ORIGINAL ARTICLE

Clinical and epidemiological description of the first cases of new influenza A (H1N1) attended in Spain

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Objective: To describe emergency consultations during the first day of the new influenza outbreak. The description covers the first cases of new influenza virus infection diagnosed, the epidemiologic context, and the organization of emergency services during the first 24 hours of care provided on that day.
Material and Methods: The medical records for emergency consultations on April 26, 2009 at an urban tertiary care hospital were reviewed to identify cases related to the new influenza virus. Clinical and epidemiologic data were extracted. When the new influenza was suspected, the attending physician ordered a complete laboratory and blood workup, chest x-ray, and nasal swab and throat swab to detect nucleic acids from new influenza virus A (H1N1). Blood was extracted for influenza viral specific antibodies testing. Information on the main organizational measures taken during the 24-hour period were also recorded.
Results: Ninety-nine patients were attended over the course of the day. Twelve (12%) had had some contact with cases of the new Mexican flu outbreak. The 12 cases all bore some relationship with 6 different trips (with between 3 and 25 days passing since the return flight). In 4 cases, it was considered that epidemiologic features were not consistent with a diagnosis of the new influenza. Those patients were therefore discharged without viral antigen testing. Four of the remaining 8 patients were admitted (all placed in private rooms that allowed for respiratory and contact isolation), and 4 were discharged. Three of the 8 patients were diagnosed with the new influenza. One case was the result of secondary transmission in the home, as the patient had not been to Mexico. The clinical picture was not different from ordinary influenza in humans. The patients' progress was excellent on treatment with oseltamivir for 5 days. There were no complications. A great deal of interaction and information exchange between emergency care providers took place during the first day of the epidemic, making it possible to respond effectively and in a timely manner.
Conclusions: The clinical characteristics of the new influenza A (H1N1) are similar to those of other outbreaks in humans. Emergency services, which are the first line of defense during outbreaks like the recent one, are capable of mobilizing the necessary resources to cope satisfactorily. [Emergencias 2009;21:166-171]

Key words: New influenza virus A (H1N1). Swine flu. Epidemiology. Emergency health services.

Introduction

Influenza A is a viral disease of swine caused by viruses belonging to the family Orthomyxoviridae. Swine flu can occasionally be transmitted to humans, mainly in people occupationally exposed to pigs. In these cases, the symptoms of the disease are very similar to those of epidemic human influenza[1-3].

At the beginning of April 2009, the first cases of an outbreak of swine flu in humans were described in Mexico, and the disease was renamed by the World Health Organization as new influenza A (H1N1), which is the term used now. Up to April

24th of this year, cases had been confirmed in Querétaro, Hidalgo, San Luis de Potosi and the Federal District of Mexico City, with more than 20 deaths declared in the country due to this disease[4,5]. All this resulted in the Mexican government closing schools and other public places as from that date, in an attempt to avoid the spread of the disease. That same day, the Catalan Ministry of Health issued a warning notice of this fact. Two days later, on Sunday April 26, 2009, a new team on duty started their work at 8 am in the Section of Emergency Medicine, Hospital Clinic of Barcelona. This paper describes the queries relating to the outbreak and the organization of emergency services during the first 24 hours of care provided on that day.

Method

The study site was the Section of Emergency Medicine, Hospital Clinic of Barcelona, located in the center of Barcelona, one of four public reference hospitals serving the city. The characteristics of the care section have been described in previous works[6-8].

The average number of Sunday consultations in this section is 73. The team on duty on Sunday April 26, 2009 consisted of three senior doctors and 6 medical residents to cover the area of primary attention triage level 1 and 2 (12 bays), triage level 3, 4 and 5 (5 bays) and the observation area (28 bays). In addition, there were 9 nurses, 5 auxiliary nurses, 2 health assistants and 1 radiology technician.

We collected clinical and epidemiological data of all medical records of patients whose reason for consulting was directly or indirectly related with the outbreak of new influenza A (H1N1) from Mexico. In addition, we recorded the main organizational measures adopted during the duty period.

When patients presented flu symptoms that had initiated during their stay in Mexico, or during the 10 days immediately following return, or after contact with a person whose symptoms met the above conditions, we routinely performed a blood test and chest X-ray, and, specifically, a nasal and pharyngeal swab test for the detection of viral nucleic acid and a blood sample for the determination of specific antibodies.

Results

On initiating the duty period, there were 33 patients in the areas of diagnosis, treatment and observation of the Section of Emergency Medicine. During the duty period, 99 patients were attended, of whom 12 (12%) bore a relation with the outbreak of new influenza in Mexico. All were of Spanish nationality. These 12 patients were from 6 different flights, with time elapsed since the return flight between 3 and 25 days. The characteristics of the emergency consultations are shown in Table 1. In four of the 12 cases, we found no compatible epidemiological context, so they were discharged without viral nucleic acid determination. Of the remaining eight, four were admitted to hospital (all in single rooms meeting the requirements for respiratory and contact isolation) and four were discharged. Subsequently, three of these proved positive for a new flu virus, non-typeable for seasonal virus hemagglutinin, and were diagnosed with new influenza A. Detailed clinical and evolutionary features are presented in Table 2. Importantly, one case was a secondary transmission at home; this person had been in close and prolonged contact with an imported confirmed case. All three cases evolved favorably.

Of the three patients, one was admitted and discharged within 48 hours with 5-day oseltamivir treatment and home confinement (single room, periodic ventilation of the room and the house, facial mask, individual items of personal hygiene) over the next 7 days. The other two patients, who were discharged from ED since they had presented excellent general state and very slight symptoms at the time of consultation, were contactewho had visited that country d for reassessment, beginning treatment with oseltamivir for 5 days and home confinement for 7 days.

With regard to organizational aspects, on arrival for ED duty on Sunday, the team found no written instructions or objective information concerning the outbreak of new influenza A. There was, however, a verbal communication by the Duty Chief about the warning issued by the Administration two days before. At 9 am, the doctor on duty at the department of Infectious Diseases contacted the ED team to warn that, given the magnitude of the new influenza A epidemic in Mexico, there was every possibility of massive consultation by patients with flu-like symptoms who had recently returned from that country. After this warning, actions and measures were initiated by the team on duty, and these are summarized in Table 3.

Discussion

This study describes the experience of an ED attending some of the first Spanish patients who

Table 1. Clinical and epidemiological characteristics of patients seen at the emergency department during Sunday, April 26 2009 in relation to the outbreak of new influenza A (H1N1) in Mexico. OC: outpatient consultation

	Age	Sex	Time of consultation	Place visited	Return to Spain	Initiation of symptoms	Main symptoms	Nucleic acid test	Treatment	Final destination
Case 1	24	F	10:58	Cancun, Mexico DF	4 days before	2 days before	Odynophagia, cough, expectoration, fever	Yes	Symptomatic, oseltamivir	Admission
Case 2	22	H	13:00	Cancun	6 days before	7 days before	Odynophagia, cough, expectoration, arthromialgia, fever	Yes	Symptomatic, oseltamivir	Admission
Case 3	22	H	14:57	Cancun, Mexico DF	3 days before	5 days before	Diarrhea, odynophagia, cough, cephalea, fever	Yes	Symptomatic, oseltamivir	Admission
Case 4	22	H	15:56	Cancun, Mexico DF	3 days before	5 days before	Diarrhea, odynophagia, cough, cephalea, dysthermia	Yes	Symptomatic, home confinement	Discharge & OC
Case 5	22	H	16:01	Cancun, Mexico DF	3 days before	2 days before	Cough	Yes	Symptomatic, home confinement	Discharge & OC
Case 6	46	F	17:59	Mexico DF	17 days before	16 days before	Diarrhea, abdominal pain, cough, dysthermia	No	Symptomatic	Discharge
Case 7	21	F	22:17	Cancun	25 days before	24 days before	Odynophagia, cough, asthenia	No	Symptomatic	Discharge
Case 8	21	H	22:24	No trip: Case 9 partner	–	2 days before	Cough	Yes	Symptomatic, home confinement	Discharge & OC
Case 9	22	F	22:25	Cancun	6 days before	6 days before	Diarrhea, hoarseness, odynophagia, cough, arthromialgia, cephalea, fever	Yes	Symptomatic, oseltamivir	Admission
Case 10	21	F	22:49	Cancun	6 days before	6 days before	cough, expectoration, cephalea, dysthermia	Yes	Symptomatic, home confinement	Discharge & OC
Case 11	23	F	0:12	Cancun	10 days before	–	Asimptomatic	No	None	Discharge
Case 12	22	F	0:16	Cancun	10 days before	–	Asimptomatic	No	None	Discharge

consulted for symptoms presenting during or immediately after a trip to Mexico at the height of an outbreak of new influenza A (H1N1) in that country. Here we highlight three important aspects: Firstly, we describe the clinical picture of those patients who were ultimately diagnosed with new influenza A (H1N1). Secondly, we discuss the main epidemiological data. Finally we present the organizational measures adopted during the duty period and some reflections on them.

Regarding clinical characteristics, the symptoms observed in these three patients did not differ from those usually present in seasonal epidemic influenza patients in Spain[9,10]. X-ray and blood tests were absolutely normal. The clinical status of patients was not significantly affected. It should be said that all three cases involved young patients without comorbidity, where influenza does not usually have any major impact. Indeed, two were discharged (cases 5 and 8) because they presented excellent clinical condition with only slight symptoms at the time of ED consultation. Both were prescribed symptomatic treatment, home confinement and subsequent monitoring by an outpatient facility expressly created for this purpose. It was not after such consultation, once confirmed positive for influenza A and negative for the seasonal influenza virus, that patients initiated antiviral treatment under home confinement.

It should be noted that all decisions, especially with regard to admission and initiation of antiviral treatment or not, were made jointly with physicians from the department of Infectious Diseases and Preventive Medicine and Epidemiology based on the clinical and epidemiological data available at the time. During the following days, the Health Authorities issued more specific guidelines on action and treatment, allowing a more homogeneous approach adapted to new briefs, depending on the level of alert activated[11,12].

The fact that two of the patients diagnosed with new influenza A (H1N1) had been in Mexico Federal District, with the greatest incidence of cases, a priori indicated increased epidemiological risk than others returning from the area of Cancun, at a time when the first cases were being diagnosed. However, it is particularly remarkable that the third person diagnosed (case 8) during the first day had not traveled to Mexico. His epidemiological background was limited to contact with his partner and friends who had traveled to Mexico. Of these contacts, only one was diagnosed with new influenza A (H1N1) and, curiously,

Table 2. Detailed clinical characteristics and evolution of the three cases diagnosed with new influenza A (H1N1)

	Case 3	Case 5	Case 8
Age	21	22	21
Sex	Male	Male	Male
Medical history	Smoker	Smoker	None
Previous treatment	Paracetamol	None	None
General symptoms	Fever 39.5ºC, headache 4 days	No	No
Respiratory symptoms	Odynophagia, Dry cough 48 hours	Dry cough 48 hours	Dry cough 48 hours
Digestive symptoms	Diarrhea 5 days before (liquid), self-limited at 24 hours	No	No
Physical examination	Normal	Normal	Normal
Chest X-ray	Normal	Normal	Normal
Blood test	Haematocrit 0.44 l/l Leucocytes 3560/µL (43%N,38%L,1%E,1%B,16%M) Platelets 285000/µL	Haematocrit 0.48 l/l Leucocytes 6200/µL (75%N,9%L,6%E,10%M) Platelets 159000/µL	Haematocrit 0.45 l/l Leucocytes 5200/µL (55%N,30%L,1%B,1%E,13%M) Platelets 232000/µL
Biochemistry	Normal. PCR 0,3 mg/dl	Normal. PCR 0,6 mg/dl	Normal. PCR 2,3 mg/dl
Complications	None Asymptomatic at 2 days	None Asymptomatic at 2 days	None Asymptomatic at 2 days
Destination from ED	Admission	Discharge	Discharge
Treatment	Oseltamivir 75 mg/12h during 2 days of hospitalization, then continued at home	Home confinement. Initiated Oseltamivir 75 mg/12h after 2 days on receiving positive diagnosis. Continued at home.	Home confinement. Initiated Oseltamivir 75 mg/12h after 2 days on receiving positive diagnosis. Continued at home

was not his partner. This does not absolutely preclude that the transmission was through her, since it is possible that this patient presented low viral load in the nasopharynx because of the number of days of evolution. This must introduce the possibility that some of the patients with flu symptoms, apart from those finally diagnosed with new influenza A (H1N1), could also have suffered from the disease, although at the time of ED evaluation their nucleic acid tests were negative. During the coming months, the clinical and virological evolution of new influenza A (H1N1) will probably be more accurately defined.

The actions performed throughout the duty period exemplify the central and critical role that hospital emergency services play, as the first medical services to confront epidemic outbreaks and provide health care and advice to the population in times of uncertainty. In addition, the ED showed a versatility and ability for action and interaction with other services that is difficult to find elsewhere in the health care network.

This explains why the final outcome of these 24 hours of work was so satisfactory, despite the absence of specific guidelines on action regarding this particular disease outbreak at the time of starting the duty period. This paper is not intended to produce a critical analysis of each one of the proceedings and their outcome. However, analyzed as a whole, the participants consider that most of the decisions and proceedings of that day were appropriate. From an ED perspective, the support received from other services was both appropriate and timely, so the feeling was one of being in control of the situation at all times. These patients were attended in the same area of care as other emergency patients and, moreover, ED attendance was relatively high that day (99 consultations versus the usual 73 on Sundays). The relatively small number of suspected new influenza cases (12 consultations during the duty period) may also have contributed to this sensation of security and control.

Based on the vast amount of information gleaned that day, together with the results of the expert meetings at all levels during the days after the start of the outbreak, more precise action protocols were subsequently established. However, we believe that this study reflects how, in the initial hours, an ED duty team was able to cope with a situation like that described. Although some aspects outlined here can be improved, they serve as starting points to deal with other similar situations, where the degree of initial uncertainty should not preclude the provision of quality care.

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Table 3. Key interactions and measures taken during the 24-hour ED duty period on Sunday April 26, 2009

Action	Time	Result
– Information search: website of the WHO and CDC	9:10	– Printout of clinical picture description and suspected case definition.
– Search for emergency action protocols	9:15	– Recovery of action protocols for avian influenza and acute respiratory distress syndrome. – Provision of FFP2 masks.
– Communication with the Department of Preventive Medicine	9:30	– Preventive Medicine takes responsibility for all contacts and information with the Administration. – Information on three similar cases admitted in Spain (Albacete, Bilbao and Valencia).
– Communication with the ED Management	9:40	– Assessment of the preference attention sites in ED (laminar flow bays).
– Communication with the Hospital Duty Chief	9:45	– First assessment of the availability of resources for hospitalization.
– Communicating with the duty physician, microbiology dept.	11:00	– Description of procedure for collecting samples for nucleic acid determination. – Provision of special swabs.
– Communication with the Department of Preventive Medicine	12:00	– Confirmation of the need for consistency and for admission of the first suspected ED case. – Notification of epidemiological data for Public Health Service. – Information on two similar cases in Catalonia (Girona and Campdevànol).
– Communicating with Hospital Pharmacy	13:15	– Identification of stocks of oseltamivir in the hospital (12 tablets in total) and indication on obtaining more from other hospital pharmacies.
– Communication with the Department of Preventive Medicine	17:00	– Instructions from the Administration. – Centralization of information through Preventive Medicine. – Confirmation that the suspected case from Girona traveled to Mexico with (our) cases 3, 4 and 5 in ED.
– Communication with the Head of Hospital Duty	17:40	– Preparation of an additional room to accommodate admission needs of patients in ED and possible subsequent demand.
– Visit from Head of the hospital (CEO)	18:30	– Exchange of information. – Support for actions undertaken.
– Joint visit with the Head of Service and the Infectious Diseases duty physician of suspected cases Service of Infectious Diseases.	19:10	– Decision on admission or discharge of patients. – Establishment of the conditions of isolation in the hospital (laminar flow rooms and other private rooms). – Treatment for hospitalized cases established. – Establishment of home confinement conditions and subsequent control with outpatient visits.
– Communication Department of Communication and External Relations	19:30	– Information on the first press conferences.
– Communication with ED Management	20:00	– Decision to augment ED staff with two extra ED physicians from 21:00 until 8:00 the next day to handle a possible overload after the first news press conferences are broadcast on TV and radio.
– Communication with the Head of Hospital Duty	20:45	– Evacuation of conventional patients previously hospitalized in Infectious Disease ward to the room previously prepared in order to free isolation beds, in Infectious Diseases, for admission of suspected cases referred from ED.
– Communication with the deputy head of Hospital Duty at Granollers Hospital	23:00	– Report of a case of reasonable suspicion (from the same Mexico trip as case 1). – Communication with the Head of Hospital duty.
– Communication with the Department of Preventive Medicine	24:00	– Information on the overall situation at that time, no patients in ED, 4 patients admitted and treated, 4 patients discharged with treatment and outpatient appointment.
– Communication with the ED Management	8:00	– Overview of the situation and change of duty team.

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Descripción clínica y epidemiológica de los primeros casos de la gripe nueva A (H1N1) atendidos en España

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Objetivo: Describir las consultas atendidas en urgencias durante el primer día de brote de gripe nueva A (H1N1), descripción de los primeros casos diagnosticados, su contexto epidemiológico y la organización que se estableció en urgencias durante las 24 horas de la guardia de dicho día.
Método: Se revisan las historias clínicas de las consultas recibidas en urgencias el día 26 de abril de 2009 en relación al brote de gripe nueva A (H1N1), y a partir de ella se recogen datos clínicos y epidemiológicos. En los casos sospechosos se realizó una analítica general, una radiología de tórax, un frotis nasal y faríngeo para la detección de ácidos nucleicos del nuevo virus de la la gripe A (H1N1) y una extracción de sangre para la determinación de anticuerpos específicos. Además, se han recogido también las principales medidas organizativas que se tomaron durante la guardia.
Resultados: Durante la guardia se atendieron un total de 99 pacientes, de los cuales 12 (12%) estuvieron relacionados con el brote de nueva gripe en México. Estos 12 pacientes procedían de 6 viajes diferentes, con un tiempo transcurrido desde el vuelo de retorno de entre 3 y 25 días. De los 12 casos, en cuatro de ellos se consideró que no había contexto epidemiológico compatible, por lo que fueron dados de alta sin realizárseles determinación de ácidos nucleicos. De los ocho restantes, cuatro se ingresaron en el hospital (todos ellos en habitaciones individuales que reúnen los requisitos para el aislamiento respiratorio y de contacto) y cuatro fueron dados de alta. De estos 8 pacientes, tres fueron diagnosticados de gripe nueva A (H1N1), uno de ellos por transmisión secundaria doméstica sin haber estado previamente en México. Las características clínicas del cuadro no difieren de la gripe epidémica humana que habitualmente padece la población. Su estado clínico era excelente, siguieron tratamiento con oseltamivir durante 5 días y no hubo complicaciones. Durante la guardia se pusieron en marcha múltiples interacciones que dieron como resultado una respuesta adecuada en tiempo y manera.
Conclusión: La gripe nueva A (H1N1) presenta unas características clínicas similares a la gripe humana epidémica. Los servicios de urgencias constituyen la primera línea de choque para hacer frente a brotes epidémicos como éste, y son capaces de movilizar los recursos necesarios de forma satisfactoria. [Emergencias 2009;21:166-171]

Palabras clave: Nueva gripe. Gripe porcina. Epidemiología. Servicio de urgencias.