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Research Article

POTENTIAL IMPACT OF CORONA VIRUS ON WORLD¹Dr Ayesha Iqbal, ²Dr Suraiya Hirani, ³Dr Sandhiya Salim, ⁴Dr Sarah Hanif,¹Assistant Professor, Department of Oral Pathology, Sir Syed College of Medical Sciences²Senior Lecturer, Department of Oral Biology, Sir Syed College of Medical Sciences³Lecturer, Department of Community Dentistry, Sir Syed College of Medical Sciences⁴Lecturer, Department of Oral Biology, Sir Syed College of Medical Sciences**Article Received:** February 2020**Accepted:** March 2020**Published:** April 2020**Abstract:**

Coronaviruses (CoVs) are an outsized family of enveloped, positive-strand RNA viruses. The non-SARS (non-severe acute respiratory syndrome) like HCoVs are worldwide endemic which accounts for a considerable segment of upper respiratory tract infections. They can rarely cause severe diseases in compromised subjects however do not grounds any major (fatal) epidemics. In divergence, SARS like CoVs (namely SARS-CoV) can be a reason for extreme short-lived fatal outbreaks. The existing epidemic is rapidly spreading worldwide causing a major fear by the highly contagious SARS-CoV-2. To hand we have an ample knowledge about the new SARS-like virus which is named as CORONA for its pandemic potential. It might be guessed that SARS-CoV-2 epidemic is exceptionally underdiagnosed and silently spreading worldwide with two concerns: (i) masses of severe infections amongst poor health subjects could randomly occur interrelated to unrecognized index cases; (ii) the recent epidemic could logically fall into a low-level endemic stage once a substantial amount of subjects will have strong immunity Equally on 31 January 2020, this epidemic had blowout to 19 countries with 11,791 definite cases, including 213 deaths. The World Health Organization (WHO) has stated it as a Public Health Emergency of International Concern. Later on March 11, 2020 COVID-19 was called off as pandemic. There are various drug trials testing carrying on with nearly positive results. Conversely, there has been no vaccine available upto now hence, the finest way to fight with the virus is by preventive methods like washing hand frequently and keeping social distancing mainly.

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INTRODUCTION:

Beginning in December 2019, a bunch of pneumonia cases had been identified by Chinese health authorities in the city of Wuhan, in Hubei province. The pathogen causing the viral pneumonia among affected individuals is the new coronavirus SARS-CoV-2 (1, 2). Initially labelled as corona virus in the 1960s, it catches its name from a unique corona or 'crown' of sugary-proteins that ventures from the envelope surrounding the particle. Coding the virus's make-up is the longest genome of any RNA-based virus – a nucleic acid of single strand roughly 26,000 to 32,000 bases long. There are four notorious genera in the family, named *Alphacoronavirus*, *Gammacoronavirus*, *Betacoronavirus* and *Deltacoronavirus*. *Gammacoronavirus* mostly infects birds such as poultry, while *Deltacoronavirus* can infect both birds and mammals. The remaining two only infect mammals, including cats, bats, pigs and humans (3). Severe Acute Respiratory Syndrome was foremost documented as a discrete strain of coronavirus in 2003. The cradle of the virus has never been clear, nevertheless the first human infections can be sketched back to the Chinese province of Guangdong in 2002. Most cases from the preliminary cluster are epidemiological associated with a live animal market (Huanan South China Seafood Market), suggestive of a potential of zoonotic origin. Yet, the absolute source of the virus is mysterious. Infections in at least one family cluster (4) and in healthcare workers endorse the incident of human-to-human transmission, though the degree of this mode of transmission is unclear (3). In the initial phases of this pneumonia, respiratory infection symptoms occurred, with some patients rapidly developing acute respiratory distress syndrome (ARDS), along with acute respiratory failure, and other severe complications. On Jan 7, a novel coronavirus was extracted by the Chinese Center for Disease Control and Prevention (CDC) from the throat swab sample of a patient, and was consequently named 2019-nCoV by WHO (2). The detaching of severe acute respiratory syndrome coronavirus (SARS-CoV) into saliva droplets imparts a critical role in viral transmission. The cause of high viral loads in saliva still remains indefinable. However Liu, L. et al. in 2011 examined the primary target cells of infection in the entire group of respiratory tissues in Chinese macaques after intranasal inoculations with a single-cycle pseudo typed virus and a pathogenic SARS-CoV. And they concluded that angiotensin-converting enzyme 2-positive (ACE2⁺) cells were broadly distributed in the upper respiratory tract, these cells lines salivary gland ducts were the early target cells were commendably

infected (5). Early studies showed SARS-COVID to be an animal to human transmission, while recent studies increasingly showed their mode of transmission to be human to human either by air droplets or direct contact through skin surface (6, 7). The SARS-COVID is a positive sense corona virus which is enveloped and unsegmented, belonging to the beta corona family of viruses (8). Host factors include SARS-COV2 receptor i.e. Human angiotensin converting enzyme 2 (hACE2). Individuals with low immunity and having underlying diseases such as Hypertension, Cardiovascular Disease, Diabetes mellitus and Chronic Obstructive Pulmonary Disease are more susceptible to this virus. Moreover, elderly and newly born are more prone to this disease because of their weak immune system (9). The epidemic of the SARS-COVID virus breaking out in the city of Wuhan, China seems to be sea food related. Studies have shown Bat as a potential reservoir for COVID-2 (10, 11). According to the Centers for Disease Control and Prevention, the incubation period for the novel Corona virus is 2 to 14 days after the person is exposed. However mean average for the incubation in most patients is 5 days (12). The symptoms for the COVID include Fever most commonly, followed by Dry cough, difficulty in breathing, pain in muscles, Headache and diarrhea. However, some patients also presented with runny nose and sore throat (2). Upon admissions to hospitals, the most common laboratory findings in such patients are reduced lymphocytes due to weak immune system in a Complete Blood count and upon chest Computerized tomography scan of chest Bilateral Ground glass consolidation or opacity can be seen (4). Complications include Acute Respiratory Distress Syndrome, Acute kidney injury, Acute cardiac injury, Co- or secondary infection, Shock (13). The Health Care workers such as medical and paramedical staff including medical doctors, Dentists, Nurses, Biologists etc. are most prone to Corona. The epidemiological studies show the quantity of number of cases found in these health care personnel assessing the risk factors of subclinical and asymptomatic infections among them (12).

CASES WORLD WIDE:

As of 27 March 2020, a total of 81,782 cases have been detected and confirmed in Mainland China and worldwide, there are more than 533,416 additional cases detected and confirmed in 72 countries (1). The outbreak was declared a Public Health Emergency of International Concern on 30th January 2020 when the cases had reached 10 fold as compared to when the outbreak began (14).

In this struggle, both the domestic and international spread of the novel coronavirus (COVID-19) is referred as epidemic. The effects of

the travel ban implemented in Wuhan as well as travel restrictions adopted by several countries in early February, 2020 was assessed and it was demonstrated with the help of a study that additional travel limitations had uncertain effect in reduction of disease transmissibility unless paired with public health interventions and behavioral changes. The model also indicates that even in the presence of the strong travel restrictions in place to and from Mainland China since 23 January 2020, a large number of individuals exposed to the SARS-CoV-2 have been traveling internationally without being detected. So it was expected that travel limitations to COVID-19 affected areas along with transmission-reduction interventions will provide synergistic effect and greatest benefit to alleviate the epidemic (15). According to situation report by WHO three new countries from the region of Americas and African Region have reported cases of COVID-19 till date (16). An analysis was made on international airline passenger travelling from the following 10 cities: Wuhan, Beijing, Shanghai, Kunming, Chengdu, Xiamen, Haikou, Guangzhou, Shenzhen and Hong Kong. It was derived from the collective data that Taipei, Bangkok, Tokyo, Seoul and Singapore received the highest number of passengers from the abovementioned cities. Most of the cities receiving highest volume of arriving passengers were in Asia alongside UK and other European cities included Paris and Moscow, while Sydney ranked 11th and New York and San Francisco received highest volume to North American region. Cairo being the only African city represented in the top 50 destinations, whereas no evidence of South American city represented (17).

In the first week of February 2020 multiple sources reported delivery of newborn infant during the epidemic in Wuhan Children's Hospital had tested positive for 2019-nCoV 30 hours following its birth. The infant had reported to have stable vital signs, no fever or cough, but had shortness of breath together with abnormal chest radiographs and abnormalities of liver function. This puts our attention towards a possibility of mother-to-child transmission (7, 17). In addition to another report, a baby that had been delivered on 13 January 2020. Following its birth, the infant's nanny was diagnosed with 2019-nCoV, and the mother was diagnosed days later. In the following week, the baby began to develop symptoms (17).

In light of these facts, it is important to remember that newborn infants can acquire an infection ways other than intrauterine maternal-fetal transmission. Such as when the infant passes through the birth canal during a vaginal delivery or through post-partum breast feeding. Or in some cases it can occur after delivery through such mechanisms as inhalation of the agent through aerosols produced

by coughing from the mother, relatives or healthcare workers or other sources in the hospital environment. Although based upon past experience with pregnant women who developed MERS and SARS, and realizing that the numbers are limited, there has never been confirmed intrauterine coronavirus transmission from mother to fetus, however pregnant women should be considered to be at high risk for developing severe infection during this current outbreak of 2019-nCoV (17).

China, becoming the centre of an outbreak of pneumonia of unknown cause, raised intense attention not only within its borders but internationally (2). Recent case reports suggested that the first two cases detected in Italy were on January 29, 2020, when a couple from the city of Wuhan who travelled to Italy were admitted to the Lazzaro Spallanzani National Institute of Infectious Diseases, in Rome, after becoming ill, presenting with respiratory tract symptoms and fever. Respiratory sample tests were collected and the laboratory results confirmed infection with SARS-COV2 infection (18).

According to additional case reports, on February 20, 2020, another case of a young man came forward in the Lombardy region of Italy showing symptoms similar to that of an atypical pneumonia that later ascertained to be COVID-19. In the next 24 hours there were 36 new cases. This was the beginning of one of the largest and most serious clusters of COVID-19 in the world. The disease continues to spread and the number of affected patients kept raising despite aggressive containment efforts and the case-fatality rate has been very high specifically dominated by very old patients (19). The approximation of the global risk of importation of 2019-nCoV and its spread from major Chinese cities to the most frequent international travel destinations was made by a few studies on global risk spread. Wu et al. estimated the threat of international spread was high as compared to domestic outbound flight, indicating that the countries outside China were at highest risk of 2019-nCoV transmission including Thailand, Cambodia, Malaysia, Canada and the USA, all of which have reported at least one case which skyrocketed forcing countries to announce drastic measures, including school closure and lockdowns (1).

Another possibility being that a major Chinese population lives in Europe and North America in conjunction with an increasing amount of Chinese tourism which poses a high risk of 2019-nCoV travelling across international borders. Although chances of acquiring a case are low for these countries, the consequences are likely to be much higher because of the country's capacity to control

such situations through any measures knowing its healthcare systems (20).

In light of available evidence and supplementary facts, WHO recommends performing hand hygiene and regularly cleaning and disinfecting surfaces. Where aerosol generating procedures are performed, it is highly endorsed to use medical masks and respirators as the evidence suggests that the virus can spread directly from person to person when a COVID-19 case coughs or exhales producing droplets that reach the nose, mouth or eyes of another person. As another possibility, as the droplets are too heavy to be airborne, they land

on objects and surfaces surrounding the person infecting other individuals as they touch these contaminated objects or surfaces, then touches their eyes, nose or mouth (21). Japan being one of the most developed countries of the world, reported 1387 cases of Corona in Japanese population with respect to 27th march, 2020. On 5th February 2020, A Cruiseship named "Diamond Princess" having 3711 people went in quarantine for a period of 15 days as a passenger was detected a positive Corona patient. By 20th February 2020, a huge quantity of 634 patients were found to be tested positive on board with the causative organism (15).

	PCR tested positive	With symptoms										Under confirmation of the symptom	Death	PCR tested
		With no symptoms		With symptoms						Under confirmation of the symptom				
		Already discharged from hospital	Need inpatient treatment	Currently in hospital	Waiting for hospitalization	Already discharged from hospital	Need inpatient treatment	Mild to moderate symptoms	Hospitalized with a ventilator or intensive care unit	Under confirmation	Waiting for hospitalization			
Domestic cases (excluding returnees by chartered flights)	1349*1 (+96)	131 (+4)	37 (+2)	92 (+2)	7 (+2)	1,191 (+72)	319 (+11)	828 (+63)	563 (+59)	203 (+1)	6 (+1)	27 (+20)	46 (+1)	24,663 (+1,805)
Airport quarantine														1,513 (+29)
Returnees by chartered flights (Identified by quarantine policy)														
Total	1,387 (+96)	148 (+4)	41 (+2)	105 (+2)	7 (+2)	1,212 (+72)	331 (+11)	837 (+63)	572 (+59)	203 (+1)	6 (+1)	27 (+20)	46 (+1)	27,005 (+1,834)

(a)

Hospitalization and discharge

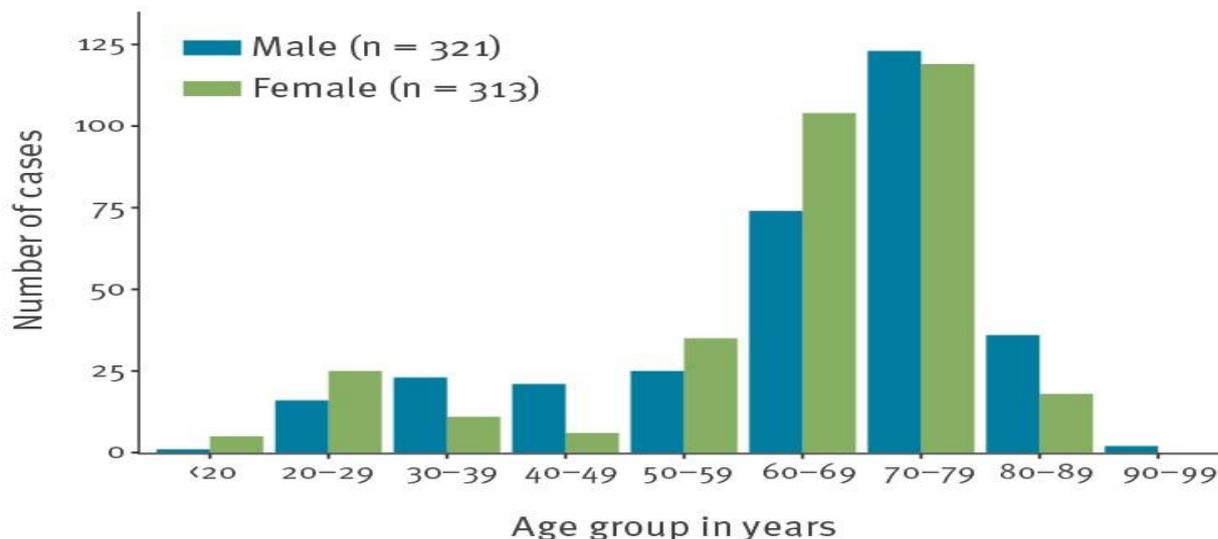
As of 18:00, Mar. 26

【Domestic cases】			
PCR tested positive			
	Currently in hospital	Already discharged from hospital	Death
1,387 (+96)	969 (+82) <small>From severe to moderate/mild symptoms 26</small>	372 (+13)	46 (+1)
【Cases at the Cruise ship】			
PCR tested positive (in hospital in Japan)			
	Currently in hospital	Already discharged from hospital	Death
672	59 (-2) <small>From severe to moderate/mild symptoms 29</small>	603 (+2)	10
【Total】			
PCR tested positive (in hospital in Japan)			
	Currently in hospital	Already discharged from hospital	Death
2,059 (+96)	1,028 (+80) <small>From severe to moderate/mild symptoms 55</small>	975 (+15)	56 (+1)

The number in parentheses indicates the change from the previous day.

(b)

CONFIRMED CASES IN JAPAN (a) (b)



Age distribution of reported coronavirus disease 2019 cases on board the Diamond Princess cruise ship stratified by sex, Yokohama, Japan, 20 February 2020 (n = 634 cases)

The virus has crossed several geographical limits distressing almost every country in the world making an urgent need to take forceful and prompt actions to change the course of the disease. COVID-19, being just like any other flu disease has shown that the mortality rate is very low and preventive measures and implementation on strategic plans can result in control of the disease, eventually eradicating it.

Pakistan's southern region is reported to be worst-affected with virus and as many as 15 cases have been test positive till February 2020. Along with other countries, Pakistan has also stepped up the game and designed proper control strategies to fight against COVID-19 including strict health screening at airports and borders, significant steps has been undertaken to promote social distancing, isolation and quarantine. Also there have been efforts commenced by public health and preventive medicine experts for early diagnosis and prompt treatment (22). There is prompt need of immediate Chinese health authorities who did an immediate exploration to distinguish and control the disease, together with an isolation of people doubted to have the disease, close observing of contacts, clinical and epidemiological data collection from patients, and improvement of diagnostic and treatment procedures (3).

DIFFERENTIAL DIAGNOSIS:

The COVID- 19 which is also named as severe pneumonia by Taiwan CDC and is notifiable communicable disease of fifth category. The differential diagnosis comprises of entirely all kinds of respiratory viral infections [respiratory

syncytial virus (RSV), adenovirus influenza, parainfluenza, non COVID-19 coronavirus human metapneumovirus, bacterial infections and atypical organisms (chlamydia, mycoplasma). Consequently it is imperative to take travel history or else it is not possible to discriminate COVID-19 from the above infections clinically or by routine lab tests (23).

CONCLUSION:

The outburst of COVID-19 brushed across China speedily and according to WHO 2020 situation report had shown a blowout to multiple countries around 85 countries/zones/parts outside of China updated on March 5 2020. Still the urge for treatment is out to be sort out but on the other hand scientists have made headway in the characterization of this. We have precise the knowledge, up-to-date of SARS-CoV-2 as follows: Primarily, the incipient pneumonia, COVID-19, initiated by SARS-CoV-2, exhibits less virulence but strong infectivity, related to MERS and SARS, in terms of illness and death. Secondly, the vulnerable residents includes the elderly people with positive history of medical conditions or any co-morbidity, which needs additional attention and care. Lastly so far, the subsidiary treatments, together with effective antiviral drugs, such as chloroquine, remdesivir or lopinavir/ritonavir, have shown definite effect on the treatment of COVID-19 patients, whereas confirm data from further clinical trials are looked-for. Yet, queries stay vague and further studies are urgently required to discover its character, transmission and pathogenicity mechanism of the developing coronavirus. For now, to expose the mystery of the molecular mechanism of viral access and its

multiplication, which provides a hint for the basis of future research to develop antiviral drugs and vaccines. The Chinese Government and the system have propelled psychological intervention, and we sincerely have a faith that the affected countries along with the Chinese people overcome the epidemic COVID-19 as fast as possible.

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