CASE REPORT

# Fatal RSV Pneumonia in Elderly African American Female

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Abstract

Respiratory Syncytial Virus (RSV) pneumonia is relatively rare disease in adults and its incidence and impact among elderly population in the community is under-recognized. We hereby present a case of fatal RSV pneumonia in elderly African American female with history of diabetes mellitus type - 2 and hypertension.

Key Words

RSV, Pneumonia

## Introduction

RSV is relatively rare cause of respiratory illnesses. The incidence and impact of RSV infection among elderly population in the community, however, remains under recognized. Hence the fatal RSV Pneumonia in one of the elderly African-American female is being reported.

## Case Report

75-year-old African American female with history of hypertension and diabetes mellitus type-2 presented to University Hospital with progressive weakness, shortness of breath, slightly productive cough and fever for 7 days. She was on Insulin and Norvasc and her diabetes and hypertension were relatively well controlled. She denied any allergy to medications, and did not have a history of smoking, alcohol or illicit drug abuse.

On physical examination patient was restless, in significant respiratory distress, temperature -101.5$^0$F blood pressure-105/67 mmHg, heart rate-98 bpm, respiratory rate-34 per minute, hemoglobin saturation-88% on 60% FiO2 given with aerosol mask. She had dry mucosal membranes, decreased skin turgor and bilateral crackles and rhonchi on chest auscultation. The rest of the examination was normal.

Laboratory and radiological data did reveal WBC-13000/mm$^3$ (Neutrophils-79, Lymphocytes-1, Monocytes-12, E-8), Hemoglobin - 9.2gm Hematocrit - 28, platelets - 289, BUN-21, Cr-1.1, Glucose-239mg, electrolytes and LFT-s normal, urinalysis - negative for WBC, RBC and nitrite. Blood and sputum cultures came negative. Chest x-ray showed: patchy opacities in the lung fields bilaterally, more on the right side than left (Fig 1).

Patient rapidly developed respiratory failure, was intubated and connected to mechanical ventilator. She was started on Piperacillin/Tazobactam and Levofloxacin and admitted to ICU. She did not respond to antibiotic treatment well, the WBC increased to 25,000/mm$^3$, Levophed was required for BP support, hemoglobin saturation dropped to 89% on 80% FIO2 and she developed acute renal failure. Activated protein C was given. Chest x-ray now showed worsening of bilateral infiltrates (Fig 2).

Bronchoscopy with BAL was performed and sent for bacterial, fungal, AFB cultures and cytology. All results came negative. Antibiotics were changed to imipenem/cilastatin, vancomycin and levofloxacin. Several additional tests were performed, CT scan of the chest showed

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bilateral infiltrates, no empyema, cavitary lesions or abscesses were identified. CD4 was 62 but HIV ELISA came negative. Legionela urine antigen, mycoplasma IgG/IgM, chlamydia IgG/IgM, induced sputum for PCP and nocardia and rapid test for influenza antigen were negative. Finally nasal and pharyngeal swabs were sent for RSV antigen, which showed positive results. Patient's condition deteriorated rapidly and she died after two days the diagnosis was made.

Fig 1. X-ray chest showing patchy opacities in both the lungs

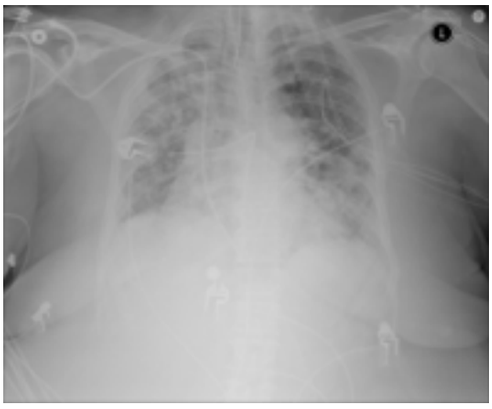

Fig 2. X-ray chest showing worsening of bilateral infiltrates.

## Discussion

In contrast to children, RSV is a relatively rare disease in adults. Nevertheless it can cause significant morbidity and mortality among elderly people, especially persons with chronic underlying diseases and immuno compromised hosts.

RSV is not an uncommon cause of respiratory illnesses in nursing home residents. Several studies and outbreak reports of RSV in long term care facilities showed significant number of incidence (3-40%), morbidity (pneumonia developed in 10-55%) and mortality (range: 0-53%) (1).

The incidence and impact of RSV infection among elderly population in the community is underrecognized. Case reports are available, describing RSV in adults with chronic medical conditions as well as previously healthy elderly people (2-5).

The prospective study of viral respiratory illnesses among elderly persons, which followed 533 persons during the two-year period, found RSV to be involved in 3% of all 497 URI episodes (6).

RSV is a well known and widely described as a significant cause of morbidity and mortality in immunocompromised adults, particularly in people with leukemia, chemotherapy receivers, solid organ and especially bone marrow transplant (BMT) recipients. One study showed RSV as a cause of 49% of total of 67 viral isolates in BMT patients (7). Patients prior to marrow engraftment are associated with the worst prognosis, pneumonia develops in 80%, and mortality reaches 70 to 80% in those who develop pneumonia. Severe diseases of RSV in HIV + individuals have also been described (8).

RSV can spread nosocomially. Outbreaks of RSV have been documented in the hospitals among nonimmunocompromised patients, with significant morbidity and mortality. In one outbreak of nosocomial RSV in the ICU setting 21 out of 46 patients, who were positive for RSV developed diseases of different severity and four of them died (9).

RSV is difficult to culture. Cultures and antigen detection by IFA and EIA are highly sensitive and specific in children (75-90%) but much less sensitive in adults (40-70%), partly because children shed virus in larger quantities and during longer period of time. Serology is very sensitive but provides retrospective diagnosis only, unless IgM is identified. RT-PCR is highly sensitive but is not widely available.

Currently, aerosolized ribavirin and immunoglobulin preparations (polyclonal RSV immunoglobulin and a

specific monoclonal antibody) are used for treatment. Only case reports or small observational studies, mainly among Bone Marrow Transplant recipients or other severely immunocompromiced patients are available regarding ribavirin therapy.

In two reports the use of aerosolized ribavirin alone to treat RSV pneumonia in BMT recipients did not show benefit and has been associated with 70% mortality (10-11). Combination therapy with high-titered RSV immunoglobulin was evaluated in 16 BMT patients with RSV pneumonia, with a mortality rate of 50% (12). Therapy should be introduced prior to the development of respiratory failure. After the onset of respiratory failure it is uniformly fatal (12).

Treatment of BMT patients with RSV URI in order to prevent pneumonia development is very successful. In a study of 25 BMT patients with RSV URI who were treated with aerosolized ribavirin, only 32% developed pneumonia, and the mortality was 29%, compared to the 80% (13).

Intravenous ribavirin currently is not recommended for use. One study of intravenous ribavirin therapy in BMT patients did not show any benefit - the mortality was 80% (14). In a newer retrospective analysis of recipients of allogeneic hematopoietic stem cell transplants, in 6 out of 8 patients treated with IV ribavirin the virus was not detectable after treatment, virus clearance was associated with a trend to a better median survival and despite some toxic effects, intravenous ribavirin was well tolerated (15).

## Conclusion

Currently there are no reliable data supporting the use of ribavirin therapy in adults with RSV pneumonia, especially in patients without BMT or other significantly immunocompromised conditions. Treatment is very expensive, difficult to administer and is associated with many side effects. More studies are needed to evaluate the role of ribavirin therapy and to define the subpopulation of patients who will benefit the most from it.

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