SECONDARY INFECTIONS IN SWINE FLU
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ABSTRACT: BACKGROUND AND OBJECTIVE: Swine influenza is a respiratory disease of pigs caused by type A influenza virus that causes regular outbreak in pigs. Human to human transmission occurs. Some people develop severe respiratory symptoms and need ventilator. Patients can get secondary bacterial infections in the form of pneumonia if viral infections persist. Death of swine flu occurs due to secondary bacterial infections leading to bacterial pneumonias. METHOD: 369 patients having acute respiratory illness suspected to be suffering from swine flu were included. Real time reverse transcriptase polymerase chain reaction (RT-PCR) was performed on sputum samples or tracheal aspirates of 134 patients admitted in Hospital due to pneumonia. 90 of these patients were positive for swine flu by RT-PCR. RESULT: Among 90 patients 55 patients showed bacterial growth and 35 patients did not show any growth. Maximum patients 17 shows Klebsiella pneumoniae, 17 show Staphylococcus aureus, 10 show Escherichia coli, 8 show Pseudomomas aeruginosa and 3 patients show Streptococcus pneumoniae. Even after treatment, death of 36 patients occurred. Among these 36 patients, 19 had both, bacterial as well as swine flu infection and 17 patients had only swine flu infection. CONCLUSION: Secondary bacterial infections in swine flu patients were multi resistant to antibiotics were noted. Pneumonia caused by co-infection contributes to a severe rapidly progressive illness.

INTRODUCTION: Swine influenza is a respiratory disease of pigs caused by type A influenza virus. Humans are infected by close contact with pigs; human to human transmission occurs through coughing and sneezing [1]. Some people develop severe respiratory symptoms and need ventilator for life support. Patients can get secondary bacterial infections in the form of pneumonia if the viral infection persists [2].

Swine influenza was responsible for the human outbreak in 1918-20 that killed more than 20 million people over the world. It was called Spanish flu [3]. Swine flu influenza that started in Mexico in March 2009 has become the first pandemic of 21st century [4]. The current H1N1 influenza virus represents a quadruple re-assortment of two swine flu strains, one human and one
avian strain of influenza viruses, the largest proportion of genes coming from swine influenza viruses [5].

On May 16, 2009 the first Indian case of pandemic H1N1 2009 influenza was reported in a traveler from United States in Hyderabad [6]. By October 2009 cases were reported from all parts of India. The first death from pandemic H1N1 infection in India was reported on August 3, 2009 from Pune, which was due to bacterial pneumonia.

Death of patients of swine flu occurs due to secondary bacterial infections leading to bacterial pneumonia (WHO). Secondary bacterial infections should therefore be treated by appropriate antibiotics.

MATERIAL AND METHODS: This study was carried out from April 2010 to April 2011 in the Department of Microbiology. 369 patients having acute respiratory illness suspected to be suffering from swine flu were included. Post nasal swabs and throat swabs of these patients were collected in viral transport medium (VTM) and sent to National Institute of Virology (NIV) Pune. Diagnosis of H1N1 influenza was confirmed at NIV with the use of real time reverse transcriptase polymerase chain reaction (RT-PCR) assay [7].

Of these patients clinically showing signs/symptoms of pneumonia were admitted in hospital and out of these 21 patients had to be put on ventilators. Sputum samples or tracheal aspirates of these 134 patients were sent to Microbiology laboratory for secondary bacterial infections.

OBSERVATIONS AND RESULTS: Out of 369 patients suspected to be suffering from swine flu, 134 were admitted due to pneumonia. Out of these 134 patients, 64 were males and 70 were females. Majority of patients were in the age group of 22 to 30 years. 90 of these patients were positive for swine flu by RT-PCR. Among these 90 patients 55 patients showed bacterial growth in their respiratory tract samples submitted for culture. Majority of these patients (17) showed growth of Klebsiella pneumoniae. An equal number (17) showed Staphylococcus aureus. Ten other patients showed Escherichia coli, while 8 patients showed Pseudomonas aeruginosa and 3 patients showed Streptococcus pneumoniae. 35 patients did not have any bacterial growth in their respiratory secretions. Oseltamivir was administered to the confirmed cases and their close contacts, simultaneously patients with bacterial growth were treated with suitable antibiotics depending on susceptibility test.

Even after treatment, death of 36 patients occurred. Among these 36 patients, 19 had both, bacterial as well as swine flu infection and 17 patients had only swine flu infection.

DISCUSSION: Unlike seasonal influenza strains having impact on elderly people, swine flu H1N1 virus affects different age profile. It affects infant and middle age persons [8]. In our series we have most of the patients in the age group of 22–30 years, fitting well in the description. Seasonal and past influenza pandemics have been associated with an increased risk of secondary bacterial infections of Staphylococcus aureus [3] in our study amongst the Staphylococcus aureus many were MRSA. In addition, other isolated bacteria were also multi-resistant. Patients with swine flu have poor immune response to prevent bacterial infections. Some of these patients were on ventilators and hospitalized for longer time. Both these factors contribute to increased bacterial infections.
In our study 90 patients having pneumonia were positive for swine flu. Among these 90 patients 55 had secondary bacterial pneumonia as proved by positivity of their respiratory tract cultures. 35 other patients showed no bacteria in their respiratory secretions. This means these were patients of viral pneumonias. Pneumonia is known to be caused by swine flu virus. Pneumonia may be viral, secondary bacterial or both combined [9].

Even though patients having secondary bacterial infections were treated with suitable antibiotics, 19 of these succumbed. This indicates that probably the viral component of their pneumonia was dominant; the death was due to viral pneumonia. Seventeen of the persons without bacteria in sputum also succumbed. Thus most of the deaths in our study were due to viral pneumonia. Pneumonia caused by co-infection contributes to a severe rapidly progressive illness. Early diagnosis of patients will ensure early administration of antiviral drugs. Treatment of bacterial infection should be done immediately in order to prevent mortality.

Swine flu virus can maintain itself in environment. So in favorable conditions it will again cause epidemics, leading to more mortality.

REFERENCES: