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## **Editorial:**

# **CONSIDERATIONS ABOUT INFLUENZA: VIRUSES AND VACCINES**

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**Version en español**

Hippocrates (-V and -IV centuries) firstly described influenza symptoms<sup>1</sup>. The Orthomyxoviridae, family of the influenza virus, were initially described in pigs during 1931 by Richard Schope. To this family belongs the A, B and C types. A and C types are found in humans and animals while B type is exclusively found in humans

Notwithstanding, only in the mid-nineteenth century was registered in detail despite numerous and confusing former epidemics and more than thirty pandemics occurred since the sixteenth century onwards<sup>2</sup>.

The more evoked and mortal pandemics came up between 1918 and 1919. At present, it is estimated that this catastrophic process caused 50 to 100 millions of deaths all over the world. It was polemically known as Spanish flu because of a plausible decision made by Spaniards related with the socialization of a great number of associated data whilst other countries, in war or postwar, minimized

them<sup>2</sup>.

This pandemics whose causes of death were bacterial pneumonia, as complication of the viral state as well as the bleedings resulting from the own viral infection, had an uncertain geographic origin and focused its lethal action particularly in young adults. In this regard, it differed from usual flu which deadly attacks to children and old people<sup>2</sup>.

In relation with its etiology, *Haemophilus influenzae* was suspected to be its causative agent until the 30' decade of the twentieth century in congruence with the bacterial view of the epoch. Nevertheless, a few years later (1933) the research group directed by Patrick Laidlaw joined to the Medical Research Council achieved the isolation of the virus in humans. Subsequently, Jonas Salk (who several years later used this experience in his anti-polio vaccine) and Thomas Francis developed in 1938 the first vaccine against the influenza virus. This vaccine, having impurities producing side effects, was administered to the US soldiers during the II World War<sup>3</sup>.

The aforesaid side effects, some of them identical to those generated by influenza, lead then to improper confusions. Something similar occurred in 1979, when the vaccine was administered to 25% of US inhabitants intending to prevent a possible swine influenza epidemic. An association with the risk of suffering neurological Guillain - Barre syndrome, later undemonstrated, was argued, the vaccination campaign ceased and the epidemics did not occur<sup>2,4-5</sup>.

The increasing purification of vaccines allowed the development of improved products apt to be annually administered to high risk populations. In this regard, in the European autumn of 2009 a tested and approved vaccine against the A type H1N1 subtype was available. This strain was responsible of the lethal pandemics of 1918<sup>4,5</sup>.

Nowadays, it is known that Russian flu (1889-1890) was possibly caused by the A type H2N2 subtype; the Spanish flu (1918-1919) by the abovementioned type and subtype; the Asian flu (1957-1958) by the A type H2N2 subtype; the Hong-Kong flu (1968-1969) by the A type H3N2 subtype and the recent one (2009-2010) by the A type H1N1 subtype<sup>6</sup>.

During 2013, two relevant facts occurred in this regard<sup>7</sup>:

- The FDA approved the trivalent vaccine (Flublok), free from live viruses, mercury and egg
- The so called quadrivalent vaccine with four antigens was employed

Finally, it is adequate to outline that a new vaccine category with a numeric suffix indicating the number of antigens has been currently established:

- 1. IIV (Inactivated Influenza Vaccine) with two subclasses: IIV3 e IIV4, representing egg-based and cell culture-based trivalent inactivated influenza

- vaccines and egg-based quadrivalent inactivated influenza vaccines, respectively.
- 2. RIV refers to recombinant hemagglutinin influenza vaccine, available as a trivalent formulation (RIV3).
  - 3. LAIV refers to live-attenuated influenza vaccine, available as a quadrivalent formulation (LAIV4).
  - 4. The prefix "cc" refers specifically to cell culture-based vaccine

From this fenced review it results that influenza viruses have gone through human history, and why not, could also have contributed to change it in several aspects.

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