Comorbidities In H1N1 Positive Patients – Hospital Based Study

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Abstract
Background: Since the 2014 pandemic of H1N, there have been respiratory emergencies every year throughout India, but in the early part of this year that is between December and March 2015 an explosion of cases was seen throughout the country, and so also in our state, Telangana. The study of comorbidities and their relation to severity of H1N1 infection helps in early suspicion, isolation, detection and treatment of patients. Thereby further spread of the disease can be controlled and the patients saved.
Material and methods: This is a Hospital based study conducted at the Sir Ronald Ross Institute of Tropical and Communicable diseases, Hyderabad between December 2014 and April 2015. Study sample was the total number of confirmed cases of swine flu who were admitted in the swine flu wards.The objectives were to describe the incidence and outcome of H1N1 positive casesassociated with various comorbid conditions.
Results: Out of 246suspects admitted, 85tested were positive for swine flu. Out of 85 cases the 47 positive cases were females (5.3%) and 38 were males (55.3%). Out of the 85total cases44(51.76%) cases had comorbidities like, Hypertention (40.9%), diabetes mellitus (27.27%), bronchial asthma(18.18%), pulmonary tuberculosis(4.54%),interstitial lung disease(4.54%), and pregnancy(4.54%). Majority of the patients with comorbidities had prolonged duration of hospital stay(< 10 days) than the patients without any comorbidities.
Conclusions: Positive H1N1 with severe disease profile have a poor outcome. Early identification of high-risk factors and thus early management of cases with will help in reducing the overall severity of the disease.
Keywords: H1N1, swine flu, comorbidies, pregnancy

I. Introduction

The risk factors for severe H1N1 infection include diabetes mellitus, chronic respiratory, cardiovascular diseases as well as diseases related to smoking, pregnancy, immuno suppression, hypertension and delay in diagnosis.[1,3]Pregnant women have increased risks for cardiopulmonary complications related to influenza infections during seasonal influenza epidemics. In addition, the hyperthermia that characterizes influenza infections places fetuses at higher risks for perinatal complications, including preterm births and birth defect. The severity of infection is more in cases with comorbidities compared to the cases without any comorbidities.

II. Material And Methods

Study design: Hospital based study.
Study setting: Swine flu ward, Sir Ronald Ross Institution of Tropical and Communicable diseases, Hyderabad.
Period of study: December 2014 to March 2015.
Sample size: Total number of confirmed swine flu cases admitted to swine flu ward of Department of SRRIT&CD, Hyderabad in the study period.
All 85 of them were immediately isolated and throat swab was taken at the earliest and sent to the laboratory. Tab. Oseltamivir 75mg, BD was started. Co-morbidities were meticulously managed.
Suspects of swine flu are categorised into:
Category A - Previously healthy, no comorbidity, mild fever (no need of swab, no need of oseltamivir)
Category B_1 - A+ high fever and sore throat (no need of swab, no need of oseltamivir)
B_2 - children less than 5 years, pregnant women, age more than 65 years and comorbidities (admission + oseltamivir)
Category C - Breathlesness, cyanosis, chest pain, hemoptysis, respiratory failure[4] (admission + swab, oseltamivir)
Criteria for patient selection:
Inclusion criteria - All category B & C swine flu confirmed cases admitted inswine flu wards of SRRIT&CD.
Exclusion criteria – All swine flu suspect and probable cases were excluded from the study.

For all cases investigations likecomplete blood picture, fasting and post prandial blood sugars, chest x-ray PA view, throat swab for viral assay, sputum for Acid fast bacilli, gram stain, blood culture, liver function tests,ECG and CT scan chest wherever necessary.

III.   Results
In the study, out of 246 total swine flu suspects, 85(34.5%)cases were tested positiveas shown in table 1& Figure 1. Among these, 44(51.76%) cases were associated with comorbid cnditions whereas 41 cases were not associated with any comorbidies as shown in the Table 2 & Figure 2. Distribution of comorbidities in relation to the gender among H1N1 confirmed cases were seen in Table 3.Out of the 44cases, females were 16 (38.64%) and males were 27 (61.36%). Distribution of comorbidities in relation to gender was shown in Table 4. Among these18(40.9%) cases were associated withHypertention, 12(27.27%) cases with Diabetes mellitus, 8 (18.18%) cases were associated with Bronchial asthma, 2 (4.54%) cases each withinterstitial lung diseases, pulmonary tuberculosis and pregnancy.Association of illness duration before hospitalization and hospital stay with disease out come was shown in Table 5.

Table 1: Distribution of H1N1 cases

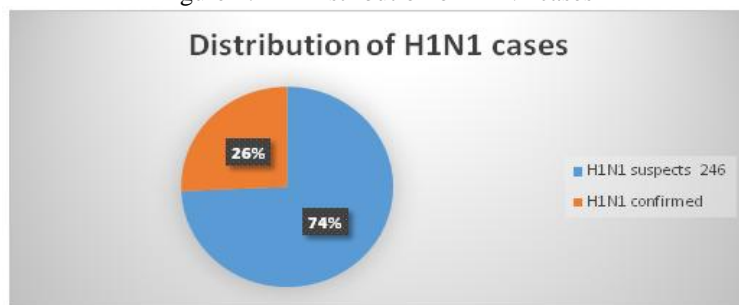| H1N1	Suspects	Confirmed
Number of cases	246	85
Percentage	100%	34.5%

Figure 1:   Distribution of H1N1 cases

Table 2: Distribution of H1N1 in relation to comorbidities (n=85)

H1N1 cases	Cases with comorbidities	Cases without comorbidities	Total
Number of cases	44	41	85
Percentage	51.76%	48.24%	100%

Figure 2: Distribution of H1N1 in relation to comorbidities (n=85)
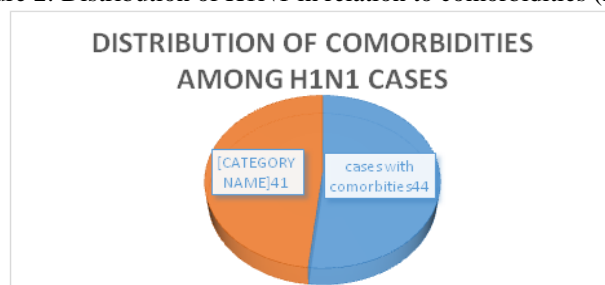
Table 3: Gender wise distribution of comorbidities H1N1 cases(n=44)

Comorbidities	Male	Female	Total
Bronchial Asthma	3 (6.82%)	5 (11.36%)	8(18.18 %)
Pulmonary TB	2 (4.54%)	-	2(4.54 %)
Interstitial lung Diseases	2 (4.54 %)	-	2 (4.54 %)
Diabete Mellitus	6 (13.64 %)	6 (13.65 %)	12 (27.27%)
Hypertension	14(31.82%)	4 (9.09 %)	18 (40.90%)
Pregnacy	-	2(4.54%)	2(4.54%)
Total	27(61.36%)	47(38.64%)	44(100%)

Table 4: Association of comorbidies duration before hospitalization and hospital stay with disease out come.

Time interval		Cases with comorbidies	Cases without comorbidies
Duration before hospitalization	1-5 days	8	4
	6 -10 days	20	26
	> 10 days	16	11
	Total	**44**	**41**
sDuration of hospital stay	1-5 days	1	8
	6-10 days	8	27
	>10 days	35	6
	Total	**44**	**41**

IV. Discussion

Incountries where H1N1 pandemic is established, the main aims of surveillance arecontinuous monitoring of the epidemiological picture of thepandemic and its impact on the healthcare infrastructure. In our study women were more than men, but this could be due to the fact that all the women in our study had one comorbidity or the other. In the current pandemic of H1N1 sore throat, cold, cough and breathlessness were present in all patients (100%). 44 out of the 85 (51.76%) confirmed cases had comorbidities like bronchial asthma, diabetes mellitus, pregnancy, pulmonary TB, hypertension, interstitial lung disease. None of these cases gave history of travel in the recent past. Patients associated with pulmonary tuberculosis and interstitial lung disease were in respiratory failure, but finally they could be managed.

2 cases of H1N1 have been reported in pregnant women, both of them were without prior exposure to confirmed or probable cases of the disease or who had no history of recent travel to other pandemic regions. These cases occurred during the first trimester of pregnancy.First patient is of 30-year-old woman G3P2L2 with 6 weeks' gestation presented with a one week history of fever, chills, cough, myalgia and shortness of breath. Initial vital signs included blood pressure, 100/94 mmHg, heart rate, 120 beats per minute; oral temperature, 98.9°F with normal blood counts, but ESR was increased with 60mm in first hour and 86 mm in second hour. Pertinent physical findings included decreased breath sounds bilaterally. The chest radiograph demonstrated normal heart size, no pulmonary consolidation, and no pleural reaction. On day 2, the patient's oral temperature was 1013F. On day 4, the patient developed acute respiratory distress. Vital signs included a heart rate of 102 beats per minute with coarse breath sounds bilaterally. Subsequent real-time reverse transcription-polymerase chain reaction (RT-PCR) analysis of a throat swab specimen was positive for H1N1infection. She was treated with oral therapy with oseltamivir, 75 mg twice a day for 5 days.On day 5, the patient's oral temperature increased to 104°F, and she became hemodynamically unstable. By day 6, the patient had still high temperature, however, the chest radiograph demonstrated persisting costophrenic consolidation. Subsequent urine, blood, and sputum cultures all had negative findings for bacterial superinfections. The patient improved hemodynamically and continued to recover uneventfully and was discharged.

The second patient is of 25 year old female G2P2L2 with 8 weeks gestation presented with fever and cough since 3days. She had elevated vital signs and increased blood counts and ESR. The chest radiograph obtained revealed features of Bronchitis. Real-time reverse transcription-polymerase chain reaction (RT-PCR) analysis of a throat swab specimen subtyping confirmed a diagnosis of H1N1 infection. Urine, blood, and sputum cultures all had negative findings for bacterial superinfections. She was treated with oral therapy with oseltamivir, 75 mg twice a day for 5 days. The patient improved hemodynamically and continued to recover uneventfully and was discharged.

The twocases presented here of H1N1 that was confirmed by RT-PCR during the first trimester of pregnancy shared several presenting findings of history and physical examination with symptoms and signs of swineflu. Many similar cases were reported in the literature.[3]. The difference in the history findings in others include third trimester pregnancy and a short prodrome of typical febrile, influenza-like illnesses. But in our case the patient was in first trimester presented with only symptoms of acute respiratory illness ad later developed respiratory distress. The cases associated with other comorbidities like diabetes mellitus, interstitial lung disease, pulmonary tuberculosis hypertension, bronchial asthma also had a very complicated course and longer duration of hospital stay whencompared to the cases without comorbid conditions. 35 out 44 patientswith comorbid conditions stayed more than 10 days , 8 patients stayed for 6 – 10 days and only one patient stayed less than 5 days. In contrary to this, among patients without any comorbidities, majority of them stayed in hospital for less than 10 days. All 44 patients recovered fully and were discharged after long duration of hospitals stay. They were followed up after 1 and 2 weeks. Their symptoms had come down and x-rays cleared. Similar studies were reported in literature [4-9]. The study shows that swine flu infection takes a very complicated course in patients with comorbidities diabetes, bronchial asthma, pregnancy etc,.Early institution of Oseltamivir and antibiotics and good oxygenation helps the patients. There were no deaths in our Institution and noresidual symptoms were seen in patients at follow up.

V. Conclusions

patients with H1N1 infection should be isolated and the prognosis of the disease is best when treatment is started as early as possible. Comorbidities increase the risk and severity of infection in all patients. Hence individuals with risk factors need to be protected by vaccination.

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