

An Observational Study on Comparing the Pandemicity of Spanish Flu (1918-1920) With Novel Covid-19 (2020)

Swarnapriya.S, Arul Mozhi.C – Pharm D Iv, Krishnankovil. Madhusudhan.S, Haroled Peter.P.L, Kumarasan.P

Arulmigu Kalasalingam College Of Pharmacy,

Department of Pharmacy, Annamalai University , Tamil Nadu.

Research Scholar Department Of Pharmacy, Annamalai University , Tamil Nadu. THIRUPATHI

Department Of Pharmacology, Arulmigu Kalasalingam College Of Pharmacy, Krishnankovil , Tamil Nadu.

Date of Submission: 20-11-2020

Date of Acceptance: 06-12-2020

ABSTRACT: Pandemic refers to an outbreak of a disease occurring over a wide geographic area and affects a huge population. Here we have carried out a comparative study on the proportion and rate of the current outbreak of Novel COVID-19 of the present time with Spanish flu during the year 1918 to 1920. In December 2019, the first case of Novel COVID-19 was reported in Wuhan, China. An initially regional epidemic has since rapidly expanded to a global pandemic with significant morbidity and mortality. On March 4th of 1918, a case with a sore throat, fever, and headache was reported to the hospital at Fort Riley, Kansas. This was believed to be the first case in the historic influenza pandemic during the year 1918, and it was later known as Spanish flu. This virus is highly communicable. Novel COVID-19 has also fatal symptoms like severe Acute Respiratory Distress syndrome, whereas, in Spanish flu, one has acute respiratory distress of varying severity. During that period, endemic Spanish flu had a mortality of five crore people. Here we have collected the prevalence and mortality of NOVEL COVID-19 till June 30 2020 and are compared with the 1918 Spanish flu pandemic. Both viruses caused high mortality in Europe and America. The second wave of pandemic Spanish flu took place during autumn in the year 1918, which was more deadly. Similarly, the second wave of novel COVID-19 is also speculated the same by the researchers.

KEYWORDS: Spanish flu, Novel COVID-19, Prevalence, Transmission, Mortality.

I. METHODOLOGY:

Here we made an observational on comparing COVID 19 (2020) with Spanish flu(1918-1920) pandemic we have collected the prevalence and mortality of novel COVID19 June

30 2020 and the mortality rate compared with the Spanish flu pandemic.

II. INTRODUCTION:

The novel COVID-19 is a new corona virus considered as one of the greatest threats to the human community, which had made people pause for a moment whoever they are and look back at their risk of life. Novel COVID-19 is a virus that produces severe acute respiratory distress syndrome. It is a zoonotic transmission associated with wild animals. Novel COVID-19 is rapidly transmitted from person to person. Etiology of COVID-19, Covi is RNA viruses with the crown-like structure viable under an electron microscope. Covi are the subfamily of orthocoronavirinae of the coronaviride family. It can further be classified into four distinct types, 1. Alfa coronavirus, 2. Beta coronavirus, 3. Delta coronavirus, 4. Gamma coronavirus.¹

Spanish flu is a pandemic of 1918 considered the deadliest in history. It affected 500 million people in the world. It was first observed in Europe, the United States, and part of Asia and spread worldwide². The strain of influenza known as Spanish flu spread rapidly in young, old, sick, and healthy people. Ten per cent of infected people die. It did not originate in Spain, but during World War I, Spain had free media that covered the outbreak and hence termed Spanish flu³.

The first COVID-19 disease was linked to direct exposure to a wholesale market of Wuhan; animal to human transmission was considered as the main mechanism. Subsequent cases were not associated with this mechanism. It was concluded that the virus could be transmitted from human to human and symptomatic people are considered as the source of virus spread. Even there is a possibility of transmission before symptoms and hence asymptomatic could also transmit the virus. Isolation is the best way to prevent the spread. Pre-and asymptomatic contribute to 80 per cent of COVID-19 transmission. The spread is primarily limited to close contact (6 feet, 1.8 meters), family members, and health care providers. A study showed that SARS-COVID 19 virus can be found on plastic for 2-3 days, stainless steel

for 2-3 days, cardboard for 1 day, copper for 4 hours. Viruses can also be found on the floor, computer mouse, trash can, and sickbed as well as in air up to 4 meters from the patient⁴.

The speed of transmission differs between the two viruses. Spanish flu has a shorter incubation period and shorter serial interval than the COVID-19 virus. The serial interval for the Spanish flu virus is 3 days while for the COVID-19 virus it is estimated at 5-6 days. This reveals that Spanish flu can spread faster than COVID-19. The number of secondary infections generated from one infected person is believed to be between 2 and 2.5 for the COVID-19 virus which is higher than for Spanish flu. Children are the important drivers for Spanish flu virus transmission in the community. In contrast, children are less affected than adults by the COVID-19 virus in the initial study. Symptoms of both viruses are similar but the percentage of people with severe disease differs. The current study of COVID-19 suggests that 80 per cent of symptoms are mild or asymptomatic, 15 percent are severe requiring oxygen and 5 percent are critical requiring ventilation. The percentage of critical and severe cases is higher in COVID-19 than influenza. Children, pregnant women, elderly, and those with underlying medical conditions are at risk for Spanish flu. The current study indicates age and underlying conditions increase the risk of infection of COVID-19⁵.

The symptoms of Spanish flu are more or less similar to COVID-19 and both commonly lead to a respiratory disorder⁵. In 1918 the first wave of Spanish flu occurred. Spanish flu had mild symptoms and it occurred in the spring season but had a low death rate. The infected people experienced symptoms such as fever, chills, fatigue, and the people usually recovered in a short period of time. The second wave of Spanish flu with revenge occurred in that same year but this time catastrophic death occurred. The symptoms include the skin turning blue and the lungs filled with fluid. It leads to suffocating after these conditions. The patient died within an hour or a day².

Spanish flu (Jan: 1918 – December:1920) occurred in three waves. First wave – (Spring 1918) was an outburst in a US military camp during World War I. In March at camp Funston in Fort Riley, Kansas more than 100 cases reported that US soldiers were across the Atlantic to prepare for war, so it became worldwide. Second wave (fall 1918) mostly affected health professionals like doctors and nurses resulting in a shortage of medical personnel around the US, so the death rate increased among 3 waves. The second wave was the most pandemic. Third wave (Winter 1918) that illness occurred during winter and spring of 1919 and subsided during the summer of 1919⁶.

The COVID-19 started their disastrous journey from Wuhan, China to all over the world. The scientist from Los Alamos National Laboratory identified that a mutation or any genetic

changes occur in the spike of the virus, and it is called D614G⁷. This dominant strain is more contagious than the normal virus which was found during that time and it started in early February in Europe, Australia, and North America⁸. This type of strain is not similar to the virus that caused early in China. In India 50% of strain is mutant⁹.

First recorded case: The 57-year-old Wei Guixian has been identified as the first victim of coronavirus (The Wall Street Journal). She was a shrimp seller in the Hunan Sea Food market in Wuhan city. On December 10th, 2019, she developed a cold and went to a local clinic for treatment and returned to her daily work. She continued to feel ill health. So she went to Wuhan Union hospital for eight days. She was barely unconscious and marked as the 1st corona patient. Many people who were working in that market also had the same symptoms. Wei or patient zero fully recovered in January 2020¹⁰.

The Spanish flu 1st recorded cases on March 4th, 1918. Cook Albert Gitchell in US army camp who suffered from sore throat and cold-like symptoms. The US army report to the hospital at Fort Riley, Kansas. On that same day, 100 fellow soldiers of him also suffered similarly¹¹.

HISTORY: SARS-CoV-2 was believed to be originated in the bat as like severe acute respiratory syndrome (SARS), Middle East respiratory syndrome. ICTV (International committee on taxonomy of virus) report that “severe respiratory syndrome coronavirus 2” will be a new virus in February 2020, named after COVID-19 (previously known as 2019 novel coronavirus) which was given by the WHO. In the year 1965, a human coronavirus was identified by scientists. After a few decades, they found similar viruses in several human and animal species and named them coronavirus due to their “crown-like appearance”. SARS was discovered in southern China in 2002 and spread to nearly 28 countries around the world. Over 8000 people were infected by July 2003 and almost 774 people have died. MERS originated in Saudi Arabia in 2012. Its contagious rate is less when compared with SARS, but it had a high death rate of almost 858 died¹². Spanish flu did not originate in Spain, but it bore this name because it played their feisty role at the time of World War I. At that time, Spanish media had covered the outbreak from the start. In 2014, a report from National Geographic stated that the Spanish flu emerged in China. James Higgins who lectures at Lehigh University in Bethlehem, In the year 1998, Pennsylvania researched the spread of the Spanish flu which originated in spring and is tied to a strain of H1N1 influenza This is still virulent today. “Mark Humphries” in Canada Memorial University found that respiratory illness and got stuck in China in 1917.

Approximately 96000 Chinese labor left France and the British; this caused the world pandemic Spanish flu. He also found the medical record among 25000 Chinese corps that 3000 people had flu symptoms at the end of medical quarantine. “Christopher Langford

said that China had a low mortality rate because their body had developed the immune system due to the exposure to the virus¹³.

Prevalence and mortality rate of COVID 19 in China

China is a country with highest population 1,439,323,776 people. In December 2019 the first case of novel COVID-19 was reported in Wuhan. Initially regional epidemic has since rapidly expanded to global pandemic with significant morbidity and mortality.

Table 1: Condition of novel COVID -19 in China¹⁴

Month	Confirmed cases	Death
January	11,200	213
February	68,100	2,622
March	2,900	474
April	1,700	1328
May	100	1
June	700	3

There were high confirmed cases and death during the month of February and gradually reduced in the month of March, April and May. Confirmed cases slightly increased in the month of June than that of May.

Table2: COVID 19 cases in china¹⁵

Total cases	84,700
Recovered	80,059
Death	4,641



Figure1: Monthly death % in china.

February contribute 56% of death due to COVID 19 and gradually reduced. In the month of June only 3 cases were reported as death due to novel COVID 19.

The mortality rate is calculated as death occurring during a given period of time by size of population affected during that time *10ⁿ. The mortality rate due to novel COVID-19 is calculated from December to 30th June as 4641/84700*100 = 5.48%

Prevalence and mortality rate of COVID-19 in Italy

1st case: It was identified at 30th January in 2 Chinese tourists have COVID-19 positive, who visited Italy at that time. In Italy northern region “Lombardy” is mostly affected area because 541 deaths occur within 24hrs. Italy government starts to test their local people on February 21 in Codogno.

0-18 years people 2.1 % affected; 19-50yrs people 28.4% affected; 51-70yrs people 30.9% affected; older than 70 years 38.6% affected.

Table 3: Condition of novel COVID 19 in Italy¹⁴

Month	Confirmed cases	Death
March	84,593	12,399
April	99,666	15,539
May	27,551	5,448
June	7,599	1,352

There were high confirmed case and death during the month of March and April and gradually reduced during the month of May and June.

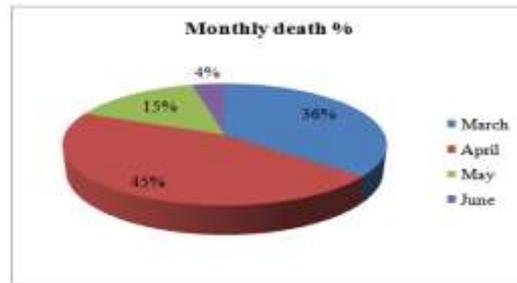


Figure 2: Monthly death percentage in Italy

There were 45 death percentages in the month of April and it gradually reduced to 4% in the month of June.

Table4: COVID19 cases in Italy¹⁵

Total cases	2,40,578
Recovered	2,05,811
Death	34,767

The mortality rate during the novel COVID-19 pandemic in Italy $34767/240578 * 100 = 14.45\%$

19 pandemicity taken the lives of US tremendously. The first case of COVID-19 was reported in January 21, 2020, a man of 30 years in Snohomish (Washington). The centers for disease control and prevention (CDC) confirmed the first case of 2019 novel corona virus.

Prevalence and mortality rate of COVID-19 in USA

America is third most populated country in the world estimated at 331,002,651 people by 2020. COVID-

Table 5: Conditions of novel COVID-19 in USA¹⁴

Month	Confirmed cases	Death
March	1,42,774	2,490
April	8,98,626	56,519
May	7,52,734	45,541
June	8,47,661	23,921

Table6: COVID-19 cases in USA¹⁵

Total cases	26,41,814
Recovered	10,93,927
Death	1,28,471

There were high confirmed case and death due to novel COVID-19 in the month of April and slightly reduced in May. In the month of June there were high confirmed case but death due to novel COVID-19 decreased.

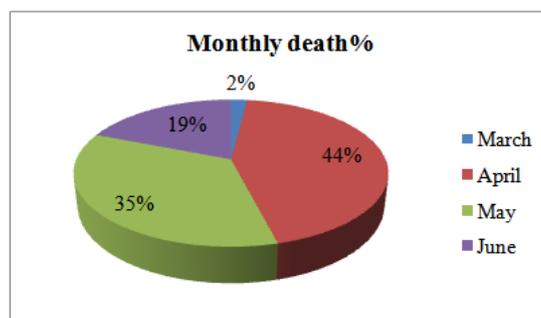


Figure3: Monthly death percentage in USA

April contributes 44% of total death due to novel COVID-19 and it reduced in the month of May and June.

The mortality rate of novel COVID-19 from the above data is calculated as $128471/2641814 * 100 = 4.86\%$.

Prevalence and mortality rate of COVID-19 in Spain

Spain is a European country with 4.69 crore of population. January 31 first confirmed corona virus

case in Spain, detected in German tourist in Canary who had touch with people travelled to china.

Table7: Conditions of novel COVID-19 in Spain¹⁴

Month	Confirmed cases	Death
March	94386	8189
April	119018	16354
May	25994	2584
June	10000	1228

There were high confirmed case and death during the month of April and gradually reduced in the month of May and June.

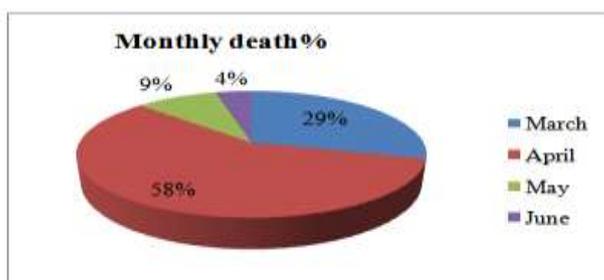


Figure4: Monthly death percentage in Spain

April contributes 58% of total death due to COVID-19 and it reduced to 4% in the month of June.

Table8: COVID-19 cases in Spain¹⁵

Total cases	2,97,181
Recovered	1,50,376
Death	28,355

The mortality rate due to novel COVID-19 from the above data is calculated as $28355/297181 * 100$ (per 1000 people) = 9.54%

SPANISH FLU:

The 1918 SpanishFlu pandemic spread over the entire world in less than six months and killed millions of people. Spanish Flu in three distinct waves. In march 1918, “spring” wave of flu believed to began in USA. The second or “fall” wave began in late August and quickly diffused throughout the world. Third wave occurred in the winter and spring of 1918-1919¹⁶. It is believed that one-third of the world’s population were infected in Spanish flu pandemic and considered as more than 50 million people died¹⁷.

SPANISH FLU IN CHINA:-

The impact of 1918 pandemic on china was not as serious as in the USA and Europe. This may be due to the 1918-19 influenza virus or a closely related precursor originated in china, so that many Chinese had prior exposure and hence obtained some immunity it is also believed the traditional Chinese medicine may have

played an role¹⁸. Its estimated that around 4,000,000 people died in China¹⁹.

SPANISH FLU IN ITALY

Italy was one of the European countries most severely affected by Spanish flu. It is estimated that around 4,66,000 were dead during the period of 1918-1920²⁰.

SPANISH FLU IN SPAIN:-

The Spanish flu pandemic was the worst pandemic that has occurred in Spain. The pandemic was responsible for above 257,080 deaths¹⁹.

SPANISH FLU IN USA:-

The USA first case was identified in spring 1918. The number of deaths occurred due to Spanish flu was estimated around 675,000 in USA¹⁹.

III. RESULTS AND DISSCUSSION:-

Here we made a comparative study of the mortality due to novel COVID-19 in four countries mainly China,Italy,Spain and USA. It is believed that the 1st case of COVID-19 confirmed in China and it had high

prevalent and mortality in the month of January and February and gradually reduced in the month of May and June. In Italy the first case was identified on 30th January and reached peak in the month of March and April with high confirmed cases and mortality. Italy have bended its curve in May and June as the cases gradually reduced. In USA, the 1st case of COVID-19 was confirmed on January 21 and had high confirmed cases in the month of April, May, June. Though the death percentage decreased in June. In Spain, the first case of COVID-19 was confirmed on January 31st. Both the confirmed cases and death were high during the month of March and reached peak in April and it gradually decreased in the month of May and June. China turned out its cases to almost zero. Italy and Spain bended their curve and there is gradual decrease in confirmed cases and death though America have high confirmed cases but the death percentage decreased in the month of June. This indicates high recovery rate. The prevalence of Spanish flu is believed to be one third of the world population and is much higher than that of novel COVID-19. When comparing Spanish flu mortality in china with its population is consider to be low. Similarly the mortality of COVID19 in china is consider to be low when compare with European countries and USA. European country like Italy and Spain severely affected by Spanish flu pandemic as like novel COVID19. Both Spanish flu and COVID19 had high mortality in USA. Even though millions of people are affected by COVID-19, the death rate remains low due to high recovery. In our view the mortality of Spanish Flu could not be reached by COVID-19.

IV. CONCLUSION

As we know that the second wave occurred in fall of 1918 during the Spanish flu pandemic had the highest death toll. The COVID-19 is considered to be in the first wave and still in high death toll. The second wave of COVID-19 is also expected in more virulent form. The Spanish flu came to an end as those people infected either died or developed immunity. Many health specialists believed that novel COVID-19 originated from bat. Bat is the only mammal that have the capacity to fly. Scientist relate their genetic modification associate with flight that favorable change to bat immune system it means that help too fight against the virus but not overreact them, preventing bat from many illness. Hence until vaccine and medicines are discovered for human so social distancing is the only way to stay away from novel COVID-19.

REFERENCE

- [1]. Archana G, Muthusamy M, Pakiavathy SV, Ushani U. Novel COVID-19-the pandemic on planet Earth-A brief insight into Transmission, Diagnosis and Treatment-A Review. International Journal of Research in Pharmaceutical Sciences. 2020 May 21; 11(SPL1):115-21.
- [2]. [https://www.history.com/topics/world-war-i/1918-flu-pandemic-5th June 2020,08.00am](https://www.history.com/topics/world-war-i/1918-flu-pandemic-5th-June-2020,08.00am)
- [3]. <https://www.livescience.com/spanish-flu.html> - 6th June 2020 ,10.30am
- [4]. Cascella M, Rajnik M, Cuomo A, Dulebohn SC, Di Napoli R. Features, evaluation and treatment coronavirus (COVID-19). InStatpearls [internet] 2020 Mar 8.StatPearls Publishing.
- [5]. [https://www.paho.org/en/news/25-3-2020-similarities-and-differences-covid-19-and-influenza-9th June:08.00pm](https://www.paho.org/en/news/25-3-2020-similarities-and-differences-covid-19-and-influenza-9thjune:08.00pm)
- [6]. Helton EL. Resources For Teachers: The 1918 Pandemic Influenza In Text And Images. Jeffrey Frank Jones; 2020 Mar 29.
- [7]. [https://www.theweek.in/news/sci-tech/2020/05/08/coronavirus-is-mutating-and-one-particular-strain-is-worrying-researchers.html-14th June](https://www.theweek.in/news/sci-tech/2020/05/08/coronavirus-is-mutating-and-one-particular-strain-is-worrying-researchers.html-14th-june) ;02.30pm
- [8]. [https://www.financialexpress.com/lifestyle/health/covid-19-scientists-identify-new-dominant-strain-of-sars-cov-2-say-it-could-be-more-contagious/1949971/-15th June;03.30pm](https://www.financialexpress.com/lifestyle/health/covid-19-scientists-identify-new-dominant-strain-of-sars-cov-2-say-it-could-be-more-contagious/1949971/-15th-june:03.30pm)
- [9]. [https://www.timesnownews.com/health/article/coronavirus-mutations-50-virus-strains-in-india-have-new-mutation-d614g-could-make-disease-more-contagious/588789-17th June ;04.15pm](https://www.timesnownews.com/health/article/coronavirus-mutations-50-virus-strains-in-india-have-new-mutation-d614g-could-make-disease-more-contagious/588789-17th-june;04.15pm)
- [10]. Kumari T, Shukla V. COVID-19: Towards confronting an unprecedented pandemic. International Journal of Biological Innovations. 2020;2(1):1-0.
- [11]. Harris JJ. H1N1 in the 'A1 Empire': Pandemic Influenza, Military Medicine, and the British Transition from War to Peace, 1918–1920. Social History of Medicine. 2020 May 1;33(2):604-21.
- [12]. [https://www.webmd.com/lung/coronavirus-history-22nd June ;04.00pm](https://www.webmd.com/lung/coronavirus-history-22nd-June;04.00pm)
- [13]. Vergano D. flu pandemic that killed 50 million originated in China, historians say. National Geographic. 1918.
- [14]. Worldometers. COVID-19 Coronavirus Pandemic.
- [15]. [https://www.statista.com/statistics/1043366/novel-coronavirus-2019ncov-cases-worldwide-by-country/-25th June ; 11.00am](https://www.statista.com/statistics/1043366/novel-coronavirus-2019ncov-cases-worldwide-by-country/-25th-June;11.00am)
- [16]. Patterson KD, Pyle GF. The geography and mortality of the 1918 influenza pandemic. Bulletin of the History of Medicine. 1991 Apr 1;65(1):4-21.
- [17]. <https://www.history.com/topics/world-war-i/1918-flu-pandemic>.
- [18]. Cheng KF, Leung PC. What happened in China during the 1918 influenza pandemic?. International Journal of Infectious Diseases. 2007 Jul 1;11(4):360-4.
- [19]. Johnson NP, Mueller J. Updating the accounts: global mortality of the 1918-1920 "Spanish" influenza pandemic. Bulletin of the History of Medicine. 2002 Apr 1:105-15.
- [20]. Fornasin A, Breschi M, Manfredini M. Spanish flu in Italy: new data, new questions. Infez Med. 2018 Mar 1;26(1):97-106.