

## Original Research Article

# Cross-sectional descriptive observational study of RT PCR proven category C H1N1 patients at tertiary care centre from January 2015-December 2015

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### ABSTRACT

**Background:** The onset of winter of 2014-2015 saw an alarming spurt in influenza A (H1N1) pdm 09 leading to a significant mortality. H1N1 primarily affects the very young, elderly, pregnancy and those patients with comorbidities. But the epidemiologic hallmark of pandemic influenza is its "pandemic signature" meaning most early mortalities are among young healthy adults.

**Methods:** To study clinical profile, premorbid conditions and radiological features of Category C H1N1 proven by RTPCR retrospectively from hospital records from Jan 2015 to Dec 2015 at Tertiary Care Centre.

**Results:** Total 108 cases RT PCR proven category C H1N1 studied from hospital records. 43 were males and 65 females. The mean age group was 50 years for males and 40 for females. Common symptoms were fever, cough, dyspnoea with pre-morbid illness like hypertension, diabetes mellitus, pregnancy, cancer and immune compromised with pulmonary tuberculosis. Radiologically there was lower zone involvement common in live patients and reticulonodular was common in death cases.

**Conclusions:** In current study young to middle age group was commonly affected. Pre-morbid conditions, more than two risk factors and late referral were the most common findings in death cases.

**Keywords:** H1N1 virus, Swine flu

### INTRODUCTION

After 2010, pdm H1N1 reappeared in several northern and western states of the country during the winter month of 2012-2013.<sup>1</sup> Resurgence since December 2014 appeared to be worse than previous one leading to over 30,000 cases and 2000 death countrywide (as of 28<sup>th</sup> March 2015).<sup>2</sup> The unique characteristic of antigenic shift and drift mimics a science fiction producing novel transformers eventually affecting population at large.<sup>3</sup> More recently researchers from MIT USA have proposed that the H1N1 strain in India seems to have acquired

genetic mutation (in hemagglutinin glycoprotein structure) in the past 2 years thereby rendering it more serious and infectious. Present study is retrospective from hospital cases admitted from January 2015 to December 2015.<sup>3</sup>

### METHODS

Available hospital records were retrospectively studied from January 2015 to December 2015. Only category C RT PCR proven H1N1 at NIV Pune admitted at tertiary care centre Chhatrapati Pramilaraje Rughnalaya, Rajarshi

Chhatrapati Shahu Maharaj Government Medical College Kolhapur, Maharashtra, India admitted in ICU were studied. They were categorized as per WHO fresh guidelines. Detailed physical examination, investigations like laboratory tests- CBC, liver and renal function tests, ECG and X-ray chest PA were studied. Data was analyzed by universal sampling using 'R' software test SPSS 20 for equality of proportion and one sample test compared using p value with 0.05. This study was approved by institutional ethical committee.

**RESULTS**

Total 108 cases RT PCR proven with category C patients selected retrospectively from hospital records from January 2015 upto December 2015. 43 males (39.8%) and 65 females (60.1%) were affected. 33 cases out of 108 cases died in which 17 males (15.7%) and 16 females (14.8%) died.

**Table 1: Age group in live H1N1 cases (n=75).**

Age in years	M	Percentage	F	Percentage
20-40	9	12	26	34.66
41-60	11	14.66	14	18.66
61-80	6	8	9	12

Mean age group for live males= 47.6 years. Mean age group for live females= 43.09 years.

**Table 2: Age group in death H1N1 cases (n=33).**

Age in years	M	Percentage	F	Percentage
20-40	6	18.18	10	30.30
41-60	6	18.18	4	12.12
61-80	3	9.01	2	6.06
81-100	2	6.06	0	-

Mean age in males= 50.5 years. Mean age in females= 40 years. P value <0.0497 i.e. <0.05. Therefore, proportion of male deaths is greater than female deaths.

**Table 3: Symptoms and signs (n=108).**

Symptoms and signs	No. of patients	Percentage
Fever	102	94.4
Cough	106	98
Throat pain	28	25.9
Haemoptysis	4	3.7
Vomiting	6	5.5
Diarrhoea	4	3.7
Dyspnoea	86	79
Tachypnoea	88	81.4
Hypoxia	52	48
Hypotension	12	11
Crepts	106	98
Rhonchi	52	48

Common symptoms were fever in 102 pts. (94.4%), cough 106 (98%), throat pain 28 (25.9%), vomiting 6 (5.5%), hemoptysis and diarrhoea in 4 (3.7%), dyspnoea 86 (79%). Common sign was tachypnoea 88 (81.4%), crepts 108 (98%), rhonchi 52 (48%), hypoxia 52 (48%), hypotension 12 (11%).

**Table 4: Radiological findings in category C patients.**

Live (N=75)		Death (n=33)		
Zones involved	M+F	Percentage	M+F	
Right lower	15	20		
Left lower	17	22.6		
Both lower zone	21	28	2	6.06
Reticulonodular	-	-	26	78.78
<b>(More than 2 zones)</b>				
Interstitial			5	15.15
Bronchitis	9	12		
Old TB	3	4		
Pleural effusion	1	1.33		
Normal	9	12		

From the above Table, lower zones are commonly affected in live H1N1 patients 42.6% (33 pts.) and Reticulonodular in 26 (78.78%) death cases.

39 (36.11) patients had < two zones of lungs affected and 52 (48.14) had 2 > two zones of lung affected. Interstitial in 5 (15.15%), 9 (12%) had bronchitis and old TB (4%), normal in 9 (12%).

In conclusion, the dead patients had more than two zones reticulonodular as common occurrence in these patients.

**Table 5: Pre-morbid conditions.**

Diseases	Live (75)	Percentage	Death (33)	Percentage
HT+DM			3	9.09
CVA+HT			2	6.06
ASD+AF			2	6.06
Cancer (malignancy)			1	3
HIV (RVD)			2	6.06
TB	3	4		
IHD+HT			2	6.06
HT	4	5.33		
DM				
DM+CVA			1	3
Pregnancy			3	9
Sepsis			3	9
Shock with MoF			2	6.06

12(36.36%)Patients had more than one risk factor. 9 (27.27%) had single risk factor in dead patients. 12 patients (36.36%) were healthy but they had more than 2 zones affected and reticulonodular shadows and despite

aggressive ventilator support patients succumbed to death.

## DISCUSSION

Seasonal influenza is an acute respiratory illness that occurs particularly during the winter month.<sup>4</sup> Type A virus is the most virulent and this virus can mutate easily.<sup>4</sup> Borse RT et al, described in their study age group was 33.43 with maximum patients between 18-40 years. In study mean age group 47.6 years in males and 43.09 years in females.<sup>5</sup> Puvalingam et al study showed, fever cough breathlessness were the common symptoms which matches present study. Pregnant ladies had suffered H1N1 in the last trimester of pregnancy in present study also which is comparable with Puvalingam et al study.

Borse RT et al, showed radiologically lower zone involvement which matches this study in live cases either lower zones were affected.<sup>6</sup> In dead cases bilateral reticulonodular in 78.7% cases.<sup>7</sup> Jain S et al, (NEJM) shows 66 patients bilateral findings and Galit Aviram et al they showed ground glass appearance 69% consolidation in 59% cases.<sup>8</sup> Panchal V et al, also shows lower zone and bilateral multi zonal involvement.<sup>9</sup>

Pre-morbid condition in death cases were hypertension, diabetes, pregnancy, HIV, cancer which coincides with Perez R NEJM and many previous authors described it.<sup>10</sup> 22 patients who died had more than two risk factors. 12 patients (36.36%) had no pre-morbid illness died as they were referred late to the tertiary care centre and were started on oseltamivir late after the onset of acute respiratory distress syndrome. Three patients were pregnant in third trimester were referred late to tertiary care centre. Three patients had sepsis, hypotension and multi-organ failure because of H1N1 complication.

## CONCLUSION

In present study, we want to conclude that premorbidity and late referral to Tertiary Care Center had led to death in these cases.

In present study, young to middle age patients were commonly affected. Fever, cough, breathlessness, tachypnea, crepitations as common clinical features. Common comorbidities were hypertension, diabetes, Ischemic Heart Disease, Cerebro Vascular Accidents, pregnancy and malignancy. Common radiological features were lower zone involvement and reticulonodular shadows. Deaths were more in presence of comorbidities, pregnancy with reticulonodular shadows and complications like MODS, sepsis and AKI.

The present resurgence of pandemic virus cannot be attributed to any single factor at this stage. The prolonged cold and dry weather possibilities of drift virus absence of annual flu variation could have played an integrated

role of sero-epidemiology which should be given its due importance for vaccination policy along with the molecular surveillance of influenza virus circulating strains which is already ongoing in India through an established influenza surveillance network.

A model system should be developed to predict such resurgence in future and building up of herd immunity against all the circulating influenza viruses along with pdm H1N1 is essential to fight the battle with viruses.

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