International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 04 Issue 08 August 2021
DOI: 10.47191/ijcsrr/V4-i8-20, Impact Factor: 5.825
IJCSRR @ 2021
www.ijcsrr.org

Predicting the Third Wave over the Footsteps of Spanish FLU

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ABSTRACT: It's been more than a year since COVID-19 is creating havoc all over the world. We have been through two waves since its outbreak in 2019. If we go some 100 years back, we find something that was more or less equally intense in the past called as the 'Spanish flu' also known as the '1918-19 influenza pandemic', that infected around 500 million people of which 50 million lost their lives. On a closer look at both the pandemics, there are lot of similarities with regards to its outbreak, spread and mortality rates. This creates suspicion that just like the third wave of Spanish flu, there might be the third wave of COVID-19 too.

KEYWORDS: COVID-19, Third wave, Influenza virus, Pandemic, Spanish flu

1. INTRODUCTION

The "Spanish" influenza pandemic of year 1918–1919, which led to ≈50 million deaths worldwide, remains a doomy warning to the public health. The questions about its pathogenicity and origin still remain unanswered keeping the general health of people in doubt. Although new information related to genome sequencing is coming out from autopsy, but still the viral genome is critical to understand. Also because of H5N1 avian epizootics, the concern has been raised that a new pandemic as deadly as the Spanish flu might develop that needs a lot of planning to counteract.[1,2]

This centennial anniversary of the 1918 pandemic and the 10-year jubilee of the 2009 H1N1 pandemic are milepost that provide a chance to reflect on the radical work which led to the discovery, sequencing and remodeling of the 1918 flu virus. This has helped us globally in preparing for the future threats. Uniqueness of the virus raised questions like "why was the 1918 virus so deadly", its origin and the ways to defend it led a group of researchers to sequence its genome so that we could predict the future pandemics.[3] Researchers employed reverse genetics to create an influenza virus bearing all eight gene parts of the flu virus to study the characteristics associated with its exceptional virulence. This exhibited a high-growth phenotype in human bronchial epithelial cells. In addition, the synchronized expression of the 1918 virus genes explains the unique high-virulence phenotype observed with this pandemic virus.[4]

Vaccination has a huge impact on these pandemics by lowering the attack rates significantly from 5 to 50 % in vaccinated to 5-28% in unvaccinated communities. These studies help document the fact that this approach to pandemic is helpful in controlling. Even if the herds are not vaccinated in first wave, the immunization will help reducing the fatality in the subsequent waves.[5]
Based on the disastrous effects of flu virus pandemic on health and economics of a country; several predictions are made from the influenza 1918. The data present in these publications were based on the mortality stats for each state and cities as well as the effect on different races, their pay scale, and area of residence. These formulations and figures can be used to predict and plan the economic effects of these disasters in future.[6]

2. THE SPANISH FLU: ORIGIN, SPREAD, WAVES, AND CONTROL.

Influenza viruses belong to the genus *Orthomyxoviridae* which are RNA with negative strands. They continuously circulate in humans all around the year mainly in the winter and the viruses which are antigenically new; emerge intermittently as pandemic viruses.[7]
1918-1919 pandemic was the most distressing epidemic in modern history. On 22nd May 1918 it reached Spain via France as an outcome of heavy traffic of Portuguese migrant workers to and fro from France. Official estimated data to be dead in 1918 is 147114, 21235 in 1919, and 17825 in 1920. However, evidences states that the 1918 A(H1N1) influenza virus improbably originated in a blowout from Spain, thus the 1918-1919 pandemic will always be acknowledged as the Spanish flu.[8]

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Several factors including World War I have added to the spread of severe influenza virus. Understanding of the old pandemics will help in handling the current situation in a better way and the future too. The historical timeline of events is the proof of its emergence and waves which led to 675000 lives in US alone, **March 1918 (Spring)**, marked the outbreak of flu like illness which were first detected in US, the periodic flu activity spreads through the US, Europe and Asia in next six months. **September 1918 (Fall)**, outburst of second wave at Camp Devens. This wave reaches its peak between September and November which proved out to be the most fatal, causing highest number of deaths. The health board mandates all flu to be reported and quarantined at home. **January 1919 (Winter)**, finally the third wave was there in the winter and spring season of 1919 which decreases in summer.[9,10]

The number of deaths during 1918 pandemic was more than that of the military and civilian deaths due to WWI. It estimates to about 50 million deaths worldwide which is also seen as 1/3 of the world's total population infected with the 1918 flu virus.[11]

Initially the pandemic spread drastically due to lack of health measures to counteract that were reliable only on non-pharmaceutical intrusions. But over the last 100 years, medical improvements including critical care, vaccines, antiviral drugs better diagnostic and communication in the communities worldwide have helped each other to overcome this effectively. There is notable advancement in technologies since the 1918 H1N1 pandemic; however prominent gaps still remain to be filled.[12,13]

3. COVID-19 IN COMPARISON WITH SPANISH FLU

An unexpected union between modern bio-technology and past records advocates that the influenza A(H1N1) viruses are a long-established family from China, not from Spain.[14]

1918 influenza pandemic and COVID-19 have more or less similar impact on the global economy, creating havoc in international relations with substantial delay in the diagnostics and treatment. Although both being drastic in nature; the death count varies largely including the physiology of deaths. The 1918 influenza had its vulnerabilities in the age group 25 to 40 years, affecting less than half the countries due to secondary bacterial pneumonia being the reason of deaths; whereas COVID-19 making the age group of 65 and above as an active vulnerable group in almost all the countries worldwide; where victims mostly died due to an overactive immune response resulting in organ failure.[15]

Some other studies stated that just like COVID-19, influenza pandemic also had its effects in citizens of age group <5 years, 20-40 yrs. and 65 and above, but the 20-40 age group had shown high mortality rates which is considered as an exclusive feature of this pandemic.[16]

Although there was a gap of 100 years between both the pandemics; in between some other pandemics arose like 1957 or the 1968 which were riskier for the elderly, just like the COVID-19. The comparison of temporal trends of COVID-19 and Spanish flu were concluded with the fact that the wave of COVID-19 had matched with the main wave of the 1918-19 influenza pandemic unexpectedly well for over two months.[17,18]

4. CONCLUSION

The article concludes with the fact that just like other similarities between Spanish flu and COVID-19, there must be the third wave waiting for us to be more careless and inert in paying attention to small indications from our own body and surroundings. The need of the hour is to increase the rate of vaccinations and imbibe good hygiene into our lifestyle that can subside the incoming threat in the form of third wave of COVID-19.

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