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An overview on pandemic Covid-19

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ABSTRACT

The study aims to know about the Precautions to be taken in public during this pandemic; COVID-19. Pandemic is a worldwide spread of disease and Covid-19 which has been told as a pandemic was first found in Wuhan, A place in China. As this is pandemic, it is important to control this virus. Government has implemented various measures like self-quarantine, social distancing, lockdown, etc. in preventing this virus and also various other measures have been implemented during this pandemic. A thorough literature search was performed using the database like Pubmed, google scholar, BioRxiv, MESH, Cochran database using the keywords 'COVID -19,' pandemic 'and 'Precautions ' with no date and year restrictions. The language is restricted to English. 15 articles with similar data have been found which were analyzed and have been included in this study. It is very important to know pathophysiology, mode of transmission, precautions taken by the government during this pandemic to create knowledge about this pandemic which will be discussed in this study with the data collected from the articles collected.

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INTRODUCTION

Viral diseases continue to surface according to the WHO (World Health Organisation) and thus show-cases a grave public health issue. Multiple viral epidemics have been recorded over the last 2, such

as extreme acute respiratory coronavirus syndrome (SARS-CoV) from 2002 to 2003 and H1N1 influenza in 2009. On a recent basis, the Middle East coronavirus respiratory syndrome (MERS-CoV) was first identified in 2012 in Saudi Arabia (Geetha and Seshadri, 2020). The epidemic was enunciated a Public Health Emergency of International Concern (PHEIC) by the World Health Organisation on 30 January 2020 according to the International Health Regulations, as it had propagated to 18 countries among which four countries reported human-to-human transmission (Balasubramanian, 2020). On 26 February 2020, the first case of the disease was recorded in the United States, which was not imported from China (Harsha and Brundha, 2017). An outbreak that ordinarily has an effect on a large percent of the population is weighed a pandemic, occurring over a vast geographic zone (John and

Brundha, 2016). The governments worldwide are working to develop countermeasures to stem potential devastating effects (Brundha and Nallaswamy, 2019).

Health organizations are coordinating within themselves to overcome such devastating threats and to issue guidelines and directives to best mitigate the threat impact (Chandra, 2020). Simultaneously, scientists worldwide are working round-the-clock to develop information about the mechanisms of transmission, the clinical spectrum of disease, new diagnoses, prevention and therapeutic strategies speedily (Simon et al., 2020; Premkumar et al., 2014). The lack of certainty is still afloat regarding both the virus-host interaction and the evolution of the epidemic, in reference to the time when the epidemic reaches its peak (Shalini and Brundha, 2016). At the moment, the therapeutic schemes to deal with the infectious agents are only supportive, and prevention pinpointed on the reduction of community-level transmission is our best foot forward in defense. Old aged, children, and immune-compromised people are more susceptible to COVID-19 (Brundha et al., 2019).

Coronavirus- COVID-19

Coronavirus disease (COVID-19) is a newly discovered virus that causes a communicable disease. Worldwide, people are getting affected by this virus, resulting in moderate to severe respiratory tract infections and get cured without any particular treatment (Timothy et al., 2019). Older people who have underlying heart issues like cardiovascular problems, diabetes mellitus, chronic respiratory disease, cancer and immune-compromised individuals are more prone to the severe illness of this disease (Goyal et al., 2020).

It's very important for everyone to know how this virus spreads in order to know the mode of transmission and reduce the spread of this coronavirus (Malay, 2018). We can protect ourselves from getting contaminated by washing our hands using any alcohol-based soaps and using sanitizers, more than anything we will hand to stop touching our face very frequently because that is the only way for the virus to enter our body and cause severe complications in our body (Prashaanthi and Brundha, 2018).

As coronavirus spread by aerosol contact, it is very important to follow social distancing and respiratory etiquette like covering your nose or mouth while coughing, usage of disposable masks, tissues are preferred, and we will have to dispose of them immediately (Qi et al., 2020).

Prophylaxis of COVID-19: No vaccines have been

found until today. Many ongoing clinical trials are evaluating potential therapies for COVID-19 as soon as the medicines and vaccines are implemented WHO will update us (Kumar and Brundha, 2016).

PATHOPHYSIOLOGY OF COVID-19

CoVs are enveloped with nucleocapsid, and these are positive-stranded RNA viruses. Certain considerations must be addressed regarding the pathogenetic mechanisms of severe upper respiratory tract infection-CoV-2, its viral structure and genomic properties (Chew et al., 2020). These are very important when we study the properties of viruses (Brundha and Nallaswamy, 2019). Synthesis of polyprotein 1a/1ab has been noticed in the host and is started from viral RNA (Hannah et al., 2019). Now the transcription of virus works through replication- transcription complex (RCT) organized in double-membrane vesicles and then through the synthesis of sequences of subgenomic RNAs (sgRNAs) (Wade et al., 2020). Transcription termination occurs in transcription regulatory sequences, located between the open reading frames (ORFs) that act as templates for subgenomic RNA production. Minimum six ORFs are present, within the atypical CoV genome (Balaji et al., 2016). The frameshift is seen between ORF1a and ORF1b, which guides the production of both pp1a and pp1ab polypeptides, that can be later processed by virally encoded chymotrypsin-like protease (3CLpro)/main protease (Mpro), 2 papain-like proteases in order to produce 16 non-structural proteins (NSPs). Apart from ORF1a and ORF1b, other ORFs also encode structural proteins like spike, membrane, envelope, nucleocapsid proteins and accessory protein chains (Shenoy and Brundha, 2016). There are different types of coronaviruses which present different special structural and accessory proteins translated by dedicated sgRNAs (Preethikaa and Brundha, 2018). Pathophysiology and virulence mechanisms of CoVs, have links to the function of the NSPS and structural proteins. Various research has underlined that NSP has the ability to block host innate immune response (Brundha, 2015). Many of the above characteristics (e.g., those of NSP 2, and 11) are not yet described.

The spike glycoproteins consist of two subunits- S1 and S2, inside the structural elements of CoVs. It is to be noted that the S2 subunit contains a fusion peptide, a transmembrane domain and a cytoplasmic domain which is strongly preserved in SARS-CoV-2. In contrast with other SARS-CoVs, the spike receptor-binding domain contains only 40 percent

identity with an amino acid (Shreya and Brundha, 2017).

Pandemics

The word pandemic comes from the Greek word *pan-demos* which means 'all people belong.' It is said to be an outbreak when that typically affects a significant percentage of the population living around the world (Kalaiselvi and Brundha, 2016). COVID-19 is a new disease spreading all around the world. Till date, many pandemics have occurred throughout history, like smallpox, tuberculosis, influenza etc. One of the most destructive pandemics was Black Death, which killed 1350 over 75 million people. Pandemics can also occur in important agricultural organisms like livestock, crop plants, fish, and tree species. Pandemics are usually caused due to infectious agents which are able to spread rapidly. The death rate in a pandemic is very high when compared to an outbreak. The risk of pandemics in the future increases with the resistance to antibiotics. Just because the disease spreads very fast, we don't call it a pandemic; the disease must be an infectious one too. Example: cancer kills many people, but its etiology is different from a pandemic because cancer is not caused due to any infectious agent.

Precautions to be taken during COVID-19

To prevent the spread of COVID-19 one must wash their hands every day with water and soap and scrub them well enough for at least 20 seconds, the distance of minimum 6 feet should be maintained in between people, avoid touching your face, cover your mouth and nose with a mask while travelling outside and if you cough or sneeze, use tissues or respiratory etiquette. When you feel that you are unwell, stay home, self-quarantine, get rid of activities which might weaken your lung activities and also avoid travelling outside and stay away from large groups of people and practise social distancing which is a must.

Symptoms of COVID-19

People can get infected by COVID-19 in different ways (Simon *et al.*, 2020). Mostly, people who get infected can experience a mild to moderate illness and heal without even getting hospitalised or sometimes it may even be asymptomatic. The most common clinical symptoms include fever, dry cough, and fatigue. Serious symptoms include difficulty in breathing/ shortness of breath, chest pain, and loss of speech.

MODE OF TRANSMISSION

The very first cases of the COVID-19 disease involved direct exposure to food sold in Wuhan's

Huang Seafood Wholesale Market, so the main mechanism was said to be animal-to-human transmission (Balametov *et al.*, 2018). But that mechanism got subsided, and cases started showing human to human transmission. If someone has serious symptoms, they must seek immediate medical support. Doctors or health caretakers must be informed earlier before visiting them. People with minor symptoms will remain stable. Still, if symptoms are shown, they must be treated staying away from home. It can take 5-6 days on average for a person to show symptoms who got affected by the coronavirus, but it can also take up to 14 days.

Similar to other respiratory pathogens, like flu and rhinovirus, the transmission of coronavirus is also via respiratory droplets which are in turn due to coughing and sneezing (Li *et al.*, 2020). Exposure to the aerosol in a closed area leads to infection. Analysis of data collected about the spread of SARS-CoV-2 in China showed that the infection was mostly due to close contact between individuals. Family members, health care professionals, other individuals who are in close contact with the infected persons are more likely to get infected too.

Diagnosis and Prognosis of COVID-19

Diagnosis

Early stages of COVID-19 are not specific. Differential diagnosis methods should be able to diagnose both infectious and non-infectious diseases like vasculitis, rhinovirus, adenovirus, influenza, etc., and also a wide variety of common respiratory disorders. Rapid detection for testing antigens and other investigations to evaluate commonly spreading respiratory pathogens, even non-infectious conditions should be taken for suspected cases. Polymerase chain reaction (PCR)- This is a molecular diagnostic method that has been recently employed for testing COVID-19 (Diagnosis and treatment plan of Corona Virus Disease 2019, tentative sixth edition, 2020).

Prognosis

Primary data collected suggest that the rate of death reported ranges from 1%- 2% depending on the area of study and country. Mostly the fatality rate was high in the case of patients older than the age of 50 years. Children are more likely to have a very mild infection but can act as a vector for further transmission.

Measures were taken by the government

In order to reduce and prevent the spread of this newly discovered coronavirus (COVID-19), all employees, governments, educational institutes, public places should implement new precautionary measures. This will be put forward for the well-

being of the public by the interests of government employees.

The government is implementing new ideas everyday. In India, more than 28,529 people have been brought under community surveillance and monitoring according to the articles collected regarding the present situation.

International airports were closed, and suspected visas were seized till April 15, except diplomatic, official, UN or International Organizations, project visas, and Indians were strongly advised to avoid non-essential travel to nations abroad (Hemmati *et al.*, 2020). Even if they return into the country, they are subjected to 14 days of self-quarantine (Li *et al.*, 2020).

All governments worldwide are taking necessary measures like temperature checks before entering the government buildings, sanitization of hands at the entry points and people who have flu symptoms have been advised to take treatment or self-quarantine. The entry of visitors into the office was discouraged; the issue of temporary passes on a regular basis must be avoided (Mrudula, 2020). More likely, video call meetings are performed. Few government buildings, gyms centres were closed for public safety, Proper cleaning and disinfection were done in workplaces, mainly those surfaces which are touched very frequently. Washrooms are employed with sanitizers, soaps and proper running water.

All the officials on duty are advised to look after their health, and in case they seem to have respiratory symptoms like cold or fever, they must vacate the workplace as soon as possible after informing their senior officials. The board of authorities are requested to sanction leave whenever self-quarantine is necessary. Older workers, pregnant women, and people with underlying medical problems or people who are immunocompromised must take extra precautions. The department must take care as such; the employees are not subjected to any activities that directly have contact with the public.

There is also a revised list of 'Dos and Don'ts' in order to prevent the spread. We must avoid close contact with individuals having respiratory tract infection and wash our hands frequently. We must wear protective equipment while dealing with people who are sick. We should not contact wild or farm animals without any proper safety precautions. We must take care of our immune strength by taking proper vitamins, nutrients, and protein-enriched foods in order to build up a strong immunity against the Novel Coronavirus (Reyes-Bueno *et al.*, 2020).

CONCLUSION

After, referring to the data from articles, the conclusion has been given. It is necessary to wash our hands frequently, usage of alcohol-based sanitizers are important, Common flu has to be brought to the notice of the doctor and treated, it is very important to follow social distance. As Covid-19 is a pandemic, it is necessary to follow all of the above measures to protect ourselves and others and to get rid of this pandemic.

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Conflict of Interest

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