EARLY IDENTIFICATION OF SWINE INFLUENZA A (H1N1)- BASING ONEPIDEMIOLOGIC CLUE, CLINICAL PRESENTATION, IMAGING FINDINGS, PERIPHERAL LEUCOCYTE COUNTS AND SPO2 LEVELS

Venkateswararao Kopparti[1]

[1]*Assistant Professor, Department of TB and Chest Diseases, Gitam Institute of Medical Sciences and Research, Visakhapatnam.*

ABSTRACT

BACKGROUND

The present study is a retrospective study of 22 cases of RT-PCR positive swine influenza spanning from 2014 to 20-09-2017 with main objective of early identification of influenza A H1N1 basing on epidemiological clue, clinical presentation, imaging findings and lab parameters as early antiviral therapy and judicious management of ARDS brings good outcome as per available literature.[1,2,3]

MATERIAL AND METHODS

22 confirmed adult cases of swine influenza by throat/nasopharyngeal swab RT-PCR for H1N1 were studied in terms of clinical presentation, imaging findings, lab manifestations and SpO2 levels[4] with particular emphasis on imaging findings.

RESULTS

95% presented with symptoms of Influenza-Like Illness (ILI). Nearly, 80% of patients belonged to fourth to fifth decades. Leucocyte count was normal in 75% and 25% had low leucocyte count (<4000), SpO2 levels were normal in 25% and low in 75% cases. CXR was abnormal in 82% of cases of which 83% had mid/lower zone peripheral, patchy, pleural-based consolidations and 17% showed all lung zone opacities. HRCT chest done in 32% of cases showed similar features of chest x-ray findings with dominant mid/lower zone pleural-based consolidations to ground-glass haziness without pleural effusions and no mediastinal nodal involvement.

CONCLUSION

As intermittent outbreaks of swine influenza are still continuing in India with recent spurt in incidence in the months of April/May 2017, early diagnosis of H1N1 A is necessary for improved outcome. Early diagnosis is feasible by ILI presentation, normal or low leucocyte count, low SpO2 levels and characteristic radiologic findings of bilateral mid/lower zone pleural-based peripheral patchy opacities to consolidations. As this can be done at peripheral level, primary care physicians need to be sensitised in early diagnosis and treatment and prompt referral to higher centres when needed. Since, the present study is a retrospective one and of public health importance, hospital ethics committee permission was taken.

KEYWORDS

Swine Influenza-Early Diagnosis, Imaging Findings, Influenza-Like Illness.

HOW TO CITE THIS ARTICLE: Kopparti V. Early identification of swine influenza A (H1N1)-basing on epidemiologic clue, clinical presentation, imaging findings, peripheral leucocyte counts and SpO2 levels. J. Evid. Based Med. Healthc. 2017; 4(88), 5163-5166. DOI: 10.18410/jebmh/2017/1031

BACKGROUND

Influenza is a global disease with frequent occurrence causing significant morbidity and mortality, particularly in very young and very old people and in people with comorbidities.[5] Pandemic influenza occurs every 10 to 40 years and seasonal influenza occurs every 3 to 4 years. Seasonal influenza is most often caused by influenza B with primary host being humans only and the virus shows antigenic drifts for its presence and is often self-limiting except in people with comorbidities. Influenza A has a wide variety of hosts like Avian, Swine, Eurasian and when it strikes humans, it has high human to human transmission and causes pandemics like the Spanish Flu in 1918, the Asian Flu in 1957, the Hong Kong Flu in 1964, to the current pandemic of swine influenza A H1N1, which has started in March, 2009, in Mexico and it spread globally killing millions of people.[1,2,3] Though the world is in the post-pandemic phase in India, it still causes sporadic outbreaks without seasonal predilection and it affects all populations with higher incidence in people with comorbidities[5] and has significant morbidity and mortality.

AIM-The present study is a retrospective study of 22 cases of RT-PCR positive swine influenza spanning from 2014 to 20-09-2017with main objective of early identification of

Financial or Other, Competing Interest: None.
Submission 10-10-2017, Peer Review 16-10-2017,
Acceptance 24-10-2017, Published 02-11-2017.
Corresponding Author:
Dr. Venkateswararao Kopparti,
Flat-4A, Krishnaveni Towers, Palace Layout,
Peda Waltair, Visakhapatnam-530017, Andhra Pradesh.
E-mail: kvraochest@yahoo.com
DOI: 10.18410/jebmh/2017/1031

influenza A H1N1basing on epidemiological clue, clinical presentation, imaging findings and lab parameters as early antiviral therapy and judicious management of ARDS brings good outcome as per available literature1,2,3.

MATERIAL AND METHODS

Twenty two cases of RT-PCR positive swine influenza (definite criteria for inclusion) were studied from March 2014 to September 2017 with symptomatology of Influenza-Like Illness (ILI) (acute febrile illness, sore throat, rhinorrhea, body pains, cough with breathlessness, diarrhea and categorised into 1). Category A: Symptoms of ILI, but of mild degree advised to confine to home and no oseltamivir.2). Category B: Similar symptoms, but of high-grade fever and high-risk groups (children, pregnant women, people with comorbidities) advised to confine to home and oral oseltamivir.3). Category C: As of B, but with respiratory distress, hypotension, other organ complications, needs hospitalisation and respiratory support along with oral oseltamivir. In the present study, patients with category B and C were admitted. Peripheral leucocyte count, platelets, SpO2 levels and imaging findings were noted. Confirmatory test used in this study was throat swab/nasopharyngeal swab for H1N1 RT-PCR positivity. Those cases with ILI, but with negative RT-PCR for H1N1 were excluded in the present study. Serial chest x-rays were taken for all patients and HRCT chest scan was done for 7/22 patients (32%).

RESULTS

Out of the 22 positive cases, 87% presented in the current year 2017 with peaks in months of April/May with subsidence later. Both sexes were equally affected and the majority (80%) belonged to fourth to fifth decade. More than 95% presented with typical Influenza-Like Illness (ILI). Nearly, 90% of patients were noted to have fever and dry cough at time of presentation. Normal or low leucocyte count was observed in all of them (75% had normal and 25% had low leucocyte counts) despite having fever and platelet count was noted to be within normal limits. 75% of patients showed SPO2 levels below 90% with room air.

Chest x-ray was noted to be normal in 4 cases (18%) and abnormal in 18 cases (82%). Among the abnormal CXRs, majority (83.7%) showed bilateral, predominantly mid and lower zone peripheral patchy airspaceopacities to consolidation and the remaining (16.3%) showed all lung zones involvement with widespread airspace infiltrations representing ARDS.HRCT chest was done in 7 of 22 cases (32%) and all showed bilateral mid and lower zone ground-glass opacities to consolidations with air bronchograms, which were peripheral and with subpleural predominance, pleural effusions were not noted and mediastinal adenopathy was insignificant. About 23% of cases progressed to dense consolidation involving all lung zones and this group might have represented conglomeration of viral pneumonia with severe ARDS radiologically, resolution of opacities was seen in a week in 80% of patients. HRCT chest features similar distribution of opacities as that of chest x-ray, but with more clear pleural-based presentation of consolidations and ground-glass haziness with dominant mid/lower zone predilection with minimal infiltrations in upper zones, which were not seen in chest x-ray. The close differential diagnosis could be cryptogenic organising pneumonia and peripheral eosinophilia.

Case I

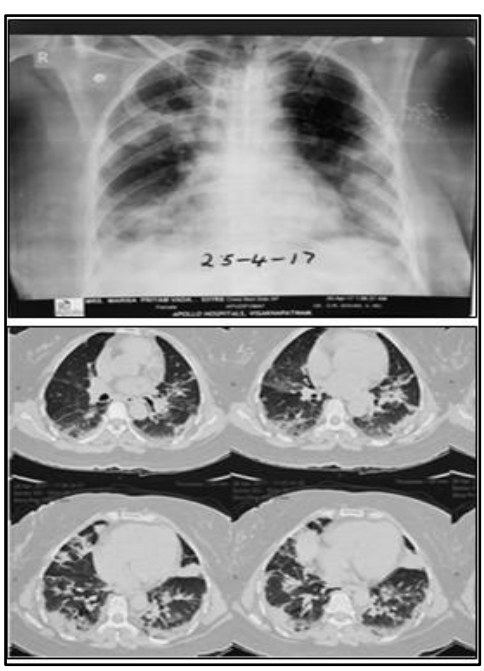

Figure 1. Typical Radiologic and CT Distribution of Opacities with Basal Pleural-Based Predominance

Case II

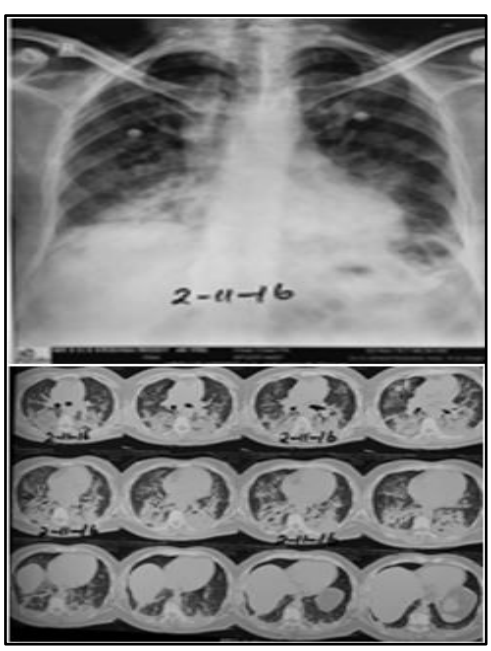

Figure 2. CXR/HRCT shows Mid/Lower Zone Consolidations with Air Bronchograms, Pleural Based

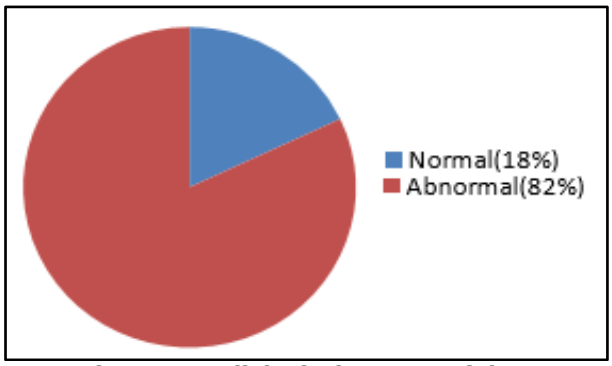

Figure 3. Radiological Features (Chest X-Ray)Air Space Infiltrations

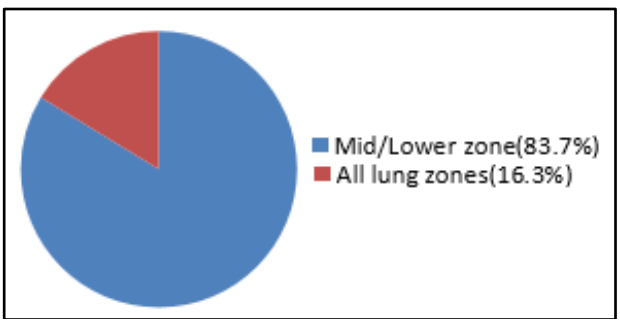

Figure 4. Abnormal Chest X-Ray- Distribution of Opacities

Unilateral	5%
Bilateral	95%

Table 1. Laterality in Chest X-Ray

HRCT chest done in 32% of cases (7/22) all showed bilateral mid/lower zone pleural-based opacities.

DISCUSSION

The current pandemic of H1N1 influenza A (H1N1 pdm09) has been continuing with intermittent outbreaks without any seasonal predilection and it dominantly affects patients with one or more comorbidities with significant morbidity and mortality.[6,7,4,3] Influenza severity varies from mild upper respiratory tract illness to severe viral pneumonia with ARDS. Present state of knowledge explains that the severity is related to viral-induced lung damage on one hand to overactive uncontrolled immune response from the host leading to ARDS[4,3] on the other hand. The former is amenable to treatment if antivirals are started promptly within a week, but several trials with different drugs including corticosteroids,[8] statins[8,3] failed to show any proven benefit to control the exaggerated immune response. Good outcome is related to early identification of the illness, early institution of antivirals and by prompt ventilatory support when needed. People who have been on prolonged ventilatory support are at risk of ventilator associated pneumonia, need antibiotics according to hospital antibiogram.[9] Delay in seeking medical care leads to increased mortality.[3]

The present retrospective study though of small number shows that-

1. More than 90% of patients presented with typical influenza-like illness with upper respiratory symptoms, fever, dry cough, sore throat, normal to low SpO2 levels and typical radiologic evidence of mid, lower zone predominant subpleural multifocal airspace opacities to dense consolidation and in some cases they extend to involve all lung zones[10] and most of them have either normal or low leucocyte count features, which should prompt one to make definitive diagnosis by nasopharyngeal, tracheobronchial specimen for RT-PCR for H1N1.Multiplex RT-PCR is the presently recommended diagnostic method with high specificity and sensitivity.
2. Neuraminidase inhibitors (oseltamivir, zanamivir, laninamivir) should be given as soon as the diagnosis is suspected with above clinical spectrum without waiting for confirmation.[1,2,3] Ventilator support should be provided with either NIV or invasive mechanical ventilation with ARDS parameters adherent to the protocol guidelines when needed.

CONCLUSION

As the seasonal outbreaks are still continuing with reports from all over India with considerable mortality, healthcare professionals need to be sensitised about early identification of swine influenza. Influenza viral illness should be suspected when a person presents with acute febrile illness with upper respiratory symptoms, respiratory distress, low SpO2 and normal or low leucocyte count and when chest x-ray be either normal or showing bilateral opacities with mid/lower zone predominance with subpleural predilection. Those with moderate-to-severe ARDS should be provided IMV. At present, neuraminidase inhibitors should be given earliest when the illness is suspected without waiting for confirmation. Medical personnel should suspect the disease with above clinical spectrum with epidemiological clue and prompt initiation of antivirals and referral to higher centres for those who need advanced life support.

REFERENCES

[1] Muthuri SG, Venkatesan S, Myles PR, et al. Effectiveness of neuraminidase inhibitors in reducing mortality in patients admitted to hospital with influenza A H1N1 PDM 09 virus infection: A meta-analysis of individual participant data. Lancet Resp Med 2014;2(5):395-404.

[2] Lee N, Leo YS, Cao B, et al. Neuraminidase inhibitors, super infection and corticosteroids effect on survival of influenza patients. Eur Resp J 2015;45(6):1642-1652.

[3] Li H, Cao B. Pandemic and avian influenza a viruses in humans: epidemiology, virology, clinical characteristics, and treatment strategy. Clinics Chest Med 2017;38(1):59-70.

[4] Shieh WJ, Blau DM, Denison AM, et al. 2009 pandemic influenza A (H1N1): Pathology and pathogenesis of 100 fatal cases in the United States. Am J Pathol 2010;177(1):166-175.
[5] Risk factors associated with severe manifestations of 2009 pandemic influenza A (H1N1) infection in China: A case-control study. Viral J 2013;10:149.
[6] WHO FLU Net Summary. http://www.who int/influenza/gisrs_laboratory/updates/summary report/Access Feb21, 2016.
[7] Human infection with pandemic A (H1N1)2009 influenza virus: Clinical observations in hospitalized patients, Americas, July 2009 - update. Wkly Epidemiologic Rec 2009;84(30):305-308.
[8] Kim SH, Hong SB, Yun SC, et al. Corticosteroid treatment in critically ill patients with pandemic influenza. A/H1N1 2009 infection: Analytic strategy using propensity scores. Am J Resp Critical Care Medicine 2011;183(9):1207-1214.
[9] Chertow DS, Memoli MJ. Bacterial coinfection in influenza: A grand rounds review. JAMA 2013;309(3):275-282.
[10] Bakhshayeshkaram M, Saidi B, Tabarsi P. Imaging findings in patients with H1N1 influenza A (H1N1) infection. Iran J Radiology 2011;8(4):230-234.