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# Clinical Presentation and Final Outcome in Definite Cases of Influenza A (H1N1) in Kashan, Iran

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***Abstract***

***Background*:** Influenza A (H1N1) imposed a considerable burden on our health community. This study was conducted to evaluate the clinical and paraclinical pattern of the disease in influenza A (H1N1) patients in Kashan.

***Materials and Methods*:** This descriptive study was carried out on 87 definite cases of pandemic influenza A (H1N1) diagnosed from July to January 2009 in Kashan. The clinical and paraclinical information were collected and analyzed by SPSS-13.

***Results*:** The majority of patients were in age group 16-25 years and 50.6% of patients were male. The most common clinical symptoms were fever (92%), cough (78.2%) and dyspnea (54%). The most important paraclinical findings were: leokocytosis (41.3%) increased ESR (46.6%), positive CRP (48.7%). The mortality was seen in 8 patients (9.2%).

***Conclusion*:** Regarding to majority of death has occurred in patients with underlying disease, annual prophylaxis by influenza vaccine and early treatment to prevent of morbidity and mortality is recommended.



New human influenza disease due to H1N1 virus has emerged as a pandemic from the first 2009. The disease was first diagnosed in Mexico in May 2009 and shortly after that world has witnessed its rapid and global spread to almost all countries. Pandemic influenza has been considered to cause grater morbidity and mortality than seasonal influenza, particularly among young adults. Seasonal influenza is an acute viral and self limited disease resulting from influenza virus type A, B, C [1-3].

In Calitri et al. study on 63 children, fever, cough and dispend was the most clinical feature of influenza [4]. Ugarte et al. study reported the fever, cough, dyspena and myalgia as the most symptoms and 132 deaths among 12,248 confirmed cases [5]. Moghadami et al. also investigated 297 confirmed cases of influenza and reported 11 deaths [6].

In order to provide a better management and preventive plan for this pandemic a thorough and concise evaluation of the pattern of spread and age and sex distribution of the disease seems inevitable. On the other hand, lack of new information about this emerging disease in our country was the most important obstacles. So we aimed to investigate the epidemiologic, clinical and paraclinical pattern of disease in Kashan which was one of the hot points of H1N1 influenza in Iran. The result of this study could be helping us to dealing with future epidemics.

## Materials and Methods

This descriptive study was carried out on 87 confirmed influenza A H1N1. All admitted patients to the health care centers and hospitals of Kashan (Kashan, Iran) from July 2009 through January 2010 with symptoms of influenza-like illness (ILI) were enrolled. After obtaining consent form, a nasopharyngeal swab or nasal aspirates were sent to national laboratory of health ministry of Iran for doing real-time reverse-transcriptase polymerase chain reaction (RT-PCR). The demographic and clinical and physical findings by interviewing and examining patients were collected.

Questionnaires included information about age, gender, nationality, job, underlying chronic disease, history of travel and exposure to influenza patient, presenting clinical symptoms and signs, laboratory examination, outcome of infection were filled. Validity and reliability of questionnaire was confirmed by expert pane. Data were analyzed by SPSS-13 and presented as descriptive results.

## Results

All people with influenza like illness (ILI) referring to health care centers and hospitals of Kashan were 948 (469 male and 479 female). From 948 patients 851 were hospitalized and the rest managed as outpatient.

Only 87 patients (80 inpatient and 7 outpatients) with ILI and testing positive for H1N1 influenza virus infection, using real-time reverse transcriptase polymerase chain reaction on nasopharyngeal swab or nasal aspirates positive enrolled in this study. The demographic and epidemiological characteristics and outcome of the 87 patients enrolled in this summary are listed in table 1. The median age of patients was 30.1±18.5 years (max 83 year and min 2 month). Thirty one percent of patients were in 16-25 year age group, which was the most common involved age group. There was history of exposure to definitive case of influenza in 15% of patients. Two percent of patients had received the seasonal 2009-2010 vaccination. The duration of hospital stay in majority of patients (58.8%) were 1-3 day. The median time of hospital stay was 4.13±2.7 day (Max: 14 Min: 1).

Twenty-six (29.9%) patients had at least 1 co-morbidity, including cardiovascular disease 5 (19.2%), chronic lung disease 4 (15.4%), chronic renal disease 7 (26.9%), diabetes 3 (11.5%), cancer 1 (3.8%), chronic liver disease 1 (3.8%) and other disease 5 (19.2%).

All patients had more than one symptom. The most common presenting symptoms was: fever 80 (92%), followed by cough 68 (78.2%), dyspnea 47 (54%). The most common physical finding was fever 69 (86.3%), followed by tachycardia 54 (67.5%), tachypnea 37 (46.3%). There were gastrointestinal manifestations, such as nausea and vomiting 39 (44.8%), diarrhea 8 (9.1%), and abdominal pain 11 (12.6%). The most common laboratory findings were positive CRP (48.7%), increased ESR 34 (46.6%) leukocytosis 33 (41.3%) and leucopenia 10 (12.5%), thrombocytopenia 16 (20%), elevated level of lactate dehydrogenate (LDH) 14 (73.7%). Out of 87 cases, 8 patients died (fatality rate 9.1%). The mean age of them was 46.9±27.94 year. Which in comparison with cured patients 30.1±18.5 years was higher but this difference was not significant in Mann-Whitney *U* test.

**Table 1.** Distribution of demographic characteristics cases of influenza A (H1N1)

| Variables | | N (%) |
|---|---|---|
| Sex | Female | 43 (49.4) |
| | Male | 44 (50.6) |
| Age (yrs) | ≤5 | 9 (10.3) |
| | 6-15 | 5 (5.7) |
| | 16-25 | 27 (31) |
| | 26-35 | 15 (17.2) |
| | 36-45 | 17 (19.5) |
| | ≥46 | 14 (16.1) |
| Job | Housekeeper | 27 (31) |
| | Employee | 6 (6.9) |
| | Shopkeeper | 26 (29.9) |
| | Retired | 3 (3.4) |
| | Unemployed | 14 (16.1) |
| | Student | 11 (12.6) |
| Nationality | Iranian | 84 (97) |
| | Afghani | 3 (3) |
| Residency | Urban | 78 (90) |
| | Rural | 9 (10) |
| Underlying disease | Yes | 26 (29.9) |
| | No | 61 (70.1) |
| Duration of hospitalization (days) | 1-3 | 47 (58.8) |
| | 4-6 | 21 (26.2) |
| | >6 | 12 (15) |
| Out come | Recovery | 63 (72.4) |
| | Death | 8 (9.2) |
| | Incomplete treatment | 16 (18.4) |

## Discussion

In these survey 87 patients with influenza A (H1N1) were studied, involvement of both sexes was nearly identical. The majority of patients were Iranian, young and urbanites. The most common clinical symptom was fever cough and dyspnea.

In study of Li and Ma 48 of cases was male and 27 was female [7]. In another study in China on 155 patients 90 (58.1%) were male [8]. The involvement of male 148 (49.8%), and female 149 (50.2%) in study of Moghadami et al. like our study, was nearly identical [6]. There was no sex preference in influenza. Regarding to influenza A (H1N1) was an emerging disease, all people were susceptible, and so this no sex difference is acceptable.

The most common physical finding was fever, tachycardia and tachypnea. In study on 63 children fever and tachypnea was the most common [4]. The most important physical finding in influenza is fever which usually rapidly increases up to 40ºC [9].

In our study the mean age of patients was 30.1±18.5 years. The most patients were young and the elderly had lowest rate of disease (only 2 patients>76 years). In study of Nguyen-Van-Tam et al. also the most patient were young (36% under 16 years and 5% ≥ 65 years) [10]. In study of Champunot et al. on 24 hospitalized patients, the mean age was 39.5 year [11]. To et al. studied 186 influenza cases which 75% of influenza A (H1N1) was under 50 years [12]. According above mentioned studies, the most patients in pandemic influenza A (H1N1) was the young adult which can be due to partial immunity of elderly resulting from past exposure in previous pandemic influenza [13].

The mean of hospital stay was 4.13±2.7 days, this was 4 and 5 days in other studies [5, 11] which are compatible with our study, so the hospital stay is the same duration of disease if no complication occurs [9].

The most common clinical symptoms were fever, cough and dispend. Li and Ma and To et al. also reported these symptoms as the most common symptoms like our study [7, 12], the cough is the most common and troublesome symptom of influenza [9].

The most prominent laboratory findings were positive CRP, increased ESR and leukocytosis which these are markers of acute bacterial infection and their increase in influenza is unusual. Thrombocytopenia was found in 20% and increased keratinize in 20%, increased liver function test (LFT) in more than 80%, increased creatine phosphate kinase (CPK) (29.5%), LDH (73.7%). Ugarte also reported these changes [5]. LDH was an independent risk factored for death [8]. In absence of mystic or myocarditis increase of CPK, LDH and LFT is important and check of them in Influenza should be considered.

Twenty-six (29.9%) patients had at least one comorbidity, the most common co morbidity was chronic renal failure. Study of Ugaret et al. showed 59% of patients had underlying disease which 25% of them were chronic renal failure [5]. Calitri et al. reported that 29 (46%) of their patients had co morbidity [4].

In present study 7 of 8 (87.5%) dead patients had underlying disease. Present study is relatively in accordance with that reported by Yang et al. which 50% of dead patients had underlying disease [13]. According to fisher exact test there was found significant statistical correlation between final outcome and preexisting co morbidity.

Recovery was complete in 79 (90.8%) patients and 8 (9.2%) of patients died which 2 (22.2%) were in age group ≤5 years old. There was no seen death among patients 6 to 25 years. Li and Ma and Champunot et al. reported only one death [7, 11] but 14.5% of patients died in study of Yang et al. [13]. In other study in southern of Iran 11 (3.7%) out of 297 definitive case died [6]. The mortality seen in our study is significantly higher than other studies preexisting co morbidity, delay in diagnosis and treatment may be important factors in different rate of death in different studies.

According to higher occurrence of mortality in individual with preexisting co morbidity, preventive measures through annual influenza vaccination and rapid treatment should be done in persons with underlying disease to prevent of mortality and morbidity of new emerging influenza virus.

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### Authors' Contributions

All authors had equal role in design, work, statistical analysis and manuscript writing.

### Conflict of Interest

The authors declare no conflict of interest.

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