Short Communication

International Journal of Research in Pharmaceutical Sciences

Published by JK Welfare & Pharmascope Foundation

Journal Home Page: www.ijrps.com

The Mystery of low COVID-19 Mortality rate in India

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Article History:

Received on: 21 Sep 2020
Revised on: 03 Oct 2020
Accepted on: 05 Oct 2020

Keywords:

COVID -19,
Mortality rate,
India

Abstract

The Coronavirus Disease 2019 (COVID-19) caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) has emerged in December 2019 and was declared a pandemic by the World Health Organization. It has ruined the global population by striking the health of individuals. It is an extremely contagious disease and has caused a high rate of mortality, specifically in high-risk individuals. The pattern of infection and mortality rates has been diverse considerably among countries. Unexpectedly, more affluent countries with greater healthcare facilities have been more affected by it and have seen higher mortality rates, compared to less affluent countries like India and other Southeast Asian nations. In India, the mortality rate due to COVID -19 is comparatively less (2.87%) as compared to the rest part of the world. (6.45%) There are various factors which are related to mortality in COVID-19 pandemics, such as age and immune status of the patient, food culture, geographical condition and status of vaccination. India's health system has also come up with evidence-based guidelines that assisted in bringing in a resemblance of consistency in-patient care across the country. Association with private providers and improvement of testing modalities and guidance on isolation and quarantine, All these factors to be studied in detail which further may be used as therapeutics modalities to fight against the severity of COVID-19 from which we can save millions of life.

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ISSN: 0975-7538

DOI: https://doi.org/10.26452/ijrps.v11iSPL1.3586

Production and Hosted by

IJRPS | www.ijrps.com

INTRODUCTION

The Coronavirus Disease 2019 (COVID-19) caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) has emerged in December 2019 and was declared a pandemic by the World Health Organization (Sarode *et al.*, 2020). The common clinical symptoms of the patients suffering from COVID-19 are fever, cough, shortness of breath, myalgia (muscle pain), and tiredness. Whereas it may also show, symptoms like headache, hemoptysis, stomach pain, dizziness, nausea, diarrhoea, and vomiting (Fini, 2020). In India, the mortality rate due to COVID -19 is comparatively less (2.87%) as compared to the rest part of the world. (6.45%) (Ray, 2020). There are various factors which are related to mortality in COVID-19 pandemics, such as age and immune status of the patient, food culture, geographical condition and status of vaccination.

In India, 65% of the population is younger, having less than 35 years of age. Younger individuals may fight against infection COVID-19 through their better immunity (The Lancet, 2020).

In developing countries like India, most of the pop-

ulation is continuously exposed to microbes due to low socioeconomic status. This helps them to build primed immunity (Varshney, 2020). Apart from this, 68.86% of the population is rural-based, and so the portability of them is less as compared to the urban population (Population of India, 2020). Thus, the infectivity of COVID-19 is at a slower rate.

Another factor is related to the geographical area and food culture in India, which is related to immunity against infection. Ayurvedic literature and other Indian systems of medicine have emphasized upon the definitive healthful effects of Indian spices in augmenting immunity. Turmeric is one of the commonly used key ingredients of Indian food which contains curcumin (active compound polyphenol). Curcumin is known to have "antioxidant, anti-inflammatory, anti-bacterial and wound healing properties". Its potential application in the treatment of arthritis, cardiovascular and inflammatory bowel diseases, as well as cancers, is reported (Abdollahi *et al.*, 2018).

Some literature search revealed that there is a correlation between COVID-19 mortality and temperature. In India, isolated cases of COVID-19 was identified In the month of March. The temperature in India starts rising gradually from 35^{o}C to 47^{o}C during the period from March to May. Respiratory failure is the main reason for mortality in COVID 19. In low temperature, inhalation of cold air can lead to bronchial constriction, which may promote susceptibility to respiratory infection (Martens, 1998). The severity and morbidity of respiratory diseases are strongly associated with the decrease in temperature (Ghalhari and Mayvaneh, 2016). Thus the climatic condition during March to May in India may be one of the reasons for less mortality rate of COVID-19

Effective implementation of mitigation measures by the Government that is early, stringent, and prolonged lock down helped in averting the expected exponential community spread of COVID-19 (Global Data Healthcare, 2020).

The primary vaccination program in India includes Bacille Calmette-Guérin (BCG), Measles, Mumps, and Rubella (MMR) vaccines. These may serve as one of the potential preventive modality in control of COVID-19. The vaccines stimulate T Helper 1 cells (CD4+) to secrete different types of cytokines, mostly interferon-gamma, interleukin- 2 (IL-2), and IL-12. IL-2 provokes the maturation of the killer T cell and improves the cytotoxicity of natural killer cells. Thus, recognition and destruction of an infected viral cell are possible (Baskar *et al.*, 1998). The " Trained immunity" is the immunity acquired through the BCG and Some other primary vaccines, which induces epigenetic and metabolic alterations which improves the innate immune response to subsequent infection (Netea *et al.*, 2020). The BCG vaccine might therefore reduce viraemia after SARS-COV-2 exposure, with consequent less severe COVID-19 and more rapid recovery (Curtis *et al.*, 2020). Apart from BCG, MMR also induce innate immunity against other virus strains. Thus, it also helps to protect the individual in an emerging pandemic of COVID-19 (Lyu *et al.*, 2020).

Historically malaria is endemic in India, which is a vector born disease caused by Plasmodium falciparum. It has been a major cause of morbidity and mortality throughout human history (Basu and Sahi, 2017). Hydroxychloroquine (HCQ), and chloroquine (CQ) are the drug of choice for malaria. Apart from their use in malaria, HCQ and CQ have been shown to exhibit antiviral activity. They inhibit the receptor bindation and fusion of cell membrane, thus restrain the entry of SARS-COV-2 viruses into the cell (Schrezenmeier and Dörner, 2020). Moreover, the changes in pH essential for lysosomes and enzymatic activity also play a more significant role in hindering the replication of viruses. Thus, HCQ and CQ help to suppress the overactivation of the immune system, which is trigger by SARS-CoV-2 and further progression of the disease (Zhou *et al.*, 2020). Along these lines HCQ and CQ may acts as a game-changer in this COVID-19 pandemic (Cunningham *et al.*, 2020).

CONCLUSION

Considering all the factors mentioned above related to COVID 19, it may be hypothesized that there is less mortality rate in India as compared to the rest part of the world. All these factors to be studied in detail, which further may be used as therapeutics modalities to fight against the severity of COVID-19 from which we can save millions of life.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

Funding Support

The authors declare that they have no funding support for this study.

REFERENCES

Abdollahi, E., Momtazi, A. A., Johnston, T. P., Sahebkar, A. 2018. Therapeutic effects of curcumin in inflammatory and immune-mediated diseases: A nature-made jack-of-all-trades? *Journal of Cellu-*

lar Physiology, 233(2):830–848.

Baskar, Collins, Dorsey-Cooper, Pyle, Nagel, Dwyer, Dunston, Johnson, Kendig, Israel, Nalin, Adler 1998. Serum antibodies to HIV-1 are produced post-measles virus infection: evidence for cross-reactivity with HLA. *Clinical & Experimental Immunology*, 111(2):251–256.

Basu, S., Sahi, P. K. 2017. Malaria: An Update. *The Indian Journal of Pediatrics*, 84(7):521–528.

Cunningham, A. C., Goh, H. P., Koh, D. 2020. Treatment of COVID-19: old tricks for new challenges. *Critical Care*, 24(91).

Curtis, N., Sparrow, A., Ghebreyesus, T. A., Netea, M. G. 2020. Considering BCG vaccination to reduce the impact of COVID-19. *The Lancet*, 395(10236):1545–1546.

Fini, M. B. 2020. What dentists need to know about COVID-19. *Oral Oncology*, 105:104741–104741.

Ghalhari, G. F., Mayvaneh, F. 2016. Effect of Air Temperature and the Universal Thermal Climate Index on Respiratory Diseases Mortality in Mashhad. *Iran. Archives of Iranian Medicine*, 19(9):618–624.

Global Data Healthcare 2020. Despite the recent surge in the daily confirmed cases of Covid-19 in India, average case fatality rate is relatively low. [Accessed on 27 May 2020].

Lyu, J., Miao, T., Dong, J., Cao, R., Li, Y., Chen, Q. 2020. Reflection on lower rates of COVID-19 in children: Does childhood immunizations offer unexpected protection? *Medical Hypotheses*, 143:109842.

Martens, W. J. M. 1998. Climate change, thermal stress and mortality changes. *Social Science & Medicine*, 46(3):162–169.

Netea, M. G., Domínguez-Andrés, J., Barreiro, L. B., Chavakis, T., Divangahi, M., Fuchs, E., Joosten, L. A. B., van der Meer, J. W. M., Mhlanga, M. M., Mulder, W. J. M., Riksen, N. P., Schlitzer, A., Schultze, J. L., Benn, C. S., Sun, J. C., Xavier, R. J., Latz, E. 2020. Defining trained immunity and its role in health and disease. *Nature Reviews Immunology*, 20(6):375–388.

Population of India 2020. Ministry of Statistics and Programme Implementation: UN (World Population Prospects 2019). [Accessed on 17 May 2020].

Ray, A. 2020. COVID-19 fatality rate in India is one of the lowest in world: Health ministry. [Accessed on 26 May 2020].

Sarode, S. C., Sarode, G. S., Gondivkar, S., Gadbail, A., Gopalakrishnan, D., Patil, S. 2020. Oral submucous fibrosis and COVID-19: Perspective on comorbidity. *Oral Oncology*, 107:104811.

Schrezenmeier, E., Dörner, T. 2020. Mechanisms of action of hydroxychloroquine and chloroquine: implications for rheumatology. *Nature Reviews Rheumatology*, 16(3):155–166.

The Lancet 2020. India under COVID-19 lockdown. 395(10233). [Accessed on April 25, 2020].

Varshney, V. 2020. COVID-19: Do Indians have higher immunity to novel coronavirus. [Accessed on 09 April 2020].

Zhou, D., Dai, S.-M., Tong, Q. 2020. COVID-19: a recommendation to examine the effect of hydroxychloroquine in preventing infection and progression. *Journal of Antimicrobial Chemotherapy*, 75(7):1667–1670.