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Epidemiology of A (H1N1) Pandemic 2009 Influenza Virus Infection in Erbil City/ Iraq

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Abstract

Background and objectives: Influenza virus really became a challenge throughout the world. Erbil, the capital of Kurdistan, Iraq, is likely to face increasing challenges of preventing communicable diseases including influenza and outbreaks. This study aims to investigate the clinical profile & outcome of (H1N1) pandemic 2009 influenza virus infection referred influenza center in Hawler teaching hospital in Erbil city. Objectives of this study include: determining the frequency of positive cases of H1N1 among suspected cases, by demographic features, and finding out the outcome of positive cases of H1N1in terms of case fatality rate. **Methods:** This is a case series study, carried out in Erbil city, using medical charts of 365 suspected a (H1N1) pandemic 2009 cases referred to influenza center in Hawler teaching hospital during pandemic 2009. Positive cases diagnosed by polymerase chain reaction. The Statistical Package of Social Science software, version 19.1was used for data entry and analysis; P-value ≤ 0.05 was regarded as statistically significance. **Results:** The H1N1 positive cases are found during epidemic 2009; by viral culture, out of 365 suspected cases, only %12.6) 46) cases found to be positive and affected both sexes equally. Commonest symptoms are including fever (%1.9), sore throat & cough (%1.4) and rhinorrhea (%1). Case fatality rate of H1N1 was %6.5, (p value=0.007). **Conclusions:** H1N1 positive cases are found during epidemic 2009. Patients had minimum symptom of the disease at presentation. Only %2.17 of patients intubated and mechanically ventilated. The death rate was only %6.5. Crowded sectors inside big city may be regarded as a risk factor for disease transmission.

Keywords: H1N1, influenza, epidemic, Erbil, Iraq.

Introduction

H1N1 pandemic discovered first time at April 2009 spread, epidemiology, and clinical data [1]. Approximately one quarter to one half of patients with 2009 H1N1 virus infection who were hospitalized or died (nearly 91 patients) had no reported co-morbid diseases2. Most of them reported history of flu-like illness (pyrexia, tachypnea), that was generally mild but in others was severe. Although most of the cases of H1N1 virus infection have cough or flu, some of the patients have features of dysfunctions of other systems (e.g. gastro intestinal and central nervous system) [2].

Patients with concurrent respiratory diseases or pregnant ladies and metabolic syndrome cases confine large proportion of intensively followed patients[3]. Laboratory samples was including sputum, nasal or deeper nasopharyngeal swabs, and bronchio-alveolar aspirates with using real time polymerase chain reaction test for the diagnose[4].

The following protocols are currently available:

Influenza A type-specific conventional and real-time PCR pandemic (H1N1) 2009 virus specific conventional and real-time-PCR.

CDC realtime RT-PCR (rRT-PCR) protocol for the detection and characterization of pandemic (H1N1) 2009.

Seasonal influenza A (H1N1 and H3N2) and avian influenza A (H5, H7 and H9) realtime RT-PCR.Other like stool sample appear to be useless.5 Serologically rising titer of antibody or sero conversion might be diagnostic2. Anti-viral treatment with oseltamivir might get some benefit; main core of treatment is supportive[4].

Influenza virus really became a challenge throughout the world. Erbil, the capital of Kurdistan, Iraq, is likely to face increasing challenges of preventing communicable diseases including all kind of viral infections. Little information exists on the incidence of the H1N1 in Erbil. Such data are important for planning national communicable disease treatment and prevention programs. We have no accurate data, but possibly

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what is observed from hospital records shows that influenza is one of first ten diseases that lead to death in the past 1. Based on these figures, authors hypothesize that H1N1 influenza occurred in Erbil city during pandemic 2009. The authors therefore conducted the present study to investigate the clinical profile & outcome of A(H1N1)pdm09 influenza of suspected patients in Erbil city that was referred to influenza center in Hawler teaching hospital between the periods from 1st of June 2009 to 7th of March 2010. The objectives of this study include: determining the frequency of positive cases of H1N1 among suspected cases, determining the frequency of positive cases of H1N1 by demographic features, like (age groups, gender, occupation, etc.), and finding out the outcome of positive cases of H1N1in terms of case fatality (Mortality) rate.

Materials & methods

This is a case series study, include all the secondary data of suspected A(H1N1)pdm09 cases referred to & registered at influenza center in Hawler teaching hospital in Erbil city during 1st of June 2009 to 7th of March 2010. Data collected using medical charts of 365 suspected a (H1N1) pdm09 cases. All the secondary data of suspected cases referred to H1N1 influenza center in Hawler teaching hospital during the pandemic period at 2009 included in the study & analyzed statistically.

During the epidemic 2009, medical charts are used for all suspected cases referred to the center; the charts included the data of: history taking, physical examination & laboratory investigations, treatments required & outcome of all cases.

Physical examination included general examinations (vital signs, weight & height, blood pressure, respiratory rate and pulse rate) and respiratory system examination.

Hematological and biochemical tests were done. The blood samples were taken by a trained laboratory technician and centrifuged directly after collection and the serum either immediately analyzed or stored at ≤ -20°C in the laboratory of Hawler teaching hospital. Sputum examination was done in the laboratory of Hawler teaching hospital. All the samples sent to WHO laboratory in Egypt for viral culture with egg yolk viral culture media, or real time polymerase chain reaction7.

Chest X-ray, posterio-anterior (PA) view, in standing position, was taken. for certain cases, computerized tomography (CT) scan of chest was taken.

The Statistical Package of Social Science software (SPSS, version 19.1) was used for data entry and data analysis; appropriate statistical tests for both categorical and numerical variables were used. P-value ≤ 0.05 was regarded as statistically significant.

The research protocol was reviewed and approved by Ethical Committee of the College of Medicine, Hawler Medical University. The anonymity of the participants was preserved.

Results

Out of 365 suspected referred cases, only %12.6) 46) cases are found to be positive, Table 1.

Table (1): Frequency distribution of cases, n=365.

Cases	Frequency	Percentage
Negative	319	87.4%
Positive	46	12.6%
Total	365	100%

In this study, the proportion of positive cases was (13.9%) among females and (11.5%) males (P value =0.528) Table2. Most patients referred to H1N1 center were living inside Erbil city, 273(74.8%) versus 92 (25.2%) who are living outside Erbil city.

Table (2): Association of test results by gender, n=365.

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Test results	Male	Female	Total	P value
Negative No. (%)	177 (88.5%)	142 (86%)	319 (87.3%)	
Positive No. (%)	23 (11.5%)	23 (13.9%)	46 (12.6%)	0.528
Total No. (%)	200 (100%)	165 (100%)	365 (100%)	

The proportion of positive cases was more among age groups of more than 45 years old (%15.3), but again with no statistical significance between positive cases and age groups, (P value =0.545) Table 3.

Table (3): Association of test results by age groups, n=365.

Test results	Age Groups				Total	P value
	1-4	5-14	15-45	>45		
Negative No. (%)	35 (94.5%)	39 (86.6%)	201(87%)	44 (84.6%)	319 (100%)	
Positive No. (%)	2 (5.4%)	6 (13.3%)	30 (12.9%)	8 (15.3%)	46 (100%)	0.545
Total No. (%)	37 (100%)	45 (100%)	231 (100%)	(100%)	365 (100%)	

Table 4 shows the proportion of positive cases among all symptoms with statistical significant associations. Common respiratory symptoms which are mention in the table.

Table (4): Proportion of positive cases by Symptoms

Symptoms		Negative		Positive		P value
		No.	%	No.	%	
Fever	Yes	258	98.1%	5	1.9%	
	No	61	59.8%	41	40.2%	<0.001
Rhinorrhea	Yes	200	99.0%	2	1.0%	
	No	119	73.0%	44	27.0%	<0.001
Sore throat	Yes	211	98.6%	3	1.4%	
	No	108	71.5%	43	28.5%	<0.001
Cough	Yes	248	98.8%	3	1.2%	
	No	71	62.3%	43	37.7%	<0.001
Myalgia	Yes	181	99.5%	1	0.5%	
	No	138	75.4%	45	24.6%	<0.001
Diarrhea	Yes	47	97.9%	1	2.1%	
	No	272	85.8%	45	14.2%	0.01
Headache	Yes	157	99.4%	1	0.6%	
	No	162	78.3%	45	21.7%	<0.001

Regarding the outcome of positive cases, case fatality rate was (%6.5) out of 46 positive cases versus (%0.3) of negative cases with statistical significance between test results and disease outcome, Table 5.

Table (5): Test result by disease outcome, n=365.

Test results	Disease outcome			P value
	Cured	Died	Total	
Negative	%99.7) 318)	%3.) 1)	%100.0) 319)	
Positive	%93.5) 43)	%6.5) 3)	%100.0) 46)	0.007
Total	%98.9) 361)	%1.1) 4)	%100.0) 365)	

Table 6 shows that among positive cases none of them are found to have pneumonia whereas %13.6 of positive cases are found to be free of pneumonia with significant associations between test results and pneumonia. Regarding chest X-ray, none of positive cases are found to be abnormal whereas, only %13.4 of positive cases are found to be normal.

Table (6): Clinical characteristics of the patients, n=365.

Clinical characteristics		Test Results			P value
		Negative	Positive	Total	
Pregnancy	Yes	2(100%)	0(0.0%)	2(100.0%)	0.764
	No	317(87.3%)	46(12.7%)	363(100.0%)	
COPD	Yes	3(100%)	0 (0%)	3(100%)	0.667
	No	316(87.3%)	46(12.7%)	362(100%)	
Cancer	Yes	2 (100%)	0 (0%)	2 (100%)	0.764
	No	317(87.3%)	46(12.7%)	363 (100%)	
DM	Yes	6(100%)	0(0%)	6(100%)	0.443
	No	313(87.2%)	46(12.2%)	359(100%)	
CVD	Yes	8(100%)	0(100%)	8(100%)	0.337
	No	311(87.1%)	46(12.9%)	365(100%)	
Epilepsy	Yes	2(100%)	0(0%)	2(100%)	0.764
	No	317(87.3%)	46(12.7%)	363(100%)	
Asthma	Yes	6(100%)	0(0%)	6(100%)	0.443
	No	313(87.2%)	46(12.8%)	359(100%)	
Pneumonia	Yes	26 (100%)	0(0%)	26(100%)	0.027
	No	293(86.4%)	46(13.6%)	339(100%)	
Abn. CXR	Yes	22(100%)	0(0%)	22(100%)	0.047
	No	297(86.6%)	46(13.4%)	343(100%)	
IMV	Yes	0(0%)	1(100%)	1(100%)	0.874
	No	318(87.4%)	46(12.6%)	464(100%)	

Discussion

In this study, a total of 365 suspected cases admitted to H1N1influanza unit in Erbil city, 165(45.2%) were females and 200 (54.8%) were males. Out of all 46 positive cases (12.6%), both males & females are equally positive (p value=0.53). This result is nearly the same as many studies done which showed no significant differences between infection rates between males & females[5-6].

Age distribution ranging between 15-45 years old (80%) (p value <0.54). This finding is correspondent to other study in 2013 in nearby region which reveal same age distribution[7].

Most of the patients were from inside Erbil city (75%), most of them inhabitant in crowded sectors of the city. Proportion of positive cases among urban population was 75% while among rural population was 25%. Overcrowding regarded as a risk factor. Proportion of pregnant ladies reported to be only 2 cases (p value <0.764) appear to be lower than others finding 9. Nearly 37% in this study cases having underlying disease example. (asthma 6 cases, COPD 3 cases, congestive heart failure, diabetes mellitus 6 cases , epilepsy 2 cases, cancer 3 cases…etc.), possible any comorbid condition with deterioration when consulted a medical management during pandemic were referred to H1N1 unit but fortunately all of them found to be test result negative, while others showing 56-87% [5,9-10].

Commonest symptoms among positive cases including fever (1.9%) (p value <0.001), sore throat & cough (1.4%) and (1.2%) respectively (p value

<0.001) and rhinorrhoea (1.0%) (p value <0.001). All of them were statistically significant resembling others findings [8-9, 11-12].

But overall symptoms were common among negative test result group possibly because negative cases were larger in number. Most of positive cases are found to be free from symptoms during presentation. It may be due to the fact that they were presented in an early stage of infection with H1N1, full picture of the disease not yet developed or this may be attributed to the awareness of population about the disease by media. Again this might explain lower rate of the mortality reported in this study as compare with the others[13].

Pneumonia affecting 26 cases (p value <0.027) was statistically significant. Because this infection commonly affects respiratory system, or pneumonic cases may be wrongly admitted to H1N1 unit during pandemics, exactly like that observed by the others [16].

Among all the patients who had chest X ray, 22 of them had abnormal findings like; (consolidation, reticulonoduler shadow unilaterally, butterfly appearance bilaterally) as chest X ray finding among those cases (p value <0.047) statistically significant, nearly the same have been recorded by the other studies[9,13].

Intensive care unit admission and invasive ventilation required in only one case (2.17%) (p value <0.874), while others record higher percentage 25% [13] of had been admitted to Intensive care unit . This might reflect the under use and poor availability of mechanical ventilation in Hawler center. Case fatality rate of the disease were 3 patients (6.5%) (p value <0.007), which is lower than Argentina study 13%[16].

Conclusions

H1N1 positive cases were found during epidemic 2009. Most of the cases were presented in an early stage of H1N1 infection with minimum symptoms. Only 2.17% cases intubated and mechanically ventilated. Mortality rate was 6.5%. Crowded sectors inside big city may be regarded as a risk factor for disease transmission and outbreaks. Authors are recommending the health authority in Erbil to use such data for planning of national communicable disease treatment and prevention program.

References

1- Vladimir T, Hossein K, Raul R. Geographic Dependence, Surveillance, and Origins of the 2009Influenza A (H1N1) Virus. N Eng J Med. 2009; 361; 2: 115-9.

2- Al-Muharrami Z. Understanding the Influenza A H1N1 2009 Pandemic. SQU MED J. 2010;10(2):187-95.

3- Al-Lawati J, Al-Tamtami N, Al-Qasmi A, Al-Jardani A, Al-Abri S, Al Busaidy S. Hospitalized patients with Influenza A (H1N1) in the Royal Hospital, Oman.SQU MED J. 2010;10(3):326-34.

4- Ali A, Sidgi S. Influenza A (H1N1) 2009 To vaccinate or not to vaccinate? SQU MED J. 2009;9(3):224-9.

5- Kim M, Song W, Jung J, Kwon J, Kim T, Lee S, et al. Clinical Course Of Asthma Patients With H1N1 Influenza Infection, AJRCCM. 2011;183(1):.123-8.

6- Namendys S, Rivero S, Dominguez C. Acute respiratory distress syndrome induced by pandemic H1N1 2009 influenza A virus infection. Am J Respir Crit Care Med. 2010;182(6):857-63.

7- Mohammed O, Kosar M, Ali M, Ahmed S, Aumaid U. Clinical and laboratory characteristics of H1N1 infection in Sulaimani during the global pandemic in 2010. Merit Res J Med Med Sci. 2013;1(5): 60-5.

8- Jung JA, An HS, Choi EJ, Yun HJ, Kim JH. Clinical Features Of Respiratory Viral Infections During 2009 Influenza A(H1N1) Epidemic Period, Am J Respir Crit Care Med 2011;183;(4):918-22.

9- Abdullah B. The Struggle Against Pandemic Influenza A (H1N1) 2009. SQU MED J. 2009; 9(3):257-60.

10- Mauad T, Hajjar LA, Callegari GD, da Silva LF, Schout D, Galas FR, et al. Lung pathology in fatal novel human influenza A (H1N1) infection. Am J Respir Crit Care Med. 2011;181(1):72-9.

11- Patarroyo GD, Patarroyo MM, Prad AC, Simbaqueba CA. Initial Clinical Presentation Of Patients With Confirmed 2009 Influenza A (H1N1) Compared With Patients With Common Cold .Am J Respir Crit Care Med. 2010;181:(2)619-22.

12- Patarroyo GD, Patarroyo MM, Prada AC, Sanabria OO. Clinical Presentation Of patients With Confirmed Diagnosis of 2009 Influenza A (H1N1) Admitted to the Medical Intensive Care Unit In Bogota, Colombia, Am J Respir Crit Care Med. 2010;181;(2)620-2.

13- Corral J, Aquilia S, Miglioranza C, Hualde M, Corral G, Rosati M, et al. Multi centric Study Of Hospitalized Patients Affected By H1N1 Influenza In Mar Del Plata, Argentina, During The June To August 2009 Period, Am J Respir Crit Care Med. 2010;181;(2):616-8.

14- Kharma N, Gerstein R, Kumar A, Sharma S. Chest Radiographic And Ct Findings In Pandemic Influenza A (H1N1) Virus Infection, Am J Respir Crit Care Med. 2011:183;(4)820-4.

15- Nikhanj NS, Lam J, Ngab T, Tennant R, Sircar A, Shahedi K. Severe Pandemic H1N1 2009 Infection Requiring Intensive Care: A Case Series, Am J Respir Crit Care Med. 2010:181; (2)219-21.

16- Fadl MH, Guzman J. ARDs Secondary to Influenza; Single Center Analysis of Outcomes of the 2009 H1N1Pandemic versus the 2010-2011 Seasonal Influenza, Am J Respir Crit CareMed. 2012:185; A1654-8.