



## Acute Respiratory Distress in Pregnancy: A Case Report of a Prevented Maternal Death in a Tertiary Hospital in Akure, South West Nigeria

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### Abstract

**Background:** Acute respiratory distress in pregnancy is a life-threatening condition which contributes significantly directly or indirectly to maternal death.

**Case reported:** This was that of a 20-year old G1P0+0 who presented with sudden onset of difficulty with breathing with no associated fever, neither cough nor chest tightness at a gestational age of 34weeks+4days having been referred from a private facility where she has had antibiotics and was nebulized without any success. She was not a known asthmatic and laboratory and radiological investigations carried out did not reveal any pathological cause. She was managed as a case of acute respiratory distress due to diaphragmatic compression and was subsequently delivered of a live male neonate who weighed 2.4kg and with good Apgar scores. Mother continued to improve following delivery and was discharged home on the 5th day of admission.

**Conclusion:** Acute respiratory distress in pregnancy can be due to hormonal changes in pregnancy coupled with diaphragmatic compression from the gravid uterus as the pregnancy advances. A high index of suspicion is required after ruling out pathological causes, this should be followed by immediate delivery to prevent maternal death.

**Keywords:** Acute Respiratory Distress, Pregnancy, Successful Outcome

## INTRODUCTION

Pregnancy causes changes in respiratory physiology such as increase in tidal volume and minute ventilation with the respiratory rate remaining unchanged [1]. However, patients with acute respiratory distress may present with dyspnoea, confusion, agitation and/ or cyanosis depending on the causative factors [2]. Such patients breathe more rapidly and shallowly and may be found to be using their accessory muscles of respiration than those not in acute respiratory distress [2]. Acute respiratory distress is a rare complication of pregnancy affecting 0.1 to 0.2 percent of pregnancies [3] and if it does occur it may be a cause of perinatal and maternal mortality if prompt attention is not taken to save both the baby and the mother's lives [4].

As pregnancy advances, there is a diaphragmatic elevation which often leads to displacement of the heart upwards and to the left and this can lead to changes in electrocardiogram (ECG) during pregnancy [5]. Similarly, aorto-caval compression by the gravid uterus can cause profound hypotension. Pregnancy also causes alterations in maternal respiratory physiology as a result of the increase in the hormonal and biochemical effects on the respiratory centre causing local effects on the respiratory smooth muscle. The circulating progesterone stimulates the respiratory centre causing an increase in the minute ventilation by increasing the tidal volume [5].

The presence of the gravid uterus can also have a splinting effect on the diaphragm. This is initially compensated for by increases in the transverse and anterior-posterior diameters of the chest, usually facilitated by an increased ligamentous laxity which allows the flaring of the lower rib cage. Though, inspiration remains largely a function of

diaphragmatic movement but by term, functional residual capacity (FRC) is reduced by approximately 20% [5]. Nevertheless, pathological causes of acute respiratory distress such as malaria, lobar pneumonia and allergic conditions such as asthmatic attack must be ruled out in the management of pregnant women with acute respiratory distress both clinically and radiologically [6]. Clinical signs suggestive of any of these conditions may include presence of crepitations, rhonchi and/ or wheezes [7].

This case presented with acute respiratory distress without any underlying infective process nor allergic condition both clinically and radiologically and was managed successfully by having a high index of suspicion that the acute respiratory distress was due to a splinting effect on the diaphragm and prompt delivery of the baby was commenced to reduce the diaphragmatic compression caused by the gravid uterus.

## CASE REPORT

It was a case of a 20-year old G<sub>1</sub>P<sub>0</sub><sup>+0</sup> who was referred from a private facility on account of sudden onset of difficulty with breathing of 6 hours prior to presentation on the 7<sup>th</sup> of April 2023 at a gestational age of 34 weeks +4 days. She was not a known asthmatic and never had similar episode in the past. There was no associated fever or chest tightness. There was no cough, no excessive sweating at night, nil orthopnoea nor leg swelling and no known allergy. There was no redness of the eyes, no recurrent sneezing or running nose. There was no abdominal pain, no drainage of liquor nor bleeding per vagina. She was not a known sickle cell disease patient as her genotype was said to be AA. She had never smoked cigarettes or taking alcohol before. She was married in a monogamous family setting to a 23-year old contractor. She had earlier presented at the referral hospital where she was nebulized and placed on Aminophylline and parenteral antibiotics without any effect which necessitated her referral.

At presentation, we found a young lady who was in severe respiratory distress as evidenced by the flaring of the alai nasal SPO<sub>2</sub> was 88%, she was not febrile temperature was 36.6<sup>0</sup>C, not jaundiced, not pale, not cyanosed and had no pedal oedema. Chest findings showed she had a respiratory rate of 42 cycles/minute; there were no crepitations nor rhonchi. Cardiovascular examination showed a pulse rate of 103 beats/minute and a blood pressure of 86/74 mmHg and no murmurs. Abdominal examination showed a gravid uterus with symphysio-fundal height of 34 cm, no area of tenderness, the liver, spleen and kidneys were not palpable, fetus was presenting cephalic in a longitudinal and right occipito- anterior position with a heart rate of 132 beats/minute. There was no palpable uterine contraction. The vaginal examination showed a closed cervical os, posterior, uneffaced, firm in consistency, at station 0 -3 with intact membranes.

An assessment of third trimester acute respiratory distress due to diaphragmatic compression from the gravid uterus with aortocaval hypotension was made. She was admitted and nursed in cardiac position and was commenced on intranasal oxygen at the rate of 6 litres/minute. Urgent investigations carried out included full blood count which showed a packed cell volume of 33% and white cell count of 4,000 cubic millilitre, Chest X-ray with abdominal shield which was essentially normal except for diaphragmatic elevation as evidenced by an increase in the antero-posterior diameter, HIV screening which was non-reactive, hepatitis B surface antigen screening which was non-reactive and blood film for malaria parasites which was negative.

She was placed on intravenous fluids using normal saline which was alternated with 5% dextrose saline, parenteral antibiotics using ceftriaxone and was continued on the intranasal oxygen. A review later showed that the blood pressure had risen to 100/60 mmHg while in cardiac position and the pulse rate had reduced to 78 beats/minute while the respiratory rate had dropped to 22 cycles/minute. She had a pint of blood grouped and cross matched and was worked up for induction of labour. Labour was induced on the 10<sup>th</sup> of April 2023 with intracervical foley's catheter and later augmented with oxytocin; she progressed and delivered a live male neonate with good Apgar score and a birth weight of 2.4 kg. She remained stable and was discharged home on the 11<sup>th</sup> of April 2023.

## DISCUSSION

A case of acute respiratory distress in a primigravida in the third trimester of pregnancy secondary to diaphragmatic compression who had successful vaginal delivery and a full recovery from the respiratory distress has been presented. Maternal and perinatal mortalities were prevented following prompt intervention to nurse in cardiac position coupled with the commencement of intranasal oxygen and prompt delivery.

Acute respiratory distress syndrome (ARDS) is a common occurrence among pregnant women as a result of pregnancy induced physiological changes leading to increased susceptibility to infection, decreased chest compliance, decreased functional residual capacity, increased risk of aspiration, mucosal oedema, and a decrease in arterial pCO<sub>2</sub> thus making its management difficult [1,7]. A high index of suspicion is therefore necessary to prevent maternal and perinatal morbidities and mortalities associated with it.

In a series of related cases of acute respiratory distress syndrome in pregnancy presented by Akhila Vasudeva et al in India, the typical symptoms presented by the women were fever followed by difficulty with breathing which suggested pathological causes in these groups of women [8]. This showed that acute respiratory distress syndrome presenting in pregnancy should also be investigated for infective causes as was done for this patient and should not be ascribed to only physiological causes. It can then be streamlined to physiological cause if clinical, biochemical and radiological findings are not in keeping with any infective cause. Even while managing physiological cause of acute respiratory distress in pregnancy, it is not out of place to consider placing the patient on parenteral antibiotics because of their increased susceptibility to infection [1]. This patient was placed on antibiotics to prevent secondary bacterial infection and she was immediately delivered when she became stable to avoid a recurrence. These all contributed to the successful outcome for both the mother and the baby.

## CONCLUSION

Acute respiratory distress in pregnancy is common as a result of the hormonal changes that occur in pregnancy and this can lead to perinatal and maternal morbidities and mortalities if no prompt attention is given. The presence of a gravid uterus also causes splinting of the diaphragm and can further worsen the acute respiratory distress. The case presented had acute respiratory distress from diaphragmatic compression which may continue as the pregnancy advances, this necessitated the immediate delivery to save the mother and the baby.

## ETHICAL APPROVAL

Not needed.

## CONFLICTS OF INTEREST

None declared.

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### CITE AS

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