Spontaneous Pneumothorax in H1N1 Infection

Ashutosh Chaturvedi¹, Arun Kumar²

Abstract
Spontaneous pneumothorax is a very rare entity in H1N1 infection unless it is co-existent with other respiratory conditions especially COPD. The other factors are old age, children below 5 years and patients with ILD. The mortality rate goes high with pulmonary illness complicated by H1N1 infection in smokers and in pregnant women. This is the first reported case of H1N1 infection with Spontaneous Pneumothorax in India.

Introduction
The current Influenza A (H1N1) is the most common influenza virus globally which was the cause for pandemic in 2009. The mode of spread is same as seasonal influenza. The most common symptoms are fever, sore throat, cough, myalgia and fatigue sometimes nausea, vomiting and diarrhoea in few cases.

We report a rare complication of this viral infection.

Case Report
Thirty years old lady was admitted to our hospital with a history of fever, cough and breathlessness of three days duration. There was no history of Angina, palpitations, orthopnoea or PND-paroxysmal nocturnal dyspnoea. She was also a case of RHD-Rheumatic heart disease with moderate MS and mild MR on Penicillin prophylaxis (Omitted since three months).

Initially she was admitted at a peripheral hospital where she had tachycardia, tachypnoea and hypotension. Examination of respiratory system revealed bilateral crackles. Investigations revealed anemia, deranged LFT and RFT. X-ray chest showed bilateral non-homogenous opacities in the lung field areas (Figures 1 and 2). She was managed as a case of RHD with pulmonary oedema in cardiogenic shock. On 2nd day of admission she had inferior wall myocardial Infarction for which she was thrombolysed with Tenacteplase. She was referred to our hospital for further management. Her clinical condition on admission was critical. There was not much change in her clinical, haematological or biochemical parameters. 2D ECHO revealed MVA of 1.9 cm² and LV function 45 %.

On 5th day of admission her nasopharyngeal swab sample confirmed H1N1 infection for which Tab Oseltamivir 75 mg, bd was started. During the recovery phase she had sudden onset breathlessness on 7th day which was not relieved on nasal oxygen. Patient was put on NIV (Pressure support- 10, PEEP- 06 and FiO2- 0.5) and her condition improved. She had sudden deterioration in the same evening. X-ray chest revealed pneumothorax (Figure 3) and ICD was placed subsequently. The further recovery in the hospital was uneventful.

Discussion
The seasonal influenza resolves spontaneously except in some special cases like cardiac or pulmonary conditions and immunosuppression in which the disease may become fatal. Pregnant women are four times more likely to be hospitalized than the general population when infected with this virus (H1N1). Confirmation of the diagnosis is by RT-PCR done on nasopharyngeal swab. This test was performed in our case after admission to ICU. Use of pharmacological agent is key to reduce mortality in seasonal influenza. As per the US Centres for Disease Control and Prevention (CDC) the fatality in these patients especially in pregnancy is high due to pneumonia requiring mechanical ventilation. H1N1 infection-related viral pneumonia was been associated with focal to extensive diffuse alveolar damage, marked hyaline membrane formation, pulmonary oedema and acute pulmonary haemorrhage.

In patients who develop ARDS oxygen saturation goes down because the effective area of ventilation becomes less due to stiff lung. Stiff lung is due to alveolar and interstitial oedema. Early proning is the key in management of ARDS. In recruitment of new alveoli the normal ones get overdistended and more prone for rupture. The regions of the lungs subjected to high-pressure overdistension may develop alveolar rupture resulting in air tracking.

Figs. 1 and 2: X-rays chest showing bilateral non-homogenous opacities in the lung field areas in H1N1 infection

¹Classified Specialist, Internal Medicine, Military Hospital, Faizabad, Uttar Pradesh; ²Professor and Head, Dept of Nephrology, Command Hospital, Lucknow, Uttar Pradesh
Received: 01.07.2016; Accepted: 02.02.2017
Our patient had H1N1 pneumonia and had acute deterioration in her clinical condition on 7th day requiring NIV support keeping PEEP at 05 and pressure support at 10 which is near physiological and it cannot be the reason for pneumothorax.

The rupture of peripheral bullae can cause spontaneous pneumothorax whereas secondary pneumothorax develops in the setting of pre-existing lung disease e.g. COPD, pneumonia, cystic fibrosis, lung malignancies, and certain types of interstitial lung disease.\(^5\)

Sub-pleural and intrapulmonary air cysts occur in ARDS patients.

Among patients with pneumothorax, 30 to 38 % have recurrence.\(^6\) Although primary spontaneous pneumothorax usually resolves in 2 to 4 days of drainage, pneumothoraces in patients with underlying lung disease often last substantially longer.\(^7\) Diffuse alveolar damage, sub-pleural and intrapulmonary air cysts might occur in influenza-related ARDS and may lead to spontaneous pneumothorax. Our patient had two monthly OPD visits (post discharge) uneventfully.

**Conclusion**

Spontaneous pneumothorax is very rare in H1N1 infection unless it is complicated by ARDS requiring mechanical ventilation. This is because of rupture of bullae or overdistanded alveoli. High degree of suspicion, prompt diagnosis with nasopharyngeal swab and early institution of Oseltamivir is helpful.

**References**