

COVID-19 Outbreak: Spread, Symptoms, Treatment and Research

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Dear Editor,

The pandemic of COVID-19 (SARS CoV-2 or 2019-nCoV), a disease characterized by array of symptoms leading to severe acute respiratory problems, began in the Central Chinese city of Wuhan.¹ Wuhan is a city where almost 11 million people reside and it was hit by this pandemic in December 2019. Patients having this disease mostly suffered from respiratory disorders from a previously unknown causative agent. It was thought that this novel pathogen emerged from the seafood market of Wuhan. The causative agent is identified as a closely related member of severe acute respiratory syndrome Coronavirus (SARS-CoV). Coronaviruses family is a large family which contains several viruses including Middle East Respiratory Syndrome virus (MERS-CoV) besides SARS-CoV.² The first case which was reported in Wuhan December 2019 had symptoms resembling to (SARS) and MERS.

Historically this family of Corona viruses has had a major health and socio-economic impact. In 2003, the SARS-CoV caused 8096 infections worldwide with a case-fatality rate of 9.6% and a total

societal cost estimated at 40 billion USD. In 2012, the thus far unknown MERS-CoV appeared which caused 2249 cases with a case-fatality rate of 36%.³

The pathogen was suspected to be from the family of enveloped positive-sense RNA viruses, characterized by an unusually large RNA genome, distinctive replication strategy and club-like spikes that project from their surface. As reported by different researchers these viruses cause diseases in other mammals besides lethal respiratory tract infections in humans. Chinese scientists sequenced the RNA genome of this fast-emerging virus early in 2020.⁴ Then it was allotted a name by WHO as a novel Coronavirus 2019 causing an array of symptoms now referred to as COVID-19.

Considering the virulence potential and aggressive measures employed by the Chinese authorities to stem this deadly outbreak, World Health Organization has been issuing warnings before declaring it as a pandemic on March 11, 2020.⁵ At the time of writing, it has spread to 184 countries with over 6.19 Million total infections and 0.37 million deaths reported worldwide. As per Pakistan National Institute of Health (NIH) data, total confirmed cases in Pakistan on 8th June, 2020 were more than 100 thousands. The new cases reported in last 24 hours were 4,728 and there have been 67 deaths. Case Fatality Rate comes out to be a little over 2 % but there are various unofficial estimates that the case number may be many folds higher.

Out of these infections, 35308 have been reported in Punjab, 34889 in Sindh, 12459 in

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Khyber Pakhtunkhwa (KPK), 5776 in Baluchistan, 4323 in Islamabad Capital Territory (ICT), 897 in Gilgit-Baltistan (GB) and 331 cases in Azad Jammu and Kashmir provinces. Metropolitan cities such as Lahore, Peshawar, Rawalpindi and Karachi have seen a sharp incline in the number of cases after 24th May 2020. All major hospitals have made necessary arrangements when it comes to setting up isolation wards having beds in quarantine settings for patients that require emergency treatments. The United Nations Conference on Trade and Development (UNCTAD) on 30th March 2020 bracketed Pakistan among the countries which would be the hardest-hit economically by the global pandemic of Coronavirus. The UNCTAD also demanded a raft of measures for the relief of countries falling in this bracket.

The majority of the infected people have recovered after showing an array of symptoms characterized by fever, cough, shortness of breath and loss of sense of smell and taste. Understanding of its transmission via droplets is set to modify several social codes and restriction on human interactions.⁶ The magnitude of problem is amplified by the absence of pharmaceutical solutions such as drugs and vaccines. For developing countries, it is more challenging as compared to developed countries.⁶

The COVID-19 pandemic has boosted the development of preventive (i.e., vaccines) or therapeutic (i.e., antiviral drugs) interventions to address serious SARS-CoV-2 infections in humans. So far, except for quarantine measures, still no authentic and approved effective intervention exists.

Prevention is key, therefore the main approach to control COVID-19 disease is to give adequate funding for adopting preventive measures, give awareness to the people about SARS-CoV-2 transmission and spread. It is empirical that the masses adapt various risk mitigation strategies such as avoiding crowded places, washing hands for 20 seconds or more, avoiding contact with sick people, wearing masks, gloves and using sanitizers. The death rates from COVID-19 infection can be reduced by following social distancing and proper symptomatic clinical management of infected patient's i.e. early diagnosis of COVID-19 infection and proper training of concerned medical and

paramedical staff. Most importantly COVID-19 surveillance (development of mass level testing facilities) should be the part of national health information system. Moreover rapid research grants from different government funding agencies should be given in order to conduct different clinical trials of already approved antiviral drugs and new drug molecules as well. By following the upcoming trend of this viral infection implication of control program should be managed and scheduled.

A variety of drugs have been tested recently in search for a suitable cure including ribavirin, nafamostat, interferons, corticosteroids etc.^{3,8} Hydroxychloroquine has been found to be efficient on COVID-19 and reported to be improving clinical symptoms in Chinese COVID-19 patients while similar effects have been demonstrated in French patients.⁷ Combining it with Oseltamivir and Azithromycin has shown further promising results in most recent studies.⁸ However, these findings are yet to be tested in Pakistan where COVID-19 is being reported across the country. In this regard a clinical trial is currently in progress with the name of Pakistan Randomized and Observational Trial for Evaluating Coronavirus Treatment (PROTECT®) being conducted by the University of Health Sciences, Lahore and its partner institutes and organizations. It is a multi-arm and multi-center trial aiming to enroll more than 1000 patients in various arms. The trial is direct consequence of the initiative taken by Prime Minister's Task Force on Science and Technology. Our hope is to be able to come up with relevant data that is translational and has direct impact in clinical setups that are at the forefront of dealing with this pandemic.

CONFLICT OF INTEREST

None to declare.

FINANCIAL DISCLOSURE

None to disclose.

REFERENCES

1. Tuite AR, Ng V, Rees E, Fisman D. Estimation of COVID-19 outbreak size in Italy. *Lancet Infect Dis.* 2020; 20(1): 537.
2. Apaydin CB, Cesur N, Stevaert A, Naesens L, Cesur Z. Synthesis and anti-Coronavirus activity of a series of 1-thia-4-azaspiro[4.5]decan-3-one derivatives. *Arch Pharm Chem Life Sci.* 2019; 352(11): e1800330.
3. Cao B, Wang Y, Wen D, Liu W, Wang J, Fan G, et al. A Trial Of Lopinavir-Ritonavir In Adults Hospitalized With Severe Covid-19. *N Engl J Med.* 2020; 382 (3), 1787-99.
4. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al. Immediate psychological responses and associated factors during the initial stage of the 2019 Coronavirus disease (COVID-19) epidemic among the general population in China. *Int J Environ Res Public Health,* 2020; 17 (2): 1729.
5. Wang X, Zhang X, He J. Challenges to the system of reserve medical supplies for public health emergencies: reflections on the outbreak of the severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2) epidemic in China. *Biosci Trends.* 2020; 14 (3): 3-8.
6. Wang M, Cao R, Zhang L, Yang X, Liu J, Xu M. Remdesivir and chloroquine effectively inhibit the recently emerged novel Coronavirus (2019-nCoV) in vitro. *Cell Res,* 2020;30 (3): 269-71.
7. Wang L, Gao YH, Lou LL, Zhang GJ. The clinical dynamics of 18 cases of COVID-19 outside of Wuhan, China. *Eur Respir J.* 2020. [Epub ahead of print]. Doi.org/10.1183/13993003.00398-2020
8. Gautret P, Lagier JC, Parola P, Hoang VT, Meddeb L, Mailhe M, et al. Hydroxychloroquine and azithromycin as a treatment of COVID-19: results of an open-label non-randomized clinical trial. *Int J Antimicrob Agents.* 2020; 105949. [Epub ahead of print].

Author's Contribution

UA, AR:Conception of idea, acquisition of data, intellectual input and drafting of manuscript.

MS: Conception of idea and final approval of the version to be published.

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