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Physiological Hazards and Advancement of COVID-19 in Patients as a Result of Habitual and Prolong Face Mask Usage: Potential Prevention

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ABSTRACT

Background: Since the first report of coronavirus disease widely known as COVID-19, in late December 2019; face masks (medical, surgical etc.) became one of the preventive/ common measures adopted, which in turn resulted to its habitual use. The habitual use of the masks portrayed potential physiological hazards as it is suggested to affect the human physiology adversely.
Content: This article highlighted consequences of habitual and prolonged face mask usage which includes; potential physiological hazards and advancement of COVID-19 in infected individuals that employ its use.
Conclusion: The article did not undermine the usefulness of surgical or medical mask as personal protective equipment worn to prevent transmission of airborne infections (COVID-19, etc.), but the article suggests avoidance of habitual and prolonged use of masks and possible ways to use it in order to prevent physiological hazards that result from its habitual use.

Keywords: COVID-19, face mask, physiological hazard, habitual use, frequent

INTRODUCTION

Prior to COVID-19 pandemic (since the early 1900s), surgical mask (medical face mask) was mainly a personal protective equipment worn by health professionals during medical procedures to prevent airborne infections (pathogens, microbes etc.) from transmitting from patients to treating personnel. It protects the nose and mouth of the wearer [1, 2].

Despite the prevention of infections by masks, in vivo experimental evidence supports the possible benefit of surgical mask in prevention of COVID-19 transmission [3]. Habitual use of surgical or medical masks increased rapidly as a result of the COVID-19 pandemic; this is because wearing of surgical masks became one of the most common measures employed to prevent escalation of COVID-19 as most countries in the globe made its use compulsory following the sudden outbreak of the virus [3, 4].

The usefulness of surgical mask cannot be overemphasized. Whether or not surgical mask is hazardous became a concern as result of its habitual or prolonged use by individuals in the world due to COVID-19 pandemic. Among other phenomenon of COVID-19, frequent usage of face masks may play adverse role in human physiology. Hence this article highlights the potential physiological hazards and advancement of COVID-19 in infected individuals in consequence of habitual usage of face masks, as well as its avoidance.

Socio-economical hazard of COVID-19 pandemic

The epicenter of the outbreak of COVID-19 in December 2019 is the city of Wuhan, the Hubei province of China where cases were reported and through the travellers from the country, the COVID-19 cases got to many other countries and

continued to spread across the world [5]. However, COVID-19 became a global pandemic [6].

Socio-economical hazard of COVID-19 advanced beyond increased death rate and number of those who are unable to work for a period of time [7] and became apparent; hence it interrupted production, as well as declined the Chinese economy. Global supply chains were also interrupted. Globally, companies depending on Chinese inputs experienced reduction in production. Transportation restrictions among countries further slowed global economic activities leading to panic among consumers and firms hence affected the consumption patterns and created market decline across the globe [6, 8]. The significant public health hazard of COVID-19 made WHO to declare public health emergency which mandated an international concern to coordinate international responses to the disease [7].

COVID-19 nodus stated above resulted from the activities of the virus on human physiology and the lockdown policies employed as a measure to prevent escalation of the virus. But this article elucidated COVID-19 nodus that resulted from the effects of frequent face mask (medical, surgical etc.) usage on human physiology.

Consequences of habitual and prolonged face masks usage

Despites the usefulness of surgical or medical masks [4] studies has shown potential hazards of frequent face masks usage especially on prolonged and habitual use [9]. Table 1 summarizes some potential physiological hazard of frequent face masks usage. Table 2 showed factors that suggest that habitual and prolonged use of facemask by COVID-19 patients enhances the progression of the disease.

Table 1: Potential physiological hazard of frequent face masks usage

Potential physiological hazards of masks	Basis of proof
Physiological hazard of prolonged use of N95 and surgical masks includes headaches, rash, acne, skin breakdown, and impaired cognition.	Rosner, 2020 [9]
Otorhinolaryngology department in Sitapur suggested that common symptoms of using facial masks include headache, nasal dryness, eye dryness and acne.	Shubhanshu and Singh, 2021 [10]
Surgical mask used after duration of 150 minutes showed an increased heart rate and a decrease in blood oxygen saturation of subjects.	Tornero-Aguilera and Clemente-Suárez, 2021[11]
Evaluation of the dermatologic effects of over time wearing of mask suggests that skin temperature, redness, hydration, and sebum secretion were changed significantly after 1 and 6 hours of wearing a mask. Thus habitual wearing of mask can change skin characteristics.	Park *et al.*, 2021 [12]
Wearing masks causes exhaled air to enter the eyes, leading to discomfort and redness of the eye.	Desai and Aronoff, 2020 [13]
Habitual face mask usage causes inflammation and injury to ear.	Gattani and Gattani, 2021 [14]
Surgical masks cause difficulty in breathing especially for COPD patients; hence, they are intolerable to wear as they worsen their breathlessness.	Kyung *et al.*, 2020 [15]; Martin *et al.*, 2020 [16]
Face mask increased facial discomfort, itching, heart rate, respiratory rate, end-tidal carbon dioxide etc. It decreased exercise and walking distance performance as well as oxygen saturation. It is also suggested to cause cardiopulmonary overload.	Dirol *et al.*, 2021[17]

Table 2: Factors suggesting that habitual and prolonged use of facemask by COVID-19 patients advances the progression of the disease.

Factors suggesting advancement of COVID-19 in patients using facemasks	Basis of proof
Surgical face mask causes exhaled air to enter the eyes resulting to an uncomfortable feeling which causes the urge to touch the eyes. Thus, if the hands are contaminated it can cause spread of the infection.	Desai and Aronoff, 2020 [13]
Facemasks causes fraction of previously expired carbon dioxide to be inspired. This may worsen the cases of COVID-19 in patients wearing masks; since they spread more contaminated air, the clinical conditions of patients may worsen as enhanced breathing with facemask causes the virus to be pushed into the lungs.	Kyung *et al.*, 2020 [15]; Martin *et al.*, 2020 [16]

Potential prevention of the consequences of habitual and prolong face mask usage

Several other studies are ongoing as it is a concern to scientist to evaluate and suggest better method of preventing physiological hazard in consequence of frequent facemask usage as well as preventing COVID-19. A study aimed at exploring possible preventions for face mask related skin reactions in Thailand,

suggested wearing a cloth mask in non-health care workers to decrease the risk of adverse skin reactions as a result of face mask [18]. Periodic removal of surgical mask when an individual is alone was also suggested to reduce potential hazard of wearing surgical mask [10].

CONCLUSION

Conclusively, despites the usefulness of surgical or medical face masks to prevent COVID-19 escalation; this study suggests that habitual and prolong use can cause hazards in human physiology and biology. Thus, habitual and prolonged use of masks should be avoided; periodic removal of masks when an individual is alone is advised in order to reduce its potential physiologic hazard.

Abbreviations

COVID-19: Corona Virus Disease -19
WHO: World Health Organization
COPD: Chronic Obstructive Pulmonary Disease

Declaration

Author contributions

Onwuka, Osah Martins is the principal developer of this manuscript. He is the author responsible for the article concept, design, and writing. He is also responsible for correspondence to the manuscript in its final form.

Conflict of Interest:

There is no conflict of interests

Ethical approval and consent to participate

Not applicable

Consent for publication

Not applicable

Availability of data and materials

Not applicable

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