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Verbal Autopsy of Swine Flu Confirmed Cases in Surat City

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ABSTRACT

Background: Delay in seeking treatment or delayed referral to higher centre, co-morbid conditions as well as low suspicion index in the early phases of epidemic were common reasons of poor patient outcome. Objective of the study was to assess the epidemiologic characteristics and high-risk profiles among reported deaths with H1N1 influenza in Surat city.

Method: Verbal autopsy audit of 30 swine flu positive cases were carried by household visit and checking medical records from respected hospitals of Surat Municipal Corporation area as well as Tapi district.

Results: Deaths were higher among age group of 18-45 years and among male population. Out of total 30 deaths, only 4 swine flu positive patients had reported to hospital within 48 hours after onset of signs & symptoms. More than 90%% swine flu death patients did not take Oseltamivir within 48 hours after onset of signs & symptoms. Diabetes, hypertension and IHD were major co morbid conditions associated with H1N1 fatality.

Conclusion: Mortality was higher in patient having co-morbid conditions like hypertension, diabetes, and IHD. Longer interval between onset of signs and symptoms to diagnosis as well as referral and initiation of Oseltamivir may be the possible reason for higher mortality during swine flu epidemic 2017.

Key words: Verbal autopsy, Swine flu, H1N1 positive deaths, Oseltamivir Lag, Co morbid condition, Surat

INTRODUCTION

Swine flu is a respiratory disease caused by type A influenza virus, having the highest potential for regular outbreak[1]. Basically influenza A, B and C all are viruses that cause pig's flu but can be transmitted to humans being. A and C virus occur in pigs, but not B. Also within influenza A and C, the strains found in pigs and humans are quite different [2, 3]. But due to triple reassortment of genes from all the three components of avian, swine and human viruses, influenza A H1N1 has highest potential for regular outbreak in the community[4].

In April 25th and 26th respectively WHO and United States declared Swine flu, a public health emergency. On 29th April WHO raised the pandemic influenza phase from 4 to 5, with two countries having 60% of patients under 18 yrs, who are more susceptible than elderly people who has some degree of cross protection against H1N1[5,6,7].

VA was 1st named in India as an alternative to lay reporting during 1950s-60s through systematic interview by the physician/s to determine the causes of death by the workers involved in Narangwal project in India [8, 9]. To know the exact cause of death and to prevent further such deaths VA is one of the most important public health tool to gather information regarding cause of death [10].

The diagnosis is based on the RT-PCR [11, 12]. The period of communicability of swine flu is roughly first 5 days of the illness although children may remain contagious for up to 10 day. Laboratory diagnosis is also possible during this time [13]. Human

infection with variants of influenza virus occurs in people with exposure to infected pigs. When infected pigs cough or sneeze, droplets infect nasal mucosa or mouth causing infection [14].

People at High Risk for Developing Flu-Related Complications are children younger than 5, but especially children younger than 2 years old, pregnant women Adults 65 years of age and older, and residents of nursing homes and other long-term care facilities.

All the close contacts of confirmed cases and health care personnel were given chemoprophylaxis for a period of 10 days from the last exposure as per the guidelines of Ministry of Health and Family welfare[15].

The other preventive measures include: social distancing, prevention of the spread of infection in schools, practicing respiratory etiquette, use of facial masks, hand hygiene and use of chemoprophylaxis with antiviral drugs according to interim WHO guidance for the surveillance of human infection with swine influenza A (H1N1) virus. [16,17]

Retrospective analysis of quality care of medical facility and how to prevent avoidable deaths is the basic aim of verbal autopsy. Among various causes delay in seeking treatment, delay in referral, low suspicion index in the early phase of epidemic and associated co-morbid conditions were few important associated factors.

METHODOLOGY

From July 2017 to October 2017, 400 laboratory confirmed (by RT-PCR) cases of swine flu (H1N1 Influenza) were reported from Surat Corporation area and Tapi district, out of which 30 died. This study encompasses these deceased patients.

A pre tested questionnaire (also called as verbal autopsy form) was used to collect desired information. For getting information like epidemiological and socio-demographic data, visit to the residence of deceased person was done and family members and neighbor were also interviewed. In case deceased person's information still remained even after home visit then visit to respective hospital was also carried out.

The questionnaire includes information regarding age, gender, sex, occupation, presenting signs & symptoms, co -morbid medical conditions etc. First consultant and referral hospital's details, laboratory Investigations like hemoglobin, total count, platelet count, real time PCR for H1N1, time lag for starting Temiflu were also included. Statistical analysis was done using SPSS software version 20.

RESULTS

Out of total 30 patients, 18 (60%) were male and 12 (40%) were female. Approximately half of patients 14(46.6%) were more than 45 year of age (Table 1).

Out of total 30 patients, only 2 (6.6%) patients first seek treatment in outdoor, rest 28 (93.4%) directly admitted in indoor of hospitals whether private or government. Out of this 28, only 7 were admitted in isolation ward (Table 2).

About epidemiological linkage except one patient, all 29 patients had no epidemiological linkage.
As shown in table 3 more than half of the cases had associated co-morbid conditions.

Out of total 11 patients who were free from co-morbid conditions, 6 were children. That mean only 5 out of total 24 (20%) adult cases were free from any co-morbid conditions, rest 19(79.1%) patients had one or more co-morbid conditions.

Table 1: Age distribution of swine flu deaths

Age	Cases (n=30) (%)
0-18	6 (20)
18-45	10 (33.3)
45-60	7 (23.3)
>60	7 (23.3)

Table 2: Type of facility provided at first treatment facility

Type of facility provided at first place	Cases (n=30) (%)
Indoor	21 (70)
Isolation ward	7 (23.3)
OPD	2 (6.7)

Table 3: Co-morbid conditions present in swine flu patients

Variable	Cases (n=30) (%)
Co-morbid condition	
Hypertension	7 (23.3)
Diabetes	3 (10)
Ischemic Heart Disease	3 (10)
Thyroid disorder	1 (3.3)
Liver disorder	1 (3.3)
Asthma	1 (3.3)
OCD	1 (3.3)
Interstitial lung disease	1 (3.3)
Hepatic encephalopathy	1 (3.3)
Blind by both the eyes	1 (3.3)
CKD	1 (3.3)
No. of Co-Morbid Conditions	
Nil	11 (36.6)
Single	9 (30)
Double	3 (10)
Triple	1 (3.3)
Quadruple	1 (3.3)

Most common symptoms were breathlessness, fever and cough mainly productive. Fever was present in all patients. Next was breathlessness present in 26 (86.7%) individuals, then it is dry/ productive cough, present in 25(83.8%) individuals, productive cough was less common, present in 18(60%) individuals only. Rhinorrhoea was present in only 4 (13.3%) individuals. Sore throat was present in only 6(20%), quite less in comparison to the earlier studies. Very few had other symptoms like headache body ache chest pain, haemoptysis, loose motion, weakness, vomiting, tachycardia, tachypnoea etc.

X- ray finding: Out of total 30 patients, 6 didn't had X- ray picture, 1 had normal result while 1 was not investigated for x-ray. So out of the total 30 patients, 22 had x-rays plates and all of them showed signs of pneumonia. 10 (45.5%) cases showed total lung involvement (bilateral all lobe), 5(22.7%) had bilateral middle and lower lobe involvement, 3(9.9%) had bilateral lower lobe involvement and only 2(9%) had unilateral single or double lobe involvement of lung. Approximately 93.3 % of the patient showed either bilateral 2 or bilateral 3 lobes involvement. This may also be the reason behind high mortality.

Table 4: Common signs and symptoms

Symptoms	Cases (n=30) (%)
Fever low /high grade	30 (100)
Rhinorrhoea	4 (13.3)
Dry / productive cough	25 (83.3)
Headache	6 (20)
Sore throat	6 (20)
Breathlessness	26 (86.7)
Loose motion, vomiting	2 (6.6)
Altered behaviour	1 (3.3)
Chest pain	1 (3.3)
Haemoptysis	1 (3.3)
Poor oral intake	1 (3.3)
Tachypnoea	2 (6.6)
Tachycardia	1 (3.3)
Persistent vomiting	2 (6.6)
Rigor	1 (3.3)
Weakness	1 (3.3)
Yellowish discoloration of urine	1 (3.3)

Table 5: X-ray picture of the deceased cases

Lobes of lung	Cases (n=30)(%)
Bilateral all 3 lobes	10 (33.3)
Bilateral M&L	5 (16.6)
Bilateral lower	3 (9.9)
Unilateral single/ double lobe involvement	2 (6.6)
Bilateral mixed lobe involvement	3 (9.9)

About ventilator support, out of 30, 28 (93.3%) were provided ventilator support, information of 1 patient was not available and only 1 didn't get ventilator support.

In 29 patients out of 30, Hb, TC, DC, X-ray chest and throat swab was done. Additionally Echo was done in 2 patients, CT scan, ECG and LFT, RFT was done in one- one patient each. One patient's detail was not available.

Out of total 30, 13 patients came to hospital in their own, 10 came to hospital in ambulance. Out of these 10 cases, in 5 cases (50%), hospital was communicated before referral.

More than half of the patients 17 (56.6%) reported after 3days of onset of symptoms. Duration between hospital arrivals to receipt of Oseltamivir was quite fast, 13 (43.3%) patients received treatment within 24 hrs of arrival in the hospital. The rest who got Oseltamivir late, majority of them occur in initial phase of epidemic when suspicion index of swine flu was very low in both general population as well as medical fraternity. Duration between Oseltamivir to death was short, 13 out of 30 (43.3%) patients died within 2 days of taking treatment.

30 cases had 188 contacts, 131 were eligible contacts and all the eligible contacts were given chemoprophylaxis. Eligible contacts are those contacts that developed any sign or symptom of the disease during the episode of epidemic.

Staff coverage with chemoprophylaxis and biosafety measures use was 100%.

DISCUSSION

Age group 18-45 has maximum number of cases which is similar to other studies.[18.] The reason of higher mortality in this age group may be due to associated co-morbid conditions as well as decreased immune system. Also the assumption that elderly people has some degree of cross protection against H1N1 is not true here. In old age immune system was compromised. This leads to rapid increase in viral load. This caused poor response to treatment, and parallels to this, the co-morbid condition get worse, leading to multi-organ failure resulting in death. This finding was found in other studies too[19]. In this study no epidemiological linkage was found which is similar to other studies[20] .The most common co-morbid conditions were hypertension, diabetes and ischemic heart disease.

Ninety three percent of patients were admitted directly to indoor of the hospital; twenty five percent of all indoor admission was kept in isolation ward. This indicates the severity of the patient at the time first medical service and hence poor outcome of the patient.

Only 1 out of 29 patients was having epidemiological link others didn't have, this shows that now H1N1 may have taken the shape of seasonal influenza not pandemic influenza purely.

In this episode rhinorrhoea and sore throat were comparatively less common than breathlessness if we compare with previous studies [19] [20]. That means that this time involvement of lung was more and more severe, which perhaps the reason of higher mortality. (CFR was 7.5% this time, while last time it was nearly 6.4%. This is also reflected in the X-ray pictures which simulates with other studies. [21,22]

Among host factors of the deceased most of them were above 45, having single or multiple co- morbid conditions. Delay in seeking treatment, greater severity of involvement of lung, transfer of patient in critical conditions as well as low suspicion index in general population as well as clinicians in the ascending limb of epidemic were few important factors for poor prognosis of the disease.

One very positive finding was that no family member of deceased suffered from swine flu. This reflects the efficacy of chemoprophylaxis which was given through house to house coverage by health personnel of Surat corporation (local self government) .

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