Management of Severe Preeclampsia with Acute Respiratory Distress Syndrome

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ABSTRACT

Acute respiratory distress syndrome (ARDS) is a serious condition occurring rarely during pregnancy and peripartum period. ARDS occurs either due to pregnancy associated risk factors or due to the increased risk during pregnancy. Clinical presentation, arterial blood gas, chest X-ray, and computerized tomography will help in the diagnosis of ARDS. Around 2% of patients require intensive care unit (ICU) admission during pregnancy or in the peripartum period. Mostly, these admissions are in the postpartum period. Fortunately, only 0.1%–0.2% of pregnant patients may have acute respiratory failure or ARDS necessitating invasive mechanical ventilation. We are reporting an unbooked case of G2P1L1 28 weeks period of gestation previous LSCS with severe preeclampsia, who came to OPD with complaints of headache. On examination patient was conscious, pallor present, bilateral grade III pedal edema present, PR 89 BP 190/100 mmhg, RR 16, SPO2 97% at room air. Systemic examination, CVS, RS, CNS normal, per abdominal examination, abdominal wall edema present, uterus corresponds to 24 weeks pog, relaxed, fetal heart sound good. All routine investigation were done – she had protienuria 3+, spot urine PCR 6.69 rest all investigation were normal. Emergency hysterotomy was done in view of severe IUGR with severe preeclampsia with absent end diastolic flow. a single live female baby of 620 gm extracted and shifted to NICU. Post operetaively her saturation was82%chest X-ray, HRCT, ABG, 2D ECHO was done and diagnosed as ARDS, patient shifted to ICU and managed conservatively. Overall morality from ARDS is showing decreasing trends, and the mortality during pregnancy and peripartum period is significantly lower than in general population. Prolonged ventilation, amniotic fluid embolism and organ failure increases the risk of death in ARDS patient in pregnancy and peripartum period.

Key Words *– ARDS, pregnancy, severe preeclampsia, hysterotomy.*

INTRODUCTION

Preeclampsia is a multifactorial condition characterized by new-onset hypertension and proteinuria, or hypertension associated with significant organic dysfunction after 20weeks of pregnancy. Acute pulmonary edema is considered a severe feature of pre-eclampsia and very rarely results in ARDS. Nearly 70% of the PE events occur in the postpartum period when plasma oncotic pressure is at its lowest (38–40) and there is fluid shift from the extravascular space restoring the intravascular volume, increasing the preload following the placental removal. Around 2% of patients require intensive care unit (ICU) admission, Fortunately, only 0.1%–0.2% of pregnant patients may have acute respiratory failure or ARDS necessitating invasive mechanical ventilation. Overall mortality from ARDS is showing decreasing trends, and the mortality during pregnancy and postpartum period is significantly lower than in general population.

CASE REPORT

We are reporting a case of G2P1L1 with 28 weeks period of gestation with severe preeclampsia. On examination patient was conscious, pallor present, bilateral grade 2 pitting pedal edema present, PR 89, BP 190/ 100 mmHg, RR 16/min, spo2 97% at room air, systemic examination CVS /RS / CNS normal, on per abdominal examination abdominal wall edema present, uterus corresponds to 24 weeks period of gestation, relaxed, fetal heart sound good. All routine investigation done – she had urine protein 3+, spot urine protein creatinine ratio of 6.69, rest all investigation were normal. Patient was induced with 2 doses of dinapros gel in view of severe preeclampsia with absent end diastolic flow. due persistent high BP recording with imminent signs emergency hysterotomy done, live female baby of 620 gm extracted and shifted to NICU.

On postoperative day 2 patient had spo2 of 82% with chest x ray showing bilateral lung infiltrates, ECG normal, 2D ECHO showed concentric LVH with mild MR, mild TR with bilateral pleural effusion with ejection fraction 60%, HRCT showed bilateral pleural effusion along major fissure with consolidatory collapse of bilateral basal segment, inferior segment. Provisional diagnosis of ARDS was made and patient shifted to intensive care unit in view of persistent tachypnea started on oxygen via nasal prongs, injection piperacillin and tazobactom, continued antihypertensive and advised proning. patient improved symptomatically. Baby has symptomatically improved after intensive neonatal care and is weighing 1.6 kg.

DISCUSSION

Acute respiratory distress syndrome is acute onset noncardiogenic pulmonary edema and hypoxemia caused by alveolar inflammation or infection. Preeclampsia is a multifactorial condition characterized by new-onset hypertension and proteinuria, or hypertension associated with significant organic dysfunction after 20weeks of pregnancy. physiopathology of preeclampsia relies on abnormal placentation and imperfect invasion of the uterine spiral arteries by cytotrophoblast cells, causing inadequate blood flow and relative placental ischemia. In consequence, a state of oxidative stress is established, leading to defective fetoplacental angiogenesis and endothelial dysfunction.

The endothelial dysfunction in preeclampsia is associated with an increase in both peripheral vascular resistance and vascular permeability, which ultimately results in a state of relative intravascular hypovolemia. The decrease in oncotic pressure secondary to preeclampsia-related hypoproteinemia, the disruption in pulmonary endothelium leading to increased capillary permeability, and the increase in afterload due to severe hypertension all appear to play a role. ARDS results from inflammation induced injury to the alveolar–capillary barrier. In the acute or exudative phase, this leads to flooding of the alveoli with high protein pulmonary edema and subsequent surfactant abnormalities and consolidation. Some cases resolve from this phase, which typically lasts 4–7 days, whereas others progress to developing fibrosis and organization in the fibroproliferative phase. After 1–2 wks, those cases that progressed may begin to resolve with clearance of the pulmonary edema and inflammatory cells and reconstitution of the alveolar–capillary barrier. Clinically, patients experience acute hypoxemic respiratory failure, often accompanied by dyspnea, tachypnea, and tachycardia.

Diffuse bibasilar crackles or wheezing can be appreciated on auscultation of the chest, and tachypnea and cyanosis may be present. The chest radiograph is usually significant for

bilateral diffuse alveolar and interstitial infiltrates, and differentiation from congestive heart failure or fluid overload may be difficult. Pulmonary hypertension and multiple organ dysfunction syndrome may also develop. As patients move into the resolution phase, there is gradual improvement in oxygenation, and most radiographic abnormalities resolve completely.

The current definition of ARDS was proposed by Bernard et al and the American–European Consensus Conference. The criteria included: 1) acute onset; 2) a PaO2 /FIO2 ratio, or hypoxia score, of <200, regardless of positive endexpiratory pressure; 3) bilateral infiltrates on chest radiograph; and 4) a pulmonary artery occlusion pressure of <18 mm Hg or the absence of clinical evidence of left atrial hypertension. Acute lung injury was given similar criteria but with less severe hypoxemia, defined as a PaO2 /FIO2 ratio of <300.

MANAGEMENT STRATEGY

Respiratory Support

Generally mechanical ventilation should be optimized to prevent volutrauma, barotrauma, atelectrauma. Lung protective strategies, should be followed which include lower tidal volume (6 ml/kg), increasing the respiratory rate to get a reasonable minute ventilation appropriate for the physiological changes in pregnancy as much as possible

Negative Fluid Balance

“The dry lungs are happy lungs.” As the pathological change in ARDS is the fluid accumulation in the interstitial tissues of the lung, by restricting fluid intake and keeping the fluid balance negative, patients will benefit from decreased lung water content.

Neuromuscular Blocking Agent

Neuromuscular blocking agents (NMBA) might improve the mechanical viscoelastic properties of the chest wall. Abolition in spontaneous ventilatory activity increases the total thoracopulmonary compliance because of the improved ventilator patient synchrony and a decrease in the expiratory muscular activity, which will have an oxygen sparing effects as well.

Prone Position

Ventilation in prone position improves oxygenation in all the patients by reopening the posterior dependent consolidated areas of the ARDS lungs. Up to 60% of patients show improvement in oxygenation after prone ventilation

Supportive Care

It includes sedation, pain control, hemodynamic support (vasopressors), monitoring of vital signs, adequate volume management, nutritional support, stress ulcer prophylaxis, and venous thromboembolism prophylaxis.

CONCLUSION

ARDS is one of the critical illnesses of pregnancy and postpartum period. In combination with the clinical parameters, imaging studies are needed to confirm the diagnosis of ARDS excluding the cardiogenic pulmonary oedema using advanced hemodynamic monitoring or echocardiography. In the management of ARDS, it is of vital importance to have optimized ventilator strategies with the limitation and control of the plateau pressure and accepting a higher partial pressure. To achieve this goal, proning of these patients and extracorporeal

oxygenation are accepted methods Finally, supportive care such as, nutrition, and deep venous thrombosis prophylaxis are important for the basic management.

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