VIEWPOINT

Epidemic of new influenza A (H1N1): the view from an emergency department in Mexico City

OMAR SALDAÑA DÍAZ[1], CÉSAR A. CARREÓN MÉNDEZ[2], EDGARD DÍAZ SOTO[3]

[1]Servicio de Urgencias en Centro de Atención Primaria Médica Sur. Servicio de Urgencias del Hospital General de Zona (HGZ) 1A Venados del IMSS. México. [2]Servicio de Urgencias del Centro de Atención Primaria Médica Sur. México. [3]Administración de Servicio de Salud. Centro de Simulación y Destrezas Médicas de la Fundación Clínica Médica Sur. Servicio de Urgencias del HGZ 8 del IMSS, México.

In recent decades, influenza has received much attention in the medical world because of its high pandemic potential[1,2]. The World Health Organization (WHO) estimates that 5-15% of the world's population is annually infected by influenza virus type A; of these, between 3 and 5 million people develop serious clinical pictures leading to the death of 250,000 - 500,000 people each year[2]. It has been observed that the only way to prevent the spread of influenza is through vaccination of the general population, mainly of people most at risk. To date, four main types of influenza virus A have been identified in swine, the subtypes H1N1, H1N2, H3N2 and H3N1. The most prevalent of these is H1N1, which was first isolated in 1930[3]. The periods of greatest infection in swine are late autumn and early winter, the same period when most cases of human infection are recorded. Influenza is thus considered a seasonal disease which habitually affects people working on pig farms, cattle fairs and others in contact with the secretions from the nose or snout of infected pigs[3].

Epidemiological aspects

In the past, the Center for Disease Control (CDC) of the United States annually received an occasional report of human swine flu infection by virus A H1N1. However, from December 2005 to February 2009, 12 such cases were confirmed[3,4].

In Europe, between 2007 and 2008, seasonal influenza was marked by the appearance of many cases of infection by influenza virus A H1N1 and which proved resistant to treatment with oseltamivir[5].

From mid-March 2009 the appearance of clinical cases with certain similarities were unofficially reported in Mexico, unfortunately resulting in the death of young people who, within hours of symptom onset, presented acute respiratory distress syndrome (ARDS)[6]. However, it was not until Thursday April 23 that the Secretary of Federal Health decreed the suspension of classes at all schools in Mexico city and the Metropolitan area. On the following morning, the Secretary of Health of Mexico City ordered the closure of cinemas, theatres, bars, restaurants, clubs, nightclubs and sports stadiums, which produced a general wave of fear in the population.

The morning of April 24, on my way to work at the hospital, I was surprised to find the streets empty, without the normal long queues of people waiting for buses. The entrance to the metro was empty; no people running along platforms to enter the compartments which usually carry 100 to 150 people, all together, face to face. At most, there were 10 people per compartment, well separated and all wearing protective facial masks. On arrival at the hospital emergency department (ED), I encountered an endless queue of people awaiting consultation, way above normal. Our ED routinely attends 140 a day; however, between 24 and 28 April, there were up to 300 visits per day, representing an increase of 114%. Of these, 80% presented simple upper respiratory or nasal and throat symptoms, but also physical symptoms related with fear of becoming infected by swine flu,

CORRESPONDENCE: Omar Saldaña Díaz. Servicio de Urgencias en Centro de Atención Primaria Médica Sur. Servicio de Urgencias del Hospital General de Zona (HGZ) 1A Venados del IMSS. México.

RECEIVED: 11-5-2009. **ACCEPTED:** 14-5-2009.

CONFLICT OF INTEREST: None

such as tension headaches and/or anxiety attacks. (Monthly report on productivity, Emergency Department of the HGZ 1A).

On entering the emergency room, I detected a sense of fear among the medical and paramedical staff of being infected, since little information about the virus was available. As a result, the hospital authorities arranged meetings with all the staff by turns to provide complete information on the contingency plan to be implemented from then on.

1. Quick guidelines on the influenza A H1N1 virus were distributed, which included measures of prevention, diagnosis and treatment, as well as advice on hospital and outpatient management of suspected and confirmed cases, preventive management measures for the general population. The following measures were adopted:

2. Protective equipment was provided to all healthcare workers in direct contact with patients: caps, disposable gowns, masks (N95 as specified by WHO and CDC) and goggles.

3. Prophylactic oseltamivir (75 mg every 24 h during 10 days) was administered to all medical and paramedical personnel in the areas of planned and ED consultation[7].

4. Two separate areas for patients with respiratory disease were established in the emergency department:

a. TRIAGE AREA: initial consultation for all patients seeking medical attention for respiratory pathology. Using predefined specific questions, suspected cases of swine flu were either ruled out or confirmed (Table 1):

b. HOSPITALIZATION AREA: A specific area, isolated from ED, was conditioned for evaluation of suspected cases to be admitted and tested, including a rapid assay for the detection of the influenza A H1N1 antigen.

5. Once infection by human influenza A H1N1 virus was confirmed, the patient was evaluated for hospital treatment and complications, mainly coexisting bacterial infection (pneumonia). The most frequently observed agents were:

a. *Streptococcus pneumoniae* or *Haemophilus influenzae.*

Adult treatment begins with 2 g ceftriaxone every 24 hours and 50 mg/kg/day every 12 hours for 10 days for children.

b. *Staphylococcus aureus.* Adult treatment begins with 750 mg cefuroxime every 8 hours or 600 mg clindamycin every 6 hours for 7 to 10 days; for children, 75 to 150 mg cefuroxime every 8 hours or clindamycin at doses of 10-30 mg/kg/day in 4 doses for 7 to 10 days.

Table 1. Alarm symptoms in the triage area

Clinical picture	Alarm Data
*Fever 39°C	*Fever difficult to control
*Headache	*Breathing difficulties
*Pharyngeal pain	*Disordered state of consciousness
*Slight rhinorrhoea	*Impaired cardiac function
*Myalgia and arthralgia	*Worsening of chronic disease
*Stomach pain, nausea, vomiting and diarrhea (more common in children than in adults)	*Vomiting and /or persistent diarrhea
*Cough, predominantly dry	
*Conjunctivitis (rare)	
*Asthenia and adinamia	

References 2, 3, 8 and 9.

c. Methicillin-resistant *Staphylococcus aureus.* The treatment is 1g vancomycin every 12 hours for 7 to 10 days.

6. Finally, according to the degree of complications, three possible final destinations were planned:

a. Discharge home, with epidemiological and clinical follow-up.

b. Admission to hospital isolation ward.

c. Admission to hospital intensive care.

Fortunately, up to May 7, only 5 rapid-test confirmed cases were admitted to the hospital, with no deaths recorded.

However, national statistics for the period up to Thursday May 7, 2009, showed 1,204 confirmed cases and 42 deaths. Figures 1 and 2 and Table 2 show the statistical data by federal state and deaths by age groups.

Epidemiological treatment and management

Treatment with antiviral drugs indicated for human influenza A H1N1 is being administered to confirmed cases, highly suspect patients, healthcare workers or members of the general population at high risk of exposure, in accordance with the therapeutic schemes shown in Tables 3 and 4.

Table 2. Deaths by age group until May 5, 2009

Age group (years)	No. of deaths
0 to 9	2
10 to 19	2
20 to 29	16
30 to 39	9
40 to 49	5
50 to 59	4
60 to 69	4
70 or more	0
Total	**42**

Source: S.S.A. as at May 6.

State	Nº Cases	State	Nº Cases
– Aguascalientes	5	– Nayarit	6
– Baja California	18	– Nuevo Leon	9
– Chihuahua	4	– Oaxaca	29
– Chiapas	10	– Puebla	8
– Colima	10	– Queretaro	2
– Mexico City Federal District	673	– Quintana Roo	11
		– San Luis Potosi	105
– Durango	6	– Sonora	6
– Guerrero	10	– Tabasco	6
– Guanajuato	4	– Tamaulipas	1
– Hidalgo	55	– Tlaxcala	29
– Jalisco	15	– Veracruz	2
– State of Mexico	107	– Yucatan	17
– Michoacan	12	– Zacatecas	33
– Morelos	8	– Extra	3

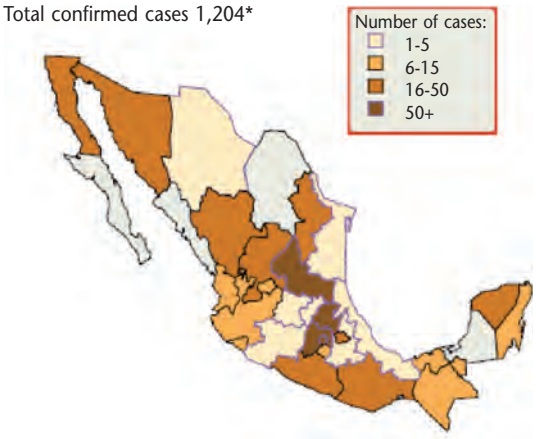

Figure 1. Cases of new influenza A (H1N1), by state. *Includes 8 cases with unknown date of symptom onset. Source. S.S.A. as at May 6.

Reflections

The natural human reaction to the unknown, apart from religious belief, is fear. This conditions responses mediated by temporarily altered emotional states, leading to attitudes which are uncommon in our daily lives.

When the news spread about the emergence of an epidemic of the swine flu virus, now called new influenza A (H1N1), the fear generated in many people motivated different reactions, ranging from disregard for the information about the danger of the virus to hysteria. The latter spurred a struggle for possession of drugs and tools for survival in the face of an imminent "apocalypse" and the end of the world.

The truth is that, at both the hospital and the civil government level, fairly drastic preventive measures were implemented, considered extreme by some, such as the suspension of classes at all educational institutions, the closure of restaurants, cinemas and theatres. As expected, with the change of government mandates and the level of alert warnings initially issued, more relaxed compliance with these measures was rapidly noted.

However, this was a test to demonstrate leadership of our services and coordination with other hospitals and departments.

The results and our efforts will be more objectively evaluated in the near future. As physicians, the experience acquired in these early stages is invaluable and hopefully reproducible by young physicians and trainees in the event of a similar circumstance in future.

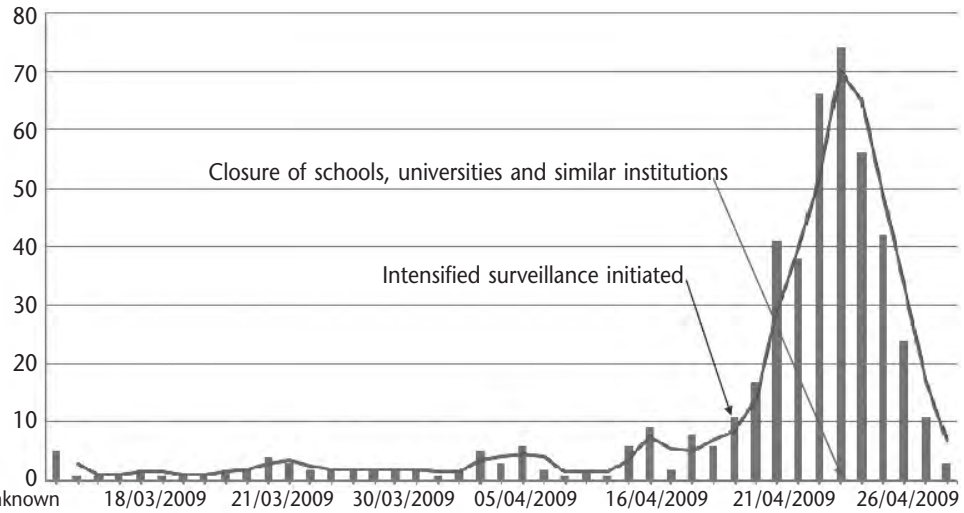

Figure 2. Confirmed cases of new influenza A (H1N1) 03 May 2009 and 05 May 2009. Source: S.S.A. as at May 6.

Table 3. Use of oseltamivir

Patient age	Chemoprophylaxis			Treatment		
	Dosis	Times per day	Duration	Dosis	Times per day	Duration
Adults	75 mg	once	10 days	75 mg	twice	5 days
Children*						
15 kg or less	30 mg	once	10 days	30 mg	twice	5 days
15 to 23 kg	45 mg	once	10 days	45 mg	twice	5 days
24 to 40 kg	60 mg	once	10 days	60 mg	twice	5 days
40 +	75 mg	once	10 days	75 mg	twice	5 days

*Outline of treatment recommended by the Centers for Disease Control (CDC) in children older than 12 months of age or weight greater than 15 kg, Chemoprophylactic antiviral treatment is not recommended for children under 3 months, but the risk-benefit ratio in patients between 3 and 11 months of age should be considered.

Table 4. Use of zanamivir

Patient age	Chemoprophylaxis			Treatment		
	Dosis*	Times per day	Duration	Dosis	Times per day	Duration
Adulto	10 mg	once	10 days	10 mg	twice	5 days
Niños (7 o más años)	10 mg	once	10 days	10 mg	twice	5 days

*Each inhalation is equivalent to 5 mg.

This article serves as recognition of the efforts made by my medical colleagues and those working in other Mexican states who helped to safeguard that most important asset of all human beings, health.

References

1 Jairo Gooskens MD. Marcel Jonges, MS. Eric C.J. PhD. Morbidity and Mortality Associated with Nosocomial Transmission of Oseltamivir-resistant Gripe A (H1N1) Virus. JAMA 2009;301:1042-6.
2 Fabrice Carrat, Elisabet Vergu, Neil M. Ferguson y cols. Times Lines of Infection and Disease in Human Gripe: A Review of Volunteer Challenge Studies. Am J Epidemiol 2008;167:775-85.
3 Coordinating Center for Infectious Diseases (CCID) Key Facts about Swine Gripe (Swine Flu). Available at: (http:// www.cdc.gov/flu/swine) updated April 21, 2009.
4 William W. Thompson, PhD. David K. Shay, MD, MPH. Eric Weintraub, MPH y cols. Gripe-Associated Hospitalizations in the United States. JAMA 2004;292:1333-40.
5 Helen C. Maltezou. Nosocomial gripe: new concepts and practice Current Opinion in Infectious Diseases 2008;21:337-43.
6 Medica Sur en Lìnea, Gripe A (H1N1) Disponible en: (http://www.medicasur.com.mx/wb/Medica_en_linea/informe_de_urgencias) consultado en mayo 2009.
7 Instituto Mexicano del Seguros Social (IMSS). Guía rápida de Prevención, Diagnostico y tratamiento del Virus de la Gripe A Porcina H1N1. Mayo 2, 2009.
8 Masahide Kaji Aya Watanabe and Hisamichi Aizawa y cols. Differences in clinical features between gripe A H1N1, A H3N2, and B in adult patients. Respirology 2003;8:231-3.
9 Interim Guidance on Infection Control and Antiviral Recommendations for Patients with Confirmed or Suspected Swine Gripe A Virus Infection. Available at: (http://www.cdc.gov/flu/swine/recommendations.htm) updated April 21, 2009.