Experience from the 2009 Influenza Outbreak in Mexico: One Year Later

Author

Gilberto Felipe Vazquez de Anda, *MD, PhD*

Head

Critical Care Robotics Department

Hospital Materno Perinatal "Mónica Pretelini"

Instituto de Salud del Estado de México, and Professor

Centro de Investigación en Ciencias Médicas de la

Universidad Autónoma del Estado de México, Mexico

gf_vazquez@yahoo.com.mx

Ángela Montenegro Cárdenas

Bacteriolgist

Fellowship in Molecular Biology at Centro de Investigacion en Ciencias

Médicas de la Universidad Autónoma del Estedo de Mexico

Federación Internacional de Químicos

Clínicos y Laboratorios de Medicina (IFCC)

Colegio Nacional de Bacteriología, CNB-Colombia

On April 23rd 2009, a news release informed the world about an influenza outbreak in Mexico due to a new virus (Swine origin AH1N1), with a high mortality rate among young people due to severe pneumonia. A few months later the influenza AH1N1 infection had spread rapidly from one country to another reaching the level of a pandemic, the first one in the 21st century.

Influenza AH1N1 in the ICU

Despite the small proportion of patients with pneumonia compared with the population infected and/or with mild symptoms (Perez Padilla 2009), there was suddenly an over-demand for admission of patients into hospitals and, specifically, into intensive care units (ICUs). It was evident that in Mexico this small proportion was already large enough to break down the ICU system. Official numbers of the 2009 outbreak show 72,481confirmed cases and 1,198 deaths directly related to influenza AH1N1. The age group most affected was 20 to 59 years (www.salud.gob.mx). This was unexpected according to the natural age distribution of those affected by influenza A, i.e. normally during childhood and older age. During 2009 in Mexico, we observed two important outbreaks: one at the beginning of spring and the second during late summer/beginning of fall. The second was more severe than the first one.

There is no doubt that the outbreak of influenza AH1N1 had a significant impact on our perception of biological threats in the ICU. Besides the terrible loss of human lives and the economic consequences of the pandemic, a learning process has made our Intensive Care System stronger. After the first wave of the pandemic from March to May 2009, there was intense activity to promote prevention as well as a specific action plan to deal with a potential second wave. There was national awareness about the risk of a new hit of influenza AH1N1 during the winter; therefore, authorities at every level of the health system implemented ways to promote sanitary measures such as hand washing, protection after sneezing, and vaccination campaigns. Besides these actions, information about the pandemic via the media/telecommunication systems enabled people to receive information almost in real-time. Thousands of brochures giving information about the outbreak were distributed. Interestingly, the influenza outbreak promoted strong multinational collaboration and high-impact journals worldwide invited authors to report their experience.

Life changed in Mexico, as did the way of treating communityacquired pneumonia at the ICU. The challenge was to control our procedures in

preparation for a biological crisis in the ICU through an effective action plan.

Improvement of Equipment

A large investment was made in equipment to protect healthcare workers. There was a national vaccination campaign for immunisation against influenza (either A or AH1N1), equipment and personal protection (e.g. glasses, N95 masks, globes, and gowns) (Fig. 1). Also, a large investment was made in mechanical ventilators to cover the expected demand, as well as acquisition of equipment for treatment of acute respiratory failure (ARDS), such as High Frequency Oscillatory Ventilators (HFOV) and Extracorporeal Membrane Oxygenators (ECMO).

A group of experts guided by the Federal Health Secretary (Secretaria de Salud) formed a task force to write "Guidelines for Influenza AH1N1" and "Guidelines for Influenza AH1N1 in Pregnant Women" (www.salud.gob.mx) to standardise the diagnosis, admission and treatment at the ICU of infected patients. The guidelines were widely distributed directly to public and private hospitals, as well as via the Internet.

According to epidemiological reports in Mexico (Perez Padilla et al. 2009; Dominguez Cherit et al. 2009), during the spring outbreak of influenza AH1N1, ARDS was highly aggressive and mortality in the ICU was around 40 percent, with high needs of airway pressures and FiO2. Problems arose to adequately ventilate patients with severe pneumonia, the conventional techniques and the ARDS network protocol rapidly failed to keep patients with adequate modes of lung protection. There were many "trials and errors" to improve gas exchange and many explored rescue therapies for ARDS, like prone position, lung recruitment maneuvers, nitric oxide, HFOV and (in some cases) the use of ECMO (Fig. 2). Most intensivists used steroids and others used a combination of steroids and recombinant human activated Protein C as medical treatment for ARDS (personal communication, Dr. Asisclo Villagómez, Hospital 1o. de Octubre del ISSSTE, Mexico City).

Educational Meetings

There were a number of educational meetings held nationwide for influenza AH1N1. Symposia, forums, expert meetings, videoconferences, mechanical ventilation workshops, ventilator triage, and other various platforms and topics were presented at the main Mexican associations, academies and congresses during this crucial initial period.

Communications about our experience helped other ICU teams worldwide to prepare their own action plan and to generate useful databases to better understand the pandemic. Then, we received feedback to help face our second hit in summer/fall. Research and publications during the first pandemic of the 21st century was a very interesting issue. The influenza virus spread rapidly throughout the world, and research on the AH1N1 virus was produced worldwide. There are more than 13,000 citations on Google and more than 6,000 in PubMed where basic, experimental, epidemiological, and clinical research are reported. Mexican authors reported three main epidemiological studies (Perez Padilla et al. 2009, Dominguez Cherit et al. 2009; Echavarria et al. 2009) two of them related to critically ill patients.

As expected, the magnitude of the second hit of the outbreak of influenza AH1N1 was harder than the spring outbreak. The ICUs were occupied with infected patients and specific areas of hospitals were isolated to receive patients with moderate symptoms. A novel strategy to cover more hospitals with specialised physicians was launched. The programme of Telepresence, using robots directed by remote control via wireless internet, was used for the first time in a biological crisis. This novel programme assisted three suburban hospitals in the State of Mexico, acute care facilities including emergency room, ICUs, and isolated areas for influenza. The programme showed that is feasible to provide assistance from highly specialised physicians to distant communities during an outbreak of influenza (Vazquez de Anda 2010).

Conclusion

One year after the experience of our first biological epidemic, we feel that Mexico is closing the cycle. The swine flu pandemic was less aggressive than expected; the number of persons that died is relatively low compared with the much higher number of infected people. Perhaps such unexpected low mortality was due to a good response to the challenge of a pandemic. The use of telecommunications, news, research, knowledge of epidemics, biotechnology and better equipment in ICUs, antibiotics, antiviral, vaccines, mechanical ventilators, and the importance of being prepared for disaster, might have been the strongest contributors to such a low mortality rate. Perhaps, we are changing/improving our fate.

Published on : Thu, 15 Aug 2013