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CASE REPORT

Successful use of streptokinase for the treatment of empyema thoracis during advanced pregnancy: A case report

Samuel Nir [a], Lalazar Gadi [a,*], Shuvy Mony [a], Mizrahi Meir [a], Granados Jaime [a], Elami Amir [c], Izhar Uzi [c], Liebowitz Gil [a], Ilan Yaron [a], Berkman Neville [a,b]

[a] *Department of Medicine, Hadassah Hebrew University Medical Center, Jerusalem, Israel*
[b] *Institute of Pulmonology, Hadassah Hebrew University Medical Center, Jerusalem, Israel*
[c] *Department of Cardiothoracic surgery, Hadassah Hebrew University Medical Center, Jerusalem, Israel*

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Summary
Pneumonia complicates as many as 2.7 in every 1000 pregnancies putting both mother and fetus at increased risk. Parapneumonic pleural effusion is generally managed by thoracocentesis and, if ''complicated'', by tube thoracostomy. If conservative management is unsuccessful, surgical decortication may be necessary. We report the case of a 24 year old gravida, who at 33 weeks of gestation presented to the emergency department with right sided pneumonia complicated by empyema. Blood and pleural fluid cultures were positive for Streptococcus pneumonia. Treatment with antibiotics, tube thoracsotomy and interpleural streptokinase led to resolution of the pneumonia and empyema without the need for surgical intervention. The patient carried her pregnancy to term and delivered a healthy baby after 39 weeks and 5 days of gestation. To our knowledge this is the first report of empyema treated with streptokinase in advanced pregnancy.

Introduction

Pneumonia complicates 0.78–2.7 per 1000 pregnancies, putting both gravida and fetus at increased risks. Compared with pneumonia in a non-pregnant adult, the gravida faces an increased risk of bacteremia, empyema, need for mechanical ventilation and other less common complications. The main risks for the fetus are preterm labor and

Abbreviations: VATS, Video assisted thoracoscopic surgery; ACCP, American college of chest physicians.

* Correspondence to: Gadi Lalazar MD, Department of Medicine, Hadassah Hebrew University Medical Center, Ein-Kerem, POB 12000, Jerusalem, Israel, 91120. Tel.: +972 2 6778511; fax: +972 2 6420338.
E-mail addresses: lalazar@hadassah.org.il, ilan@hadassah.org.il (L. Gadi).

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preterm birth with low birth weight and subsequent associated infant morbidity and mortality.[1] *Streptococcus pneumoniae* is the most common pathogen implicated in community acquired pneumonia during pregnancy.[2]

Streptokinase is a fibrinolytic agent used for a variety of conditions including the treatment of ''complicated'' parapneumonic pleural effusion. The efficacy of intrapleural streptokinase, its benefit over tube thoracostomy alone, and its potential for obviating the need for surgical intervention has recently been put into question, although the issue remains contraversial.[3,4] To our knowledge this is the first report of empyema treated with streptokinase in advanced pregnancy.

Case

A 24 year old, 33 week pregnant woman reported to the emergency department with a three day history of fever of 38.5 °C and weakness. One day prior to admission, she developed worsening dyspnea, a non productive cough and pain in the posterior right thorax. She was examined at a community clinic where she received intra-venous fluids and was offered antibiotic treatment, for suspected pneumonia, which she refused. She had no prior medical conditions and had 3 previous uneventful pregnancies.

On admission the patient appeared pale, dyspneic and was in considerable distress.

The respiratory rate was 45 breaths per minute with an oxygen saturation of 95% while breathing room air. Use of accessory muscles of respiration was noted. Her temperature was 37.3 °C, heart rate 123 beats per minute and her blood pressure 104/46 mmHg. Examination of the right chest revealed diminished breath sounds, decreased vocal fremitus and dullness to percussion. The abdomen was soft with a prominent uterus appropriate for the gestational week. Laboratory values showed mild hyponatremia of 132 mMol/l (135—145) and mild hypokalemia of 3.2 mMol/l (3.5—5). Blood count showed leukocyte count of 6900/mm^3 (4000—10,000), mild anemia with hemoglobin 10.7 gr/dL[11—15] and a platelet count of 186,000/mm^3 (150,000—400,000) Urinalysis, renal and liver functions were all within the normal range. Chest x-ray showed a right lower lobe infiltrate and suspected fluid. A chest sonogram done in the emergency department showed right lower lobe consolidation and no fluid. EKG showed sinus tachycardia without signs of right ventricular strain. Fetal monitoring and sonography on admission were reassuring.

The patient was hospitalized and started treatment with intravenous Cefuroxime (750 mg TID) and oral Roxythromycin (150 mg BID). Oral Tramadol HCl and Dipyrone were administered for pleuritic pain. The status of the fetus was monitored daily by an obstetrician and remained reassuring. On the day after admission, the patient experienced subjective improvement but findings on physical examination and chest radiography were compatible with accumulating fluid in the right thorax (Fig. 1A). Oxygen saturation decreased to 93% on room air. Repeat chest sonogram showed pleural fluid and pleural aspiration was used to drain 60 ml of frank pus, with a leukocyte count of 50,000/mm^3 with 97% neutrophils A thoracostomy tube was inserted and an additional 800 ml of purulent fluid were drained (Fig. 1B). Due to the impression of residual fluid on physical examination and repeat chest radiography and the lack of additional drainage from the initial thoracostomy tube, a second tube was inserted. On hospital day 3 blood cultures grew *S. pneumoniae*, and antibiotic treatment was switched to intravenous penicillin (4 million units every 6 h). However, the patient failed to show evidence of clinical improvement with persistent dyspnea and low grade fever. While there was no leukocytosis, the platelet count continued to increase to a maximal value of 635,000/mm^3. Physical examination and radiographic studies showed a significant amount of residual loculated fluid in the right hemi-thorax (Fig. 1C). Following pulmonary and thoracic surgical consultation, it was decided not to perform surgical decortication at that time, and on hospital day 7, treatment with streptokinase was initiated (250,000 units every 8 h administered through the thoracostomy tube, total 9 doses over 72 h). Following the administration of streptokinase a notable increase in the amount of fluid drained was observed and the patient reported improvement in her well being. Chest x-ray showed improvement from the previous radiographs with smaller amounts of fluid. The patient improved continuously and on hospital day 13 the chest tubes were removed. A repeat chest radiograph 24 h later did not show re-accumulation of fluid. On hospital day 14, the patient was discharged with treatment of oral penicillin (500 mg every 6 h) for an additional 14 days. Chest x-ray done on the day of discharge showed marked improvement (Fig. 1D).

The patient carried her pregnancy to term and went into spontaneous labor after 39 weeks and 5 days of gestation. A healthy female infant was delivered vaginally, weighing 3100 g with Apgar scores of 9 and 10 at 1 and 5 min respectively.

A follow up chest x-ray done 5 months after her discharge showed minimal residual pleural thickening in the right costophrenic angle (Fig. 1E).

Discussion

When caring for the acutely ill gravida, the clinician is challenged by increased risks of morbidity and mortality to the patient together with the need to minimize risk to the fetus. Applying the ethical axiom that the gravida's treatment must not be compromised by obstetric considerations may be challenging to apply in light of the patient's wishes and the different views of the treating physicians.

Pneumonia during pregnancy poses significantly increased risks to both gravida and fetus. Although its incidence appears to vary due to demographic and epidemiologic trends[2] pneumonia during pregnancy has been cited as the chief non-obstetric infectious cause of death.[5] The gravida's condition may be complicated by bacteremia in up to 16% of the cases, empyema in 8% and an increased rate of mechanical ventilation.[1] The fetus is faced with an increased risk of placental abruption,[6] preterm birth, low birth weight and subsequent morbidity and mortality.[1] Although recent studies suggest that community acquired pneumonia in a young and otherwise healthy gravida is generally well tolerated by both mother and fetus,[7] the risks mentioned above should not be overlooked.