Infection and acute respiratory distress syndrome during pregnancy: A case series of preventable maternal deaths from southern India

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Summary

Introduction: Acute respiratory distress syndrome (ARDS) is common among women admitted to obstetric intensive care units, and it contributes significantly, both directly and indirectly, to maternal deaths.
Case series: We present a case series of ARDS in pregnant women caused by non-obstetric causes. The women were treated at a tertiary hospital in southern India. The striking features were delayed referral from the primary care unit and the lack of a primary diagnosis or treatment. Undiagnosed rheumatic heart disease, anemia, and malaria and H1N1 epidemics contributed to these cases of ARDS and maternal death.
Conclusion: It is necessary to increase the awareness of evidence-based uniform protocols to tackle common medical complaints during pregnancy.

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Case series

Introduction

Acute respiratory distress syndrome (ARDS) is a common occurrence among pregnant women admitted to the intensive care unit, and ARDS due to non-obstetric causes is increasingly contributing to maternal/perinatal mortality. Pregnancy-induced physiological changes, such as increased susceptibility to infection, decreased chest...
compliance, decreased functional residual capacity, increased risk of aspiration, mucosal edema, and a decrease in arterial pCO₂, not only increase the susceptibility to ARDS but also make the management of ARDS difficult [1,2]. We present a series of five such cases and discuss how factors such as anemia, respiratory infections, H1N1, undiagnosed rheumatic heart disease, and malaria could result in an increased incidence of ARDS-related maternal mortality in developing countries such as India.

Cases

Case 1: The patient was 33 weeks pregnant and had been febrile for 1 week and dyspneic for 3 days at the time of referral. A chest X-ray and a throat swab for H1N1 revealed extensive H1N1 pneumonia with ARDS. The patient’s condition deteriorated despite treatment with oseltamivir and necessary supportive care, and she developed Klebsiella sepsis/multiorgan dysfunction. Her cardiorespiratory status precluded attempts to deliver the baby. The fetus died, followed by maternal death within 5 days of admission.

Case 2: The patient was 36 weeks pregnant and had experienced cough/dyspnea upon exertion for 5 weeks, for which she had not been evaluated despite attending regular antenatal care visits with a private obstetrician. Upon admission to our referral center, a provisional diagnosis of atypical pneumonia was made by physicians, and antibiotics were started. Her hypoxemia worsened. A chest X-ray taken at this stage revealed severe ARDS. An emergency cesarean was performed. The patient had a prolonged stay in the intensive care unit (ICU), during which she was on mechanical ventilation, without any improvement. Interstitial lung disease was suspected based on a strong family history, suggestive chest X-ray findings, and a corroborative autoimmune profile. High-dose prednisolone was tried without success. She developed fungemia and died.

Case 3: A patient who was multigravida at 21 weeks had visited a private hospital with a fever lasting 1 week, for which she was prescribed paracetamol, and no investigations were performed. She presented to our institution when the fever did not subside, and she developed cough and dyspnea. The diagnosis was typhoid fever with early ARDS. She responded well to treatment and recovered in 3 days.

Case 4: The patient, who was primigravida at 22 weeks, presented with fever and dyspnea lasting 5 days. She was a late booker and had attended only one antenatal check-up at a district-level community health center a few weeks earlier, at which time she was prescribed iron tablets for anemia. Upon admission, she had sepsis and bilateral pneumonia/severe ARDS. In addition, there were features of congestive cardiac failure. Echocardiography revealed critical mitral stenosis and pulmonary arterial hypertension. She worsened before a balloon mitral valvotomy could be attempted and died despite maximum supportive measures.

Case 5: The patient, who was multigravida at 20 weeks, presented with fever/chills lasting 8 days and jaundice and dyspnea lasting 3 days. She has previously been prescribed antibiotics at a private hospital for a presumed respiratory infection. The diagnosis was falciparum malaria and early ARDS (Fig. 1). Her cardiorespiratory condition and ARDS worsened, although her parasitemia, anemia, and jaundice improved with antimalarial therapy. Due to severe financial constraints, she was taken home in a moribund state against advice.

Discussion

In our patient series, the late recognition of infection, either primary respiratory or systemic, and delayed referral were major causes of ARDS and maternal mortality. Unrecognized preexisting cardiorespiratory illnesses, as in cases 2 and 4, worsened the prognosis [2]. The H1N1-related death suggests the lack of implementation of public health measures, such as vaccination during pregnancy, exposure prevention, and the early commencement of therapy. Fever must be evaluated at an early stage in pregnant women. ARDS
is one of the known complications of untreated malaria [3], but ARDS is a rare complication of typhoid fever. Early antimalarial therapy would have been life saving in our case.

The most common initial ARDS symptom is dyspnea [4]. The complaint of dyspnea was overlooked for 5 weeks in one of our patients (case 2), most likely based on an assumption that the dyspnea was physiological. Any patient with dyspnea affecting exercise tolerance or associated with other symptoms/signs of cardiopulmonary disease requires careful evaluation. The reluctance to perform chest X-rays during pregnancy, as observed in our own center, should be avoided.

ARDS-related maternal mortality ranges from 9 to 44%, and perinatal mortality ranges from 20 to 30% [5]. However, sepsis/multiorgan failure, ventilation-associated problems, ICU-acquired infections and severe financial constraints altered the course of the disease and contributed to poor outcomes in these cases. The majority of pregnant women in developing countries do not have access to ICU facilities or expensive medications, and therefore, preventive care at the primary care level is even more important.

The small number of trained medical practitioners, the lack of basic facilities for investigation, and delayed referral due to the lack of transport facilities lead to most of the preventable maternal deaths in the developing world. In contrast, in this series, all of the patients were initially evaluated at smaller hospitals (private/community-level health centers) by qualified obstetricians with access to facilities to perform basic blood tests, such as blood cell counts and tests for malaria and typhoid, and chest X-rays. However, a major problem in countries such as India is that the provision of health care is not based on a uniformly standardized and evidence-based protocol. Instead, the provision of care is based on the knowledge, competence and decisions of individual practitioners, which are obviously highly variable. Periodic updating and the regular monitoring of adherence to health care delivery protocols are important tools but are very difficult to implement in diverse health care systems, such as in India.

Conclusion

As the number of maternal deaths due to direct obstetric causes decline, effectively tackling medical illnesses becomes important to reduce maternal mortality. Simple, evidence-based protocols regarding how to tackle common medical complaints during pregnancy, such as fever and dyspnea, must be developed. These protocols must outline the basic steps for evaluation and management at the primary care level. A uniform antenatal checklist may help to identify preexisting cardiorespiratory illnesses. Clear indications and pathways for early referral should be outlined. Monitoring the adherence to such a protocol is equally difficult because there is no uniformity in health care delivery in most developing countries. Regularly attending events that provide information about medical advances must be made mandatory for medical practitioners. Antenatal clinics must have posters explaining dangerous symptoms, including medical complaints, and obstetric emergencies.

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Ethical approval

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References