Varicella Pneumonia at Parturition; A Non-Fatal Case Report

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An 18-year-old woman with varicella pneumonia at 32-weeks gestation was delivered of a viable female infant. Both mother and child did well post partum. Varicella pneumonia in pregnancy has been reported to have a 41 percent maternal mortality, and a 65 percent fetal and neonatal mortality. The only proven therapy is oxygen and ventilatory support. The therapeutic benefits of steroids, antibiotics, and gamma globulin continue to be controversial.

Varicella in the pediatric population is usually a benign, self-limited disease that is neither threatening to life nor associated with lasting sequelae. In adults, the disease is frequently more fulminant and is occasionally associated with pulmonary involvement by the varicella infection. Pregnant patients who develop varicella pneumonia are thought to have a higher mortality than the general adult population with this complication.

Case Report

The patient was an 18-year-old, gravida I para O, white woman at approximately 32-weeks gestation who presented to the hospital on February 14, 1975, with a 30-hour history of increasing dyspnea, chest pain, and cough. Gross hemoptysis developed over the last six hours prior to admission. Skin lesions of varicella were first noted three days prior to her hospitalization and she was exposed to a child with varicella approximately two weeks before admission.

She was in severe respiratory distress with cough productive of copious red sputum. Temperature was 101.2 F, pulse 160 beats per minute, and respirations 44/min. Crusted and vesicular lesions were present over her face, trunk, and extremities. Tubular breath sounds were heard at the hilum but the lungs were otherwise clear. Her uterus was consistent with a 32-week pregnancy and fetal heart tones were audible at 184/min.

Laboratory evaluation revealed a hemoglobin value of 12.9 gm/100ml, a hematocrit reading of 36.7 percent, a white blood cell count of 11,700/cu mm, and a differential with 55 percent segmented neutrophils, 27 percent band cells, 11 percent lymphocytes and 4 percent monocytes. Initial arterial blood gases on face mask at 10 liters of oxygen per minute were arterial oxygen pressure 57.7 mm Hg, arterial carbon dioxide pressure 22.9 mm Hg, pH 7.47, HCO_3 16.3. Chest x-ray (Figure 1) showed a patchy alveolar infiltrate throughout both lung fields. Sputum culture #1 grew *Enterobacter cloacae*, but cultures #2 and #3 were reported to be normal flora.

She was admitted to the Intensive Care Unit where she was given oxygen therapy and intravenous fluids. No antibiotics or corticosteroids were given during her hospitalization. Approximately 12 hours after admission she went into spontaneous labor and was delivered by breech extraction of a 4 lb 13 oz living female infant. Following delivery her respiratory status steadily improved, and by day six of hospital stay her lesions were clearing and she was without pulmonary symptoms.

The infant was judged to be 33 to 34 weeks by Dubowitz criteria[1] and experienced no neonatal rash or respiratory distress. Because she was at risk of developing neonatal varicella, the child was treated with 1.0 cc IM of Zoster immune globulin, an investigational agent obtained from the Communicable Disease Center. The child also received gamma globulin 1.2 cc IM. She developed a transient physiologic jaundice, but otherwise did well without signs of varicella.

Complement fixation antibodies drawn from the mother on the day of admission revealed the titer of varicella-zoster to be 1/8 and herpes simplex to be 1/32. Serum drawn from the mother four weeks later was recorded as varicella-zoster $\geq$ 1/256 and herpes simplex $\geq$ 1/256.

Discussion

Between 1942 and 1967, 253 cases of varicella pneumonia in adults were reported.[2] Seventeen of those patients were pregnant at the time of diagnosis. Of those 17, seven died (mortality rate of 41 percent). Among the remaining 236 non-pregnant patients, the mortality rate was only 11.4 percent. It has not been determined whether pregnancy predisposes a patient with varicella to the development of viral pneumonia. The above figures do suggest that those patients with varicella pneumonia who are pregnant have a greater risk of dying from the disease than those who are not. It has been speculated that this higher mortality results from a mechanical interference by the enlarged uterus with ventilation and coughing. Varicella pneumonia has also been associated with a high incidence of fetal wastage and prematurity. Of the 17 reported cases, there were eight fetal deaths, four premature births, four normal infants and one unknown.[3] Of those infants born alive, three died in the neonatal period. Two infants from the 17 pregnancies developed neonatal varicella and both survived. Only three infants escaped complications.

After a review of 253 cases of adult varicella pneumonia, Triebwasser estimated the incidence of this complication in adult varicella at approximately 14 percent.[2] A typical case presents with fever and a papulovesicular skin rash followed by onset of cough,

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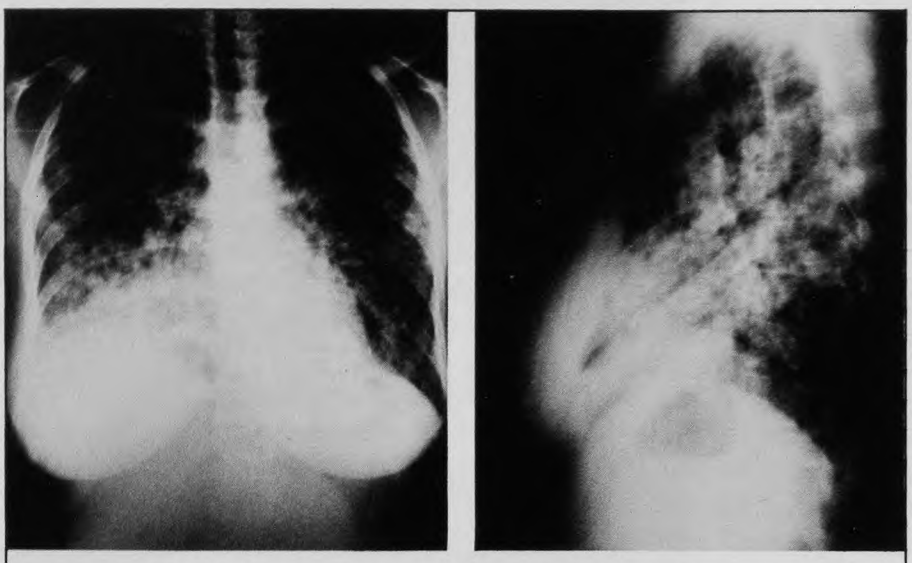

Figure 1. Left (PA view) and right (Lateral view): Admission film showing diffuse patchy alveolar infiltrate.

dyspnea, chest pain, and hemoptysis. Examination of the chest is often unremarkable and correlates poorly with the severity of the pneumonia. Peribronchial nodular infiltrates are the most common radiologic abnormality.

The primary goal of therapy in varicella pneumonia is directed at maintaining an adequate arterial oxygen pressure. Several different types of appliances may be used to deliver oxygen, but for satisfactory utilization they should not further irritate lesions on the skin. Intubation and mechanical ventilation have been used successfully in the management of severe hypoxia associated with varicella pneumonia.[4] Prophylactic gamma globulin has not been shown to be effective in altering the course of the disease once the rash has appeared. Gamma globulin taken soon after exposure may be beneficial in mitigating the severity of the infection.[3,5,6] Antibiotics were once thought to be helpful as initial treatment, but now it is believed that they should be withheld until there is evidence of a bacterial infection.[5,7] Adrenocortical steroids have been used in the treatment of varicella pneumonia, but there is no good data to support their potential benefit.[2,5,8]

In 1972 Glick reported on the occurrence of pulmonary embolism and infarction in the clinical setting of varicella pneumonia.[9] Once the diagnosis of pulmonary embolism has been confirmed by pulmonary angiography, anticoagulation could be of benefit in preventing further thrombosis and embolism.

Varicella pneumonia during pregnancy presents special problems for the fetus. In 17 cases of varicella pneumonia in pregnancy reviewed by Harris,[3] 11 resulted in death to the fetus or neonate. This is felt to have been due to maternal hypoxia and to the occurrence of premature labor and expulsion of the fetus.

The development of congenital varicella is always a potential threat to the neonate born to a mother with varicella at the time of delivery. In a report by Meyers from the Communicable Disease Center in February 1974, it was determined that those neonates with varicella who were most at risk of having a severe illness were those born within four days after onset of rash in the mother or those infants who developed the rash between five and ten days of life.[10] It has been speculated that this occurs because of the lag between the onset of rash in the mother and the appearance of antibody in cord blood. Neonates who are born with or develop a rash within the first four days of life are felt to have acquired the infection and some degree of maternal humoral protection transplacentally. Their clinical course is therefore more benign than those who develop a rash between days five and ten.

In Meyers' report of 46 cases of varicella within the last 17 days of term pregnancy, only 11 infants or 24 percent of the total developed varicella within the first ten days of life. The same report cited four neonatal deaths among 41 infants with congenital varicella. All four infant fatalities were in the neonatal group in which the rash developed between days five and ten of life or in the group whose mothers developed a rash less than five days before delivery.

Treatment for the infant who is at risk of developing neonatal varicella is still controversial. Gamma globulin is not effective in preventing varicella in normal children, although doses in the range of 0.3 to 0.5 ml/lb have been shown to mitigate the severity of the illness.[10] Zoster immune globulin has been reported to be effective in preventing varicella in normal children although it continues to be an investigational drug.

Conclusion

Varicella pneumonia is an uncommon and occasionally fatal complication of adult chicken pox. The mortality and fetal wastage among pregnant patients with this disease is especially high. The major treatment consists of oxygen and ventilatory support. Other modalities of therapy such as gamma globulin, steroids, and antibiotics have been advocated, but their use continues to be controversial.

References

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