

Prophylaxis Against COVID-19: A Possible Way of Effective Control Against COVID-19

Ahmad S¹, Khan HD² and Sarwar Z³

¹King Edward Medical University, Lahore, Pakistan

²Shalamar Medical & Dental College, Lahore, Pakistan

³Assistant Professor East Surgical Ward, Mayo Hospital, Lahore, King Edward Medical University, Lahore, Pakistan

*Corresponding author:

Shahzaib Ahmad,
King Edward Medical University,
Lahore, Pakistan,
E-mail: shahzaib.ahmad.kemu@edu.pk

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COVID-19; Effective; Prevention; Prophylaxis; Pre-exposure; Post-exposure

Abbreviations:

COVID-19: Coronavirus Disease of 2019;

SARS-CoV-2: Severe Acute Respiratory

Syndrome Virus 2

1. Abstract

COVID-19 emerged in the later part of 2019 is a public health emergency of international concern. Though definite treatment and vaccine against the Coronavirus are not available, yet COVID-19 prevention and prophylaxis are important to appease the pandemic burden. An effective prophylactic agent will prevent disease in high-risk groups, e.g., medical professionals managing COVID-19 patients.

2. Editorial

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) emerged as a deadly pandemic starting from China and reaching to every nook and corner in the world, affecting over 13 million people and causing over 500 thousand deaths worldwide. As compared with pandemics caused by the other coronaviruses (SARS and MERS), the case fatality rate is less, but the case reproduction number (Ro) is higher in the case of SARS-CoV-2 pandemic, i.e., it is more contagious than SARS and MERS [1]. Starting in the later part of 2019 till July 2020, it has spread to all continents of the world, affecting an enormous number of people. COVID-19 burdened healthcare systems adversely. The health department, being on the frontline against COVID-19 faced fierce blows; patient load, lack of expertise in epidemic control, updating guidelines, varying signs & symptoms, lack of treatment & vaccination, and evolving guidelines led to a surge in COVID-19 cases resulting in the health system “break down.” Emergency rooms have been continuously dealing with critically ill patients, and healthcare professionals from all fields have been employed for

medical emergencies [2]. Inefficient epidemic control systems, inadequate availability of Personal Protective Equipment (PPE) for healthcare teams, and medical equipment, e.g., ventilators, led to worsening of the situation. The development of curative and preventive remedies against SARS-CoV-2 holds an important ground in the COVID pandemic. Clinical trials using different drugs like rimdesivir, chloroquine, hydroxychloroquine, ritonavir, lopinavir, IFN- α , ivermectin, tocilizumab, and many more, are being carried out in quest of an effective treatment against SARS-CoV-2. Definite drug and development of an effective vaccine against the virus are the prime objectives of healthcare strategy makers and pharmaceutical industries [3]. Recently, the researchers paid heed to find a prophylactic drug against SARS-CoV-2. Preexposure prophylaxis is vital in hampering the COVID-19 outbreak, especially in populations and groups that are particularly vulnerable to COVID-19 infection, i.e., physicians, paramedical staff, hospital sanitary workers, old age groups, and individuals with chronic illnesses. 98% of the individuals develop a mild form of the disease, and only 2% of the individuals develop severe respiratory and systematic symptoms. Healthcare staff in COVID-19 emergency rooms managing and treating COVID-19 patients are frequently exposed to the virus. Several healthcare workers have developed disease symptoms following exposure to the virus in clinical wards. It also imposes a threat to their families that may get the virus through carrier transmission or asymptomatic COVID-19 transmission. So far, more than 90,000 healthcare workers have been infected with SARS-CoV-2, causing more than 600 deaths in the US and 100 deaths in the UK [4-6]. This further brings

attention to the development of a prophylactic agent to protect frontline healthcare providers and their families.

Various drugs have been tested in several clinical trials. So far, twelve clinical trials have been registered on the United States National Institutes of Health-hosted ClinicalTrials.gov (www.clinicaltrials.gov), the Australian New Zealand Clinical Trials Registry (www.anzctr.org.au), and the WHO International Clinical Trials Registry Platform (www.who.int/ictrp). Out of 12 clinical trials, 6 clinical trials (50%) investigated pre-exposure prophylaxis (PrEP), and 6 (50%) trials investigated post-exposure prophylaxis (PEP). Four out of six (66.67%) of the pre-exposure (PrEP) clinical trials use anti-malarial drugs hydroxychloroquine or chloroquine as the interventional drug. In one of the PrEP trials, recombinant human interferon- α 1b and thymosin- α 1 were used as a prophylactic agent while other PrEP clinical trials used the BCG vaccine as the prophylactic strategy. The target sample size in each trial is different; it ranges from 2944 to 55,000, with an average of 18,185. These are registered as NCT04303507, NCT04334928, NCT04341441, NCT0433373, NCT04327206, and NCT04320238. In post-exposure (PEP) clinical trials, five out of six (83.33%) used hydroxychloroquine while the other one used lopinavir-ritonavir. The target population ranged from 1220 to 3040, with an average of 2310. The registration numbers are NCT04308668, NCT04318444, NCT04328961, NCT04342156, NCT04304053, and NCT04321174 [7]. Healthcare Worker Exposure Response & Outcomes of Hydroxychloroquine Trial (HERO-HCQ) is a nationwide randomized clinical trial among healthcare workers aimed to establish the prophylactic role of hydroxychloroquine. Another protective agent under consideration is “carefully dosed iodine nasal spray and gargles.” Clinical trials of iodine have been started at George Washington University and Louisiana State University. Likewise, numerous trials with other agents are being conducted over the globe [8]. Kaur et al. negated the evidence to use hydroxychloroquine as a pre-exposure (PrEP) prophylactic agent [9]. However, post-exposure prophylaxis with hydroxychloroquine provided effective protection against adverse COVID symptoms in 211 subjects [10].

Thus, the importance of prophylaxis is immense, as it will appease the anxiety from healthcare facilities as COVID-19 causes psychological symptoms, i.e., fear, anxiety, stress, and depression, among medical teams and the general public. The protective agents against COVID-19 create a “sense of security” against the virus among the masses. Thus, they will protect against the psychological implications of COVID-19. Prophylactic drug concentration in the body protects against pathology caused by SARS-CoV-2, thus protecting from adverse effects on body systems. However, the success of clinical drug trials depends on the participation and volunteer force. Hence, COVID-19 prophylaxis is an area of extensive research. Researchers throughout the world are engaged to find out the pharmaceutical agents for adequate pre-exposure protection against SARS-CoV-2 still there aren't much success in this area so far.

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