Review on Corona Virus, Pandemic, Precautions and Treatment; Current Situation in India

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ABSTRACT

There is a new public health crises threatening the world with the emergence and spread of 2019 novel coronavirus (2019-nCoV) or the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The virus originated in bats and was transmitted to humans through yet unknown intermediary animals in Wuhan, Hubei province, China in December 2019. There have been around 97,000 reported cases of coronavirus disease 2019 (COVID-2019) and 3400 reported deaths to date (05/03/2020). The disease is transmitted by inhalation or contact with infected droplets and the incubation period ranges from 1 to 14 d. The symptoms are usually fever, cough, sore throat, breathlessness, fatigue, malaise among others. The disease is mild in most people; in some (usually the elderly and those with comorbidities), it may progress to pneumonia, acute respiratory distress syndrome (ARDS) and multi organ dysfunction. The case fatality rate is estimated to range from 2 to 3%. Diagnosis is by demonstration of the virus in respiratory secretions by special molecular tests. Common laboratory findings include normal/ low white cell counts with elevated C-reactive protein (CRP).

Keywords: 2019-nCOV, SARS-CoV-2, COVID-19, Pneumonia, Review

I. INTRODUCTION

Under the coronoviridae family , coronavirus possesses enveloped , single – stranded, gram-positive RNA genome which has been detected in avian hosts and mammals ,including bats, camels, clogs and cats. Among previously known several coronaviruses , most are mild pathogenic to humans, but severe acute respiratory syndrome coronavirus (SARS-CoV) and the middle east respiratory syndrome coronavirus (MERS-CoV) caused severe human infection. (Md. Saiful Islam, et.al April 2020)

First case of corona virus was notified as cold in 1960. According to the Canadian study 2001, approximately 500 patients were identified as flue-like system. 17 to 18 cases of them were confirmed as infected with corona strain due to polymerase chain reaction.

Several case of severe acute respiratory syndrome caused by corona and their mortality more than 1000 patient was reported in 2003 and this year was the black year for the microbiologist. And when microbiologist started focused to understand these problems. After a deep exercise they conclude and understand the pathogenies of

disease and discovered as coronavirus, and till total 8096 patient was found as affected by corona virus. So in 2004, world health organization (WHO) and centers for disease control and prevention declared as " state emergency". Another study report of Hong Kong was confirmed 50 patients of severe acute respiratory syndrome while 30 of them were confirmed as corona virus infected. Covid-19 was first identified and isolated from pneumonia patent belongs to wuhan, china. (Dharmendra Kumar .et al, 2020).

Covid-19 was declared as a **'public health emergency of international concern'** by who on 30 January 2020. The name coronavirus disease is shortened to as covid-19. Coronavirus disease 2019 (covid-19) is caused by novel severe acute respiratory syndrome coronavirus 2 (sars-cov-2) and was first reported to the who as pneumonia of unknown aetiology in the Wuhan China on 30 December 2019. Corona virus is an RNA virus consisting of positive-sense single-stranded RNA of approximately 27-32 kb. Corona virus is spherical, RNA enveloped with club shaped glycoprotein. Corona viruses are four sub type such as alpha, beta, gamma and delta corona virus. Each of sub type corona viruses has many different serotypes. Same of them were affect human of other affected animals such as pigs, birds, cats, mice and dogs. (Jaideep C. Menon, et al, July 2020). There are six known corona viruses that typically cause infection in humans. Among these, coronavirus 229E, OC43, NL63 and HKUI generally cause mild cold-like symptoms, whereas severe acute respiratory syndrome – coronavirus (SARS-CoV) in 2003 and middle east respiratory syndrome-coronavirus (MERS-CoV) in 2012, caused severe respiratory diseases such as pneumonia and death. (Nivedita Prasad, et al , 2020).

The novel corona virus (COVID-19) earlier known only as the Wuhan virus, And then in south Korea, japan, Italy, Iran and finally spreads in India. It is given the name novel because it is a never seen before mutation of animal coronavirus. COVID-19 has spread across the globe and a pandemic was declared on 11 march 2020 by the WHO. Covid-19 is transmitted through respiratory droplets and contact routes respiratory droplets are defined by the WHO as >5um in diameter and can be either aerosols (<50um) or spatters (>50um). Although airborne transmission by droplet nuclei (<5um) has not been ruled out , it is unlikely to be the main route of transmission. Hence face shields, and use of mask was recommended. Aerosol-generating procedures are routinely performed in dentistry as SARS-CoV-2 has been found in saliva, it is also possible that COVID-19 can be transmitted by aerosolized saliva (precautions for dentists during covid-19 – Adrian H. Shi, et al, 2020).

It is believed that the virus may be attached with a wet market (with seafood and live animals) from Wuhan that was not complying with health and safety regulations. The Wuhan wet market has since been closed down indefinitely, the covid-19 is very similar in symptomatology to other viral respiratory infections. Cases very from very mild forms to very severe ones that can lead to serious medical condition or even death. It is believed that symptoms may appear in 2 to 14 days as the incubation period for the novel coronavirus has not yet been confirmed. As it is novel virus specific modes of transmission is not known. Originally emerged as animal source but now spreading from one person to other person. There has been speculation about the virus spreading while the carrier is not showing any symptoms, but that has not been confirmed as a scientific fact. Currently symptoms known are cough, acute onset of fever and difficulty in breathing. Out of all the cases that have seen confirmed, upto 20% have been declared to be severe. Complication that may arise as a result of being infected are pneumonia, sepsis, septic shock and ARDS (acute respiratory distress syndrome) suspicion should arise with the above mentioned symptoms and recent travel history to countries being affected by covid-19 or now more crudely travel to any foreign country. (Varsha Kachroo, Novel coronavirus (covid-19) in India : current scenario, March 2020).

Approximately 67, 780, 361 covid-19 case and 1, 551, 214 death were reported by WHO as of December, 09, 2020 with cases reported in more than 220 countries (covid-19 update, who, 2020). The number of people

infected by the corona virus in India crossed 9.74 million ; nearly eleven-month after the country reported it's first case in the state of Kerala on January 30,2020 (Kumar et.al.2020).

In India, Kerala was the first state which is being affected by covid-19 and the first Covid-19 case was confirmed in Thrissur district on 30 January 2020. By early march the state soon had the highest number of active cases in India mainly due to huge number of cases imported from other countries and states. And Kerala is that states, that has high recovery rate, low death rate and slow progression, of covid-19 cases in India. (Jaideep C Menon, et.al, may 2021). Subsequently, the pandemic has so far claimed more than 141360 lives in india. The national recovery rate has reached 95.66% and the cause fatality rate is down to 1.45% deu to "increasing to test '', tracking, timely and effective clinical management of the patients in critical care. "according to ministry of health and family welfare" (MOHFW) on December 08, 2020 (covid-19 update, covid-19 india,2020), India tested 149,836,767 cumulative sample by December 07 and 1,022,712 samples were tested on December 08,2020. Current status of reported positive corona virus disease cases in India are for more than expected. (Christianne de faria coelho-Ravagnani, et.al,2021).

This novel corona virus outbreak has burdened India's economic, medical and public health infrastructure. The gross domestic product (GDP) shrank by the steepest pace ever, 23.9% of the April -June period when the corona virus brought the country to a standstill. Apart from this, health related consequences caused by covid-19. Combined global public health and economic crises (Sugin Lal Jabaris S.et al, 2021). The entire health care organization will eventually need to adjust to black chain technology application to support and fight covid-19 outbreaks. Block chain technology application to the health line industry can improve information security management; health care data can be analyzed and transmitted while maintaining data privacy and security (Mohamed Torky and Aboul Ella Hussanien).

To solve such health related consequences Indian government has encouraged strictly the practice for social distancing and implemented complete nation-wide lockdown to contain the spread of virus (S. Sharma et.al,2020). As soon as few symptoms may extend from mellow to extreme or even dangerous. The symptoms start within 2 to 14 days after one gets tainted; this period is known as the incubation period. The subject showing symptoms or found positive are being kept under active monitoring or quarantine either in isolation words or comps under active medical custody. The key symptoms of the disease include fever, chest pain, rapid heartbeat, cough, sore throat and shortness' of breath. In the worst infected cases, severe acute respiratory syndromes and kidney failure were also . (corona virus-sars-cov-2 : an insight to another way of natural disaster, Sunil Chawla, et.al, 2020),

Some typical recommendation for preventing infection spread are

- Educate the population about the importance of prevention of infection. (postured med j , may 1 , 2020)
- Maintaining at least 1-meter distance with anyone.
- Covering face with an elbow while coughing or sneezing..
- Washing hands with soap regularly.
- Avoid face, eye and nose touch.
- Avoiding unnecessary animal contact.
- Staying quarantine if you are unwell.
- Refrain from smoking.
- Practice social distancing.
- Avoid large gatherings.
- Use alcohol-based sanitizer for cleaning hands and public surfaces and objects.

- Stay home if it is not much necessary to go out.

As per latest data (7th april 2020) by john Hopkins university and other tracking websites, there are currently more than 1.5 million people infected by the novel corona virus all around the world and near about 85 thousand deaths reported from different parts of the world. The top 10 countries with maximum number of infected cases are the united states of America, Spain, Italy, Germany, France, china, Iran, united kingdom, Turkey and , Switzerland . And maximum number of death are reported from Italy, Spain, united states of America , France and united kingdom.

Indian accounts for almost one-fifth of the world's population and is second leading country in terms of population in the world. India's good camaraderie with majority of the nations in the world and its helpful nature makes it a perfectly for other countries. Therefore , the analysis of covid-19 outbreak in India region is closely watched and monitored by the world. India has been following a nationwide lockdown since 22-march-2020 till today may-2021 to overcome this pandemic situation. (Rajan Gupta ,et.al, April 2021).

II. MATERIALS AND METHOD

in the study, they proposed a new CNN-based method of classifying covid-19, pneumonia , and no-findings chest x-ray images.

X-ray image dataset

In this work, they used 500 chest x-ray images of covid-19 obtained from the open-source GitHub repository, shared by Dr. Joseph C., and the covid-19 Radiography dataset. They also used the chest x-ray 8 database on no-findings and pneumonia images.

Table.1. Summary of the dataset use covid-19, coronavirus disease 2019.

Class	Number of images
No-findings	500
Covid-19	500
Pneumonia	500

Table.1 show the summary of the dataset they used, which was split into three folders : no-findings, covid-19, and pneumonia.

Proposed model –

To detect covid-19 cases, they had created a very simple CNN model composed of 10 convolution layers followed by batch normalization, maxpooling, a soft max layer, and three fully connected layers. The convolution layers have 32 filters, each of which has a kernel size of 3x3. They had used a batch normalization operation to normalize the input ; this operation has other advantages, notably reducing the training time and increasing the stability of the model. The activation function used was Leaky ReLU, which is a variant of the RELU operation used to prevent neuron death.

The Maxpooling method is used in the all pooling operations. It reduces an input by taking the maximum of a area determined by its filter. Neurons of that layer were connected to all the activation functions of the

previous layer. The main responsibility of the maxpooling layer is to classify the convolution features extracted from the images datasets into the defined classes.

The softmax layer is simply used to interpret the probability values of the results of the activation functions of the previous layer. In cases of diagnosed disease, the values can be interpreted in three classes finally, the three fully connected layers act as classifier . They use extracted features and evaluate the probability of an object's presence in the image. Usually, activation functions and a dropout layer are used to establish non-linearity and minimize overfitting, respectively (Amira Echtioui, et.al,2020).

As searched and analyzed targeted evidence-based guidelines issued in various countries affected by this pandemic up to date. The recommendation for the prevention and control of other epidemics caused by other pathogens belonging to the same family of coronavirus or others that present the same mechanisms to transmission also were searched and analyzed. Moreover , they checked and analyzed different scientific papers related to pharmacological approaches, clinical assessment of various personal protective equipment (PPE) of the respiratory tract and epidemiological data regarding this virus. In detail, they looked into all the best reports of the world health organization , the U.S.Food and drug administration , the Italian society of pharmacology, and the centers for disease control and prevention (CDC). Furthermore, they had identified more than 100 articles that use two primary sources to classify relevant information (Luigi Cirrincione, et.al,2020).

III. OBJECTIVES

The goal is to minimize the infection risk based on the latest scientific understanding of the virus by spreading awareness to people. The cases of positive patients i.e. covid-19 positive patient increasing day by day, to stop this government and doctors and paramedics are working to the best of their services. And people should follow and adhere to government advisories strictly. And we all Indians should take lessons from china and Italy that what have this novel virus can create. And to stop such things happening in India , our Indian government has putted many districts under lockdown keeping in view the rise in the number of case and keeping the condition in the phase 2 of the outbreak our government made same typical recommendations for protecting infection spread are :

- Maintaining at minimum 1-meter distance with anyone.
- Covering face with an elbow while coughing or sneezing
- Washing hands with soap regularly
- Avoiding face, eye and nose touch.
- Avoid less-cooked or raw meat.
- Avoiding unnecessary animal contact.
- Staying quarantine if you are unwell.
- social distancing.
- Avoid large crowds.
- Use alcohol-based sanitizer for cleaning hands and public surfaces and objects.
- Stay home if it is not much necessary to go out.
- Use face shield or mask after taking vaccines also.

Now , we should understand our responsibility positively that it is not for others or for government, it is for ourselves and for our families COVID-19 impacts the elderly and those with pre-existing health conditions most severely. In a spirit of the solidarity, we all have to be ready to contribute our part to protect those people

at highest risk. As individuals, practicing good hygiene and prevention measures as well as applying measures of social distancing, including avoiding crowded places, continue to be very important.

For all countries, the final aim is the same: stop transmission and prevent the spread of the virus to save lives.

IV. RESULT

It has been proved by (Amira Echtioui , et al) that a simple but effective cnn model of the detection of covid-19 disease from chest x-ray images. It demonstrates, their model classified the covid-19 and no-findings classes slightly better than the pneumonia class in terms of all the performance criteria, the classification of no-findings of covid-19 yields better results than the no-findings classes, hence it is simple but effective CNN model for the detection of covid-19 disease from chest x-ray images. Although they achieved a fairly high detection accuracy, precision, and recall of covid-19 this does not mean that it is a production-ready solution, especially with the limited number of images currently available.

The classification accuracies are 94.14%, 90.97% and 88.925 for the categories of covid-19 positive, pneumonia and no-findings, respectively.

The covid-19 Pandemic requires a more risk-benefit analysis with deciding the modality of respiratory support for patients, the risk for healthcare worker infection, nosocomial spread, availability of resources, and clinical spectrum of disease must all be considered.

The recommendations set out so for the prevention of covid-19 for from us. And it can be implemented by integrating the information based on the degree of the spreading risk of this virus in the country, determined by its location in relation to the areas of greatest risk and by the type of work carried out, as suggested by the guidance on preparing workplaces for covid-19.

Considering the lack of knowledge about the sars-cov-2 is transmitted, our goal is to develop a guide on the application of prevention and protective measures, after analyzing the latest publications on sras-cov-2 and the other corona viruses and on the prevention of respiratory diseases.

There is evidence of SARS- Cov-2 presence in patient stools, however, fecal-oral route transmission is still unclear previous reports revealed the capability of SARS and other corona viruses of surviving on an inanimate object and environmental surfaces. However, there is no report of sars-cov-2 presence in the environment except human market. The effectiveness of travel restriction, maintaining social distance, wearing a mask in the general public, hum or self quarantine is not clear although there are same studies an the treatment of covid-19, more study needed, several studies are focusing on the influence of environment parameters, such as temperature and humidity , an SARS- like viruses transmission. The seasonality of the outbreak is also required to study. More studies are needed to explore the role of environment in the spread of the virus and its viability that are crucial for adopting strategies to control covid-19 outbreak. Besides the environment, more studies are required to identify the intermediate host (s) of covid-19 because bats are known to be a reservoir of SARS - Cov-2.

V. DISCUSSION

India's healthcare system has limited capacities and a strong focus on primary health care delivery. The country's healthcare expenditure is 3.5% of the national GDP. However, only 1.28% of government public expenditure to the total government revenue is used for health care expenditure, indicating a high oop burden.

The country's limited health infrastructure capacities, as indicated in this paper, might result in higher case-fatalities, according to khan et.al, when adjust for healthcare expenditure , existing burden of non-communicable disease, the demographic profile of the country and population density , capacity of the health care negatively correlated with casefatalities. there are further implications of limited bare facilities and capacities, including the provision of primary health services.

After detecting the first case on 30 Jan 2020, India experienced a delayed growth in the case-count. However, there are indices that community transmission prevailed by March 2020, subsequently, India recorded a constantly increasing daily incidence date. As of 9 June, India's cumulative prevalence exceeded 300,000 COVID-19 cases with a doubling clime of eight days. The majority of cases being men and under 40 years of age.

Several mathematical projections modeled the outbreak according to different scenarios accounting for quarantine measures. However, early projection of the spread of COVID-19 in India appeared to overestimate the trajectory when compared with the reported outbreak development. The effectiveness in point – of entry screening was delaying the spread of COVID-19.

As indicated, the point –of-entry screening strategy by thermal scanning of only symptomatic passengers may be inefficient. this is supported by the finding in their baseline showing an estimate of 46% of travelers with COVID-19 would not be detected.

In March, India implemented visa restrictions for countries with a high COVID-19 burden and advised home quarantine for asymptomatic travelers entering India. On 25 March, the Indian government imposed a complete 21 day lockdown, including the suspension of domestic travel, closure of recreational places, gathering restrictions, and closure of nonessential business. In addition. The government released a relief fund with a volume of 20 lakh crore rupees (265 billion dollars). The government started deco fining by easing domestic travel restrictions on 25 May and implementing a deconfinement strategy with several lockdown phases according for regional epidemiological differences. Along with the WHO's social media awareness campaign via Whatsapp, India also released as Indian-centric version of the COVID-19 campaign to provide evidence-based information and curb the regulation of myths and false news and contact tracing Smartphone application mandatory for domestic travelers.

The magnitude of the economic impact is still unfolding as cases are increasing, and the government is compelled to take drastic measures for the management of COVID-19. Forecasts predict a plunge in GDP growth for India to the extent of 3.3% compared to estimation prior to the COVID-19 outbreak. As a law-middle income country, the challenge of fiscal responsibility on the growing demand of medical supplies added to the already low government public expenditure on health in a major concern not to be overlooked as it might slow the recovery rate of the Indian economy. The global slowdown in supply and production might have far-reaching consequences for the Indian pharmaceutical industry, notably as essential driver of the Indian economy moreover, Indian pharmaceutical companies therapeutic medical products crucial to the global response in tracking COVID-19.

VI. CONCLUSION

India is an immensely – populated country and hence, the country needs to take watchful steps. The cases are rising very fast and they need aggressive control strategies from the administrative units of India. Corona viruses are enveloped RNA viruses that cause respiratory illness of varying severity from the common cold to

fatal pneumonia it is more than just a common cold ranging from respiratory diseases to severe pneumonia. In the age of technology, due to the fast development of genome sequences of the novel virus, the research community was engaged rapidly in providing analysis, simultaneously developing antidotes and diagnostic tests. This is the first time any epidemic was so quickly and so accurately analyzed and predicted using machine learning and artificial intelligence paradigms. Many biotech companies are coming to fight against the corona virus global outbreak. The unique circumstances of the epidemic have made a tremendous interest in online clinical administrations and information, confinement to homes especially for kids is a serious matter of concern and will `have major impact on their mindset if the epidemic gets prolonged same superstitious aspects of corona virus researches have been unfolded and many aspects of the corona virus researches have not been unfolded ; such as predicting the impact and spread of the pandemic in upcoming days in the major countries of the world on different scales and different parameters. Effective containment can flatten the exponential growth curve of infection due to the pandemic. Mental health and stress level patterns during such pandemics can be detected and analyzed using artificial intelligence and deep learning.

Corona virus is spreading human to human to transmission by close contact via airborne droplets generating by coughing, sneezing, kissing and smooching, so avoid these activities with infected partners and family members. Corona virus may transmit through pet animal such as dog, cat, pig, cow, turkeys, so avoid content and separate them if observed any infection activities like diarrhea, cold, fever. As per WHO and ECDC guidelines avoid the contact with sick people and also avoid the market or public places as per possible. The use of masks, frequent hand-washing, proper sanitization, social physical distancing, avoiding crowds and a healthy life style must be the new normal life.

The cases are rising very fast and they need aggressive control strategies from administrative units of India. These are six different aspects covered up into relation to presenting the growth trends of infected cases in India, prediction for the number of infected cases for next few days, impact of social distancing on the citizens of India, impact of mass events on the number of infected cases in India, network analysis and mining of pollens on the patients suffering from corona virus, and analyzing the strategies for uplifting lockdown in India. The current study implemented various technique to present the data analysis and the results are in sync with few limited studies available in the literature. This study will be useful for the government of India and various states of India, frontline health workforce of India. Researchers and scientists. This study will also be favorable for the administrative units of other countries to consider various aspect related to the control of COVID-19 outspread In their respective regions.

To contain the spread, foremost emphasis is essential on the rigorous testing, necessary equipment, ventilators, and research and development activities. Regular counseling of people is also imperative to reduce the mental-stress which is inevitable in such difficult situations, it is vital to come up with the sustained advance mental policies after the COVID-19 experience to deal with such unprecedented circumstances with a holistic approach. One has to win this war quite intelligently with the public support and alertness. In a way , COVID-19 has taught people the highest discipline of life.

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