Respiratory Physiology & Neurobiology 187 (2013) 94–98

Contents lists available at SciVerse ScienceDirect

Respiratory Physiology & Neurobiology

journal homepage: www.elsevier.com/locate/resphysiol

Review

Pandemic influenza in the 2009/2010 season in central Poland: The surveillance study of laboratory confirmed cases☆

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ARTICLE INFO

Article history:
Accepted 18 February 2013

Keywords:
A(H1N1)pdm09
Human flu
Social factors

ABSTRACT

We retrospectively studied confirmed cases of influenza obligatorily reported to health authorities in central Poland during the 2009/2010 season. Each case was traced and examined with a questionnaire. The samples were tested for influenza A and B by RT-PCR. A total of 561 cases of influenza, including 185 in children under 14 years old, were detected. Four hundred and eighty four people were hospitalized, including 142 children under 14. Thirty two patients died, all with pre-existing risk factors. The most common complications were pneumonia, cardiac arrest, septic shock, circulatory insufficiency, multi-organ failure and myocarditis. The majority of patients (388/484) were treated with oseltamivir. Fifty three patients were mechanically ventilated, 52 patients were given oxygen. Only 11 out of the 561 patients were immunized against seasonal influenza. In conclusion, pandemic influenza affects all age groups, but it is more common in younger patients. Pandemic influenza is becoming an emerging health risk for the Polish population.

1. Introduction

The first cases of a new strain of H1N1 influenza A were observed in Mexico in March 2009. Most of the patients had general flu-like symptoms such as fever, cough and sore throat, but some of them exhibited serious respiratory infection (Perez-Padilla et al., 2009). Later, the outbreak spread rapidly to the USA. A virus responsible for cases in California was found to be a new strain of the influenza A virus of swine origin. The virus was initially referred to as 'swine flu' because there was a strong suspicion that the primary source came from pigs. The WHO confirmed that the new virus was responsible for severe airway infections or pneumonia and was possibly the cause of several deaths, raising the level of pandemic alert from phase 3 to phase 4 in April 2009. Then infections with the new virus were noted in Canada and the first EU countries, the UK and Spain (WHO, 2010). The WHO raised the level of pandemic alert to phase 5 due to confirmation of human-to-human transmission in Mexico and the USA at the end of April 2009 (WHO, 2010). The number of confirmed cases in Spain, UK, and outside the EU was increasing rapidly and the first cases were registered in Poland in May 2009. European Center for Disease Prevention and Control (ECDC) was concerned that people aged 14–55 were more affected than people over 65, which is different from the usual outbreak of seasonal influenza (ECDC, 2010). The WHO declared the pandemic on 12th June 2009 (WHO, 2010). The pandemic influenza was described as a 'mild pandemic' and the virus turned out to be an assortment of two swine strains, one avian and one human strain. During the 2009–2010 influenza season, almost all cases of influenza in Europe were caused by the pandemic virus A(H1N1)pdm09 (ECDC, 2010). Nearly all isolates were antigenically similar to the A/California/7/2009 strain, which was later selected for the seasonal influenza vaccine 2010–2011 (Fiore et al., 2010).

The first confirmed case of the A(H1N1)pdm09 influenza infection in Poland was observed in a 52-year-old woman who came from Pennsylvania, USA on May 2, 2010. There were 2798 cases of laboratory-confirmed A(H1N1)pdm09 influenza resulting in 181 deaths registered in Poland between May 2009 and May 2010 (Report GIS, 2010). The patients identified were aged between 0 and 85, the calculated incidence was 7.33 per

☆ This paper is part of a special issue entitled "Immunopathology of the Respiratory System", guest-edited by Professor Mietek Pokorski.

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http://dx.doi.org/10.1016/j.resp.2013.02.013

100,000 inhabitants and the 5–14 year old group had the highest cumulative population incidence rate. The greatest number of cases (561, 20.0% of the total number of 2798 cases) was reported in central Poland (Mazovia Region including Warsaw, the capital of Poland). The highest incidence of A(H1N1)pdm09 influenza occurred in November and December 2009 (Report GIS, 2010).

The new influenza pandemic requires epidemiologic description to assess the problem, identify risk factors and complications, to prepare plans for future seasons, and justify the use of prophylactic measures such as immunization. The aim of the present study was to describe the epidemiology of a new pandemic influenza in Polish people in the absence of a pandemic flu vaccination in central Poland in the 2009/2010 season. Our paper describes the events that took place during the pandemic period between May 2009 and January 2010 in the Mazovia Region in central Poland providing a background for the Polish epidemic situation.

2. Methods

The study was an epidemiologic surveillance study, approved by an institutional Review Board for Human Research. We retrospectively studied all 561 laboratory-confirmed cases of the A(H1N1)pdm09 pandemic influenza obligatorily reported to health authorities in the Mazovia Region in central Poland during the 2009/2010 pandemic season. Each case was traced and examined using a detailed questionnaire including personal data, date of first symptoms, clinical signs and symptoms, place of stay during the 7 days before first symptoms, putative exposure, general health condition, pre-existing chronic illnesses, medications and prophylaxis (influenza vaccination), date of consultation, course of the pandemic influenza and treatment.

A laboratory-confirmed case of novel influenza A(H1N1)pdm09 virus infection was defined as an illness in any person who had a respiratory specimen that tested positive for novel influenza A(H1N1)pdm09 by real-time reverse transcriptase PCR (rRT-PCR) (CDC Case definition, 2009). The samples were taken and tested for influenza A and B by a reverse-transcriptase polymerase chain reaction. Data on the population, number of influenza-like illnesses (ILI), hospitalizations and deaths were based on documents in the public domain (CSO, 2010; ECDC, 2010). An influenza-like illness was defined as an acute onset of fever (38 °C, symptoms appearing within 24 h) and cough, sore throat and/or chest pain. In the calculations, 95% confidence intervals (CI) were used.

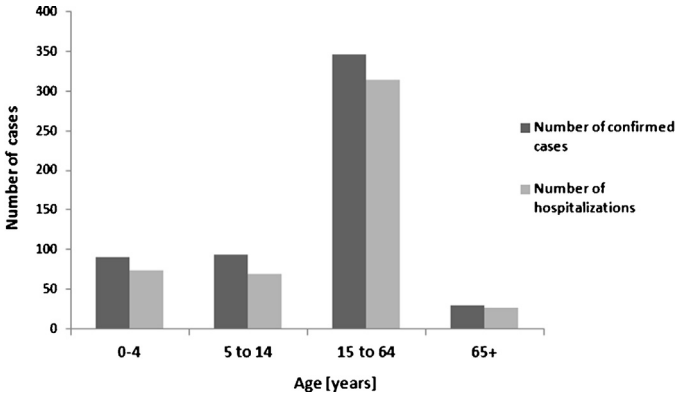

Fig. 1. Number of confirmed AH1N1v cases by the month.

3. Results

3.1. Epidemiology

In the Mazovia Region, the first, small wave of the pandemic influenza occurred in June 2009 (1611 ILI and 4 confirmed cases) and was followed by a second, more significant wave in October 2009 (6680 ILI and 20 confirmed cases). Influenza activity peaked in November 2009 (46,307 ILI and 306 confirmed cases) and then declined rapidly (Fig. 1 and Table 1). The first death was reported in November 2009.

There were 561 cases of laboratory-confirmed influenza type A(H1N1)pdm09 registered in the Mazovia Region between May 2009 and May 2010. The highest figures were observed in November 2009 (46,307 ILI and 306 confirmed cases) and December 2009 (30,863 ILI and 199 confirmed cases). The calculated incidence rate was 10.7 per 100,000 inhabitants. The greatest number of cases (346/561, 61.7% of total number of cases) occurred in people aged 15–64 (Fig. 2), but the 0–4 age group had the highest cumulative population incidence rate (32.7 per 100,000). The lowest cumulative population incidence rate was observed in older people (≥65 years, 4.0 per 100,000). The 5–14 age group had a cumulative incidence rate of 18.4 per 100,000 and the 15–64 age range was 9.4 per 100,000. Only 11/561 (2.0%) patients were immunized against seasonal influenza. Details are provided in Table 2.

3.2. Clinical course, complications, and mortality

The vast majority of confirmed cases occurred in hospitalized patients. Four hundred and eighty four people were hospitalized

Table 1
Influenza-like illnesses (ILI) with the number of hospitalizations in the Mazovia Region and Poland between May 2009 and May 2010.

Month	ILI patients hospitalized in Mazovia Region/all Poland	ILI in children aged 0–4 in Mazovia Region/all Poland	ILI in children aged 5–14 in Mazovia Region/all Poland	ILI in people aged 15–64 in Mazovia Region/all Poland	ILI in people >65 years old in Mazovia Region/all Poland	Total number of ILI in Mazovia Region/all Poland
May 2009	2/35	522/1650	489/2080	934/3569	312/721	2257/8038
June 2009	0/22	347/1047	350/1035	682/2302	232/485	1611/4669
July 2009	31/243	212/785	175/631	504/1713	226/405	1117/2534
August 2009	18/141	64/358	82/394	169/1157	45/165	360/2068
September 2009	2/34	566/2008	602/2299	1044/4469	280/810	2392/9586
October 2009	0/32	1096/5249	1392/6927	3128/16,144	1064/3632	6680/31,952
November 2009	425/3071	5441/30,993	14,958/62,986	21687/155,091	4221/18,020	46,307/297,090
December 2009	782/3512	3803/24,517	7814/64,898	16,783/127,736	2465/13,190	30,863/230,339
January 2010	83/495	2244/10,106	1963/12,216	5831/36,133	1677/5991	12,133/64,446
February 2010	22/249	1960/10,478	2472/12,401	5288/30,015	1119/4627	10,839/57,521
March 2010	1/174	2390/12,496	3119/15,258	4974/25,709	1174/4320	11,657/57,783
April 2010	4/143	1734/7472	1689/6876	2891/14,336	755/2946	7069/31,630
May 2010	12/109	1695/6138	1755/6323	2926/12,188	631/1784	7007/26,433
Total	1382/8260	22,074/113,297	36,860/194,324	66,841/430,562	14,201/57,096	140,292/824,089