Clinical and Epidemiological Characteristics of Novel AH1N1 Flu

Nada Koluder, Meliha Hadžovic-Cengic, Refet Gojak, Amir Hadžić, Enra Lukovac
Clinic for Infectious Diseases, University Clinical Center Sarajevo

1. INTRODUCTION

Swine flu is acute respiratory infection caused by influenza A H1N1 virus. In medical literature is described as: influenza A of swine origin, swine influenza A (H1N1), influenza A/California/H1N1, North American flu and influenza A (H1N1/09). H1N1 represents genetic combination of viruses of avian, human and swine flu (1). Public health officials in USA discover new type virus in April 2009. World Health Organization (WHO) fast spreading of new virus throughout the world acknowledged in June 2009 when sixth degree of Pandemic swine influenza is declared (2). Contrary to typical swine flu related to swine, new recombinant virus is transmitted mainly by aerosol and by contaminated hands on contact with eyes, nose and mouth mucosa. Flu viruses can live on outer surfaces for several hours, e.g. viruses in saliva after sneezing. There is no evidence of transmitting swine flu by consuming pork meat. Virus is reproduced in respiratory epithelial cells, this leads to inflammation of large numbers of epithelial cells and transmission to other organs as well as developing of disease symptoms. People with H1N1 can infect others up to 7 days after their infection by virus, even if they did not develop symptoms of disease (3). Severity of problem imposed by pandemic requires epidemiological and clinical investigation to mark risk groups of patients infected with H1N1. This would shorten length of stay in hospital or administration of oseltamivir (3).

2. OBJECTIVE

The main objective is to present epidemiological and clinical characteristics of patients with proven influenza A H1N1 hospitalized at Clinic for Infectious Diseases Sarajevo during 4 months period (October 2009 until end January 2010).

3. SUBJECTS AND METHODS

At Clinic for Infectious Diseases during four month period 1769 patients with flu symptoms was examined, 400 were discovered positive by PCR method, with 269 patients hospitalized. During our work 127 available medical records of patients with positive pandemic influenza A/H1N1 were analyzed retrospectively. Disease was confirmed clinically and microbiologically by nasal swab (PCR method). Patients were classified according to sex, age and severity of clinical status at admittance. We analysed lenght of disease prior to hospital treatment as well as hospital stay. For analysis at admittance important clinical finding was cough and dyspnea. According to medical history data about comorbidity analysed patients were classified into four groups: pulmonary...
patients hospitalized at Clinic for Infectious Diseases with confirmed AH1N1 flu.

3. Results

On Diagram 2 distribution of H1N1 flu patients according to age groups, where age range 25-45 dominates. Male patients prevail (57%).

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4. RESULTS

In retrospect from available patients charts, clinical and epidemiological data of 127 patients hospitalized at Clinic for Infectious Diseases with confirmed AH1N1 flu were investigated.

On Diagram 1 we can see that female patients prevail (57%)

On Diagram 2 distribution of H1N1 flu patients according to age groups, where age range 25-45 dominates.

Diagram 3 represents clinical status rated according to severity, where moderate clinical picture is most frequent (71.55%), followed by severe (40.31%) and mild clinical status (17.13%).

Chi-square test did not show significant dependency between severity of disease and chest radiography $C^2 (2, n=128) = 4.996 p = 0.0758$.

Chi-square test showed significant dependency between severity of disease and dyspnea $C^2 (2, n=128) = 8.848 p = 0.004$.

Chi-square test did not show significant dependency between severity of disease and cough $C^2 (2, n=128) = 4.504 p = 0.12$.

Impact of prehospital length of disease on severity of illness was investigated by factor analysis. No significant difference was found $p = 0.38$.

Impact of length of hospital days on disease on severity of illness was investigated by factor analysis. No significant difference was found $p = 0.4$.

Impact of patients’ age on severity of illness was investigated by factor analysis. Significant difference was
found on level \( p = 0.042 \). Binary logistic regression was used to investigate dependence of sex, age, day of illness, comorbidity and disease severity. Comment: Only age has impact on severity of disease (\( p<0.05 \)) while sex, day of disease and comorbidity do not have significant impact. Severity of disease depends on age (\( p = 0.033 \)). Odds ratio is 1.029 (1.002-1.057), every year of age increases risk of more severe disease by 2.9%.

5. DISCUSSION

H1N1 type influenza A virus represents genetic combination of avian, human and swine viruses. Given the specificity of genome caused large alarm in world, therefore in June 2009 pandemic was declared. Epidemiological way of spreading did not differ much from seasonal flu (droplets). Clinical manifestation A H1N1 viral infection were manifested in several forms.

Mild form of influenza AH1N1/09 is manifested as acute uncomplicated respiratory disease followed by fever over 38°C, chills, headache, upper respiratory cattarh (cough, headache, rhinitis), myalgia, vomiting, fatigue, diarrhoea. Moderate form of AH1N1/09 had more accentuated symptoms of mild form of disease with signs showing complication of flu (problems with breathing, shortness of breath, chestpain or pressure, disorientation, confusion, relapse of symptoms after initial improvement).

Sever form of disease caused by infection of novel AH1N1 virus varies from moderate forms of lower respiratory disease, dehydration, pneumonia to serious outcomes including respiratory insufficiency and death. Severity criteria includes tachypnea (not caused by fever), fever over 38°C, dyspnea, hypotension, pathological chest X-ray.

In investigated population representation with regard to sex of patients was predominantly female compared to male (57% vs. 43%) with age of 25 to 45 years (Diagram 1 and 2). Consulted literature quotes vulnerability of middle age group due to lack of residual immunity from previous immunisations (7).

As showed on Diagram 3 our results shows domination of moderate form of new flu (71.55%), followed by severe form (40.31%) and at the end mild form of disease. (17.13%) (Diagram 3).

Comparing data about sex and severity of disease we found interesting data about statistical dependency (\( p=0.010 \)). Severe form of disease is present at 40% of males, while the 24.7% of severe disease is present at female group, data that hasn’t been analyzed in available references (Diagram 4).

Expected results of comorbidity impact based on which patients were divided into 4 groups did not show significant correlation with disease severity (\( p>0.05 \)) (Diagram 5) while the references show (4, 7, 8). From group of patients characterized as severe form of disease on admittance main symptom was dyspnea (60%) (Diagram 6), and relation between dyspnea and severity of disease was confirmed (65%) but not relation with cough which was leading symptom regardless of disease form (6).

We did not find significant correlation between severity of disease and positive chest radiography with pneumonitis or bacterial superinfection. In accordance to this, and considering new situation throughout the world there wasn’t antibiotic doctrine for therapy. (5) This could have had impact on hospital stay but no significant difference was found between lengths of hospital stay and disease forms (Diagram 10). Average day of admittance to hospital was third day of disease which correlates with reference data of start oseltamivir treatment. Once more it is confirmed that initiation of therapy in the first 48 hours impacts disease outcome. (Diagram 9) (4, 5). It is showed in this paper that age had significant impact on severity of disease with average of 3% for every year of age. Patients with mild form of disease were average 29,65 ± 12.49 years of age, 33.68 ± 16.15 with moderate and 39.52 ± 13.10 with severe form of disease (Diagram 11). Probability analysis showed that severe form of disease is impacted by age, while sex, prehospital lenght of disease and comorbidity were not significant (Table 1).

6. CONCLUSIONS

Among hospitalized AH1N1 patients middle age females are more represented with moderate form of disease. There is a statistically significant relation between severity of disease and sex. In male group 40% of patients has sever disease, while this number is 24.7% in females. We did not show significant dependence between severity of disease and comorbidity Significant dependency between severity of disease and dyspnea is found, while this is not the case with cough. We did not show significant correlation between severity of disease and chest radiography confirmed pneumonitis. There is no statistically high correlation between median of prehospital lenght of disease and lenght of hospital stay. There is a significant impact of age on severity of disease, where every year of age increases risk of more severe form of disease for 2.9%.

REFERENCES