

ORIGINAL ARTICLE

Assessing Knowledge, Attitude, and Practices towards Ivermectin Pre-exposure Prophylaxis for COVID-19 among Health Care Workers

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Abstract

Background: Health care workers (HCWs) are more likely to be at high risk of SARS-CoV-2 infection due to their direct and/or indirect participation in treatment facilities. Here, we aimed to evaluate the knowledge, attitude, and practices of ivermectin pre-exposure prophylaxis (PEP) in HCWs. **Materials and Methods:** In this observational study HCWs who were directly/indirectly involved in the medication of COVID-19 patients were selected. The study questionnaire included demographic data; knowledge, attitudes, practices, and associated adverse drug reactions (ADR) after using ivermectin as pre-exposure prophylaxis in COVID-19. **Results:** The mean age of the selected 306 participants was 34.41 {±standard deviation 4.08}. 66.66% of the participants were men. 15.69% of individuals had co-morbidities. HCWs were about COVID-19, and 94.12% of people know the role of ivermectin as PEP. Additionally, 180 participants (58.82%) realized that ivermectin can cause adverse drug reactions (ADRs). 70.59% of the study-participants admitted that ivermectin has a protective effect on COVID-19, while 62.75% of the participants believed that the PEP benefits of using ivermectin outweigh the risks. 57.37% (n = 210) of HCW used ivermectin and completed the recommended medication process. Eighteen participants (8.57%) experienced adverse reactions and reported to the ADR monitoring center. **Conclusion:** 70.59% of the studied participants agreed that ivermectin has a protective effect on COVID-19, and 57.37% of the participants have taken ivermectin as PEP. However, 8.57% of the individuals reported ADR, but none of the participants were severe enough to discontinue the drug.

Keywords

Adverse drug reaction; Ivermectin; Infection; Pandemic; SARS-CoV-2; RT-PCR; Pharmaceutical Preparations

Introduction

We are in the race with a novel coronavirus for survival. In the second wave of COVID-19 world is crying. The ongoing COVID-19 pandemic is the most destructive and difficult to control crisis ever experienced by the world. Millions of lives have been endangered, and many more people are still fighting from this critical situation with this virus, lurking in the atmosphere (1). However, there is no definite treatment available for COVID-19 till date. Several

vaccines and medications are being developed, but are not sufficient to stop the pandemic. Although the search for an ideal medication and vaccine is still in progress, it is important for the scientific fraternity and doctors to find alternative sources of prevention using drugs that are already widely used (2).

Frontline health care workers (HCWs) viz doctors, residents, nurses, pharmacists, and other personnel have direct and/or indirect contact to SARS-CoV-2 infected

patients. Because of repeated contact, they have a very high chance of being infected. Globally, medical staff managing COVID-19 patients are being infected, with an estimated range of 4.4%-20% (3-4). In this case, chemoprevention may reduce the infection rate of HCWs (2,5,6). In pre-exposure prophylaxis (PEP), drugs/therapies can prevent this disease.

Ivermectin is a drug with a wide range of biological activities and has been used to treat human parasitic infections for many years. Some researches show that ivermectin has antiviral activity in-vitro towards the SARS-CoV-2 virus (7). It is considered as a possible target drug for SARS-CoV-2 and is being studied in many clinical trials. Ivermectin may be a probable molecule which can be used as a prophylaxis and healing of people infected with SARS-CoV-2. A group of senior medical practitioners from India met on 19th July 2020 under the aegis of the Academy of Advanced Medical Education for the management of COVID-19 and concluded that ivermectin can be a potential drug for prophylaxis and treatment of COVID-19 patients (8). The group had published a "white paper on ivermectin as a potential therapy for COVID-19" which was widely accepted and used in COVID-19 treatment facility. It was assumed that if health care professionals took ivermectin before exposure to the SARS-CoV-2 virus then their chances of getting an infection will be lowered and they can be protected from COVID-19.

Aims & Objectives

1. To assess the demographic profile of health care professionals during COVID-19 pandemic.
2. To evaluate their knowledge, attitude & practices towards ivermectin pre-exposure prophylaxis in COVID-19.

Material & Methods

It was questionnaire based observational study. We have purposively selected HCWs from four government and three private hospital of Lucknow, Uttar Pradesh, India which were involved in COVID-19 management. HCWs consisted of doctors, residents, research students, and other hospital staff (nurse, pharmacist, etc.) who were directly and/or indirectly involved in the COVID-19 hospitals were enrolled. The age group of participants was 21 to 60 years. We have approached via email to many participants. However, 339 HCWs were responded. Out of 339 participants, 33 were incorrectly and/or incompletely filled the study questionnaire. Hence, we had selected 306 HCWs.

The study questionnaire consisted of demographic data such as age, gender, institution, health profession, co-morbidity, and medication obtained from the health care workers. Knowledge, attitude, and practices of ivermectin pre-exposure prophylaxis, adverse drug reaction (ADR), and its reporting were also determined. Questionnaire was developed and validated with the help of experts in the field of respiratory medicine, and pharmacology. The

study protocol was approved by the Institutional Ethics Committee of the institution.

Here, we had used study questionnaire in Google form to collect data. Google form was sent to the participants via email as at the surge of COVID-19 pandemic one-to-one meeting was avoided and was sometimes not possible/safe/suitable. Participants had answered questions by clicking the corresponding box or input content. On the first page of the questionnaire, all participants were informed of the confidentiality and anonymity of their answers. At the end all the entries were checked by the medical expert and completely filled questionnaire were selected to derive the results. Collected data were analysed by the SPSS software package (version 5, IBM, Germany) to get the significant results. Data were presented as mean \pm standard deviation (SD), number and percentage (%).

Results

Demographic profile of Health Care Workers: The demographic profile of HCWs was depicted in [Table 1]. The age of 306 HCWs was 34.41 ± 4.08 (mean \pm standard deviation). HCWs were categorized into age groups 21-30 (n=102), 31-40 (n=132), 41-50 (n=60), and 51-60 (n=12). Total number of male participants (n=204, 66.7%) was more than females (n=102, 33.3 %). Out of 306 HCWs, 120 doctors, 72 residents, 48 research students, and 42 hospital staff were enrolled [Figure 1]. 78.4% participants were from government hospitals while the rest were from private hospitals and/or clinics. A total of 15.7% participants (n=48) had associated with co-morbidities like hypertension, diabetes, high blood pressure, hypothyroidism, and asthma, etc. [Figure 2].

Assessment of knowledge: All HCWs have knowledge of COVID-19. When asked about their treatment options, 35.3% of the participants replied that so far, there is no treatment for COVID-19. 98% of the subjects had heard of ivermectin, and 94% of the subjects knew the role of ivermectin in pre-exposure prevention in COVID-19. 96% of HCW answered that ivermectin chemoprevention is in the experimental stage [Table 2].

Assessment of attitude: 270 (88.24%) health care workers agreed that ivermectin should be used for pre-exposure prophylaxis (PEP) of COVID-19, while 70% of participants believed that ivermectin could prevent COVID-19. 41.18% of HCP believe that because the drug is in the experimental stage, it will cause a false sense of security. It was asked to subjects that what they think about the benefit: risk ratio of using ivermectin (more benefit; more risk; not sure); 62.75% answered 'more benefit', more risk (3.92%), and 'not sure' ticked by 33.33% participants [Figure 3]. In addition to this, 180 participants (58.82%) realized that ivermectin can cause adverse drug reaction [Table 3].

Assessment of practice: The assessment of practice was presented in [Table 4]. 57.37% (n = 210) of health workers

have used ivermectin for pre-exposure prevention of COVID-19. Among the 210 participants, 198 (94.28%) took the medication in time and completed the course of medication. 91.42% (n = 192) of HCP did not report any ADR after using ivermectin. Eighteen participants (8.57%) experienced ADR while using ivermectin. All these 18 participants have reported ADR to the Adverse Monitoring Center (AMC) or the National Coordinating Center of India-Pharmacovigilance Program (PvPI). None of the participants had to stop the PEP ivermectin regimen due to ADR. The main adverse reactions reported by participants were diarrhoea, abdominal pain, nausea, and loss of appetite [Figure 4].

Discussion

In the present study, we assessed the knowledge, attitude, and practice of HCWs especially doctors, resident doctors, research students, hospital staff (nurse, pharmacist, etc) towards ivermectin prophylaxis in COVID-19. Our data shows that HCPs have basic knowledge of ivermectin prophylaxis. Their attitude towards the usage of ivermectin was also satisfactory. 57.37% (n=210) of health workers have used ivermectin as pre-exposure prophylaxis from COVID-19. Moreover, 91.42% (n = 192) of HCP did not report any ADR after using ivermectin. Eighteen participants (8.57%) experienced ADR while using ivermectin. The major adverse reactions reported by participants were diarrhea, abdominal pain, nausea, and loss of appetite. Collectively, results of present study are in favor of using ivermectin as prophylaxis in HCWs to diminish the COVID-19 infection.

Caly L et al. demonstrated that within 48 hours of a single dose of 5µM ivermectin, it can inhibit SARS-CoV-2 in vitro, reducing viral RNA by 99.98% [9]. They believe that ivermectin can play a role by inhibiting IMPα/β1 mediated nuclear import of viral proteins (7). An observational study was performed to ascertain the ivermectin as PEP for COVID-19 among health care providers in the Dhaka and authors suggested that ivermectin could be used as a prophylaxis in COVID-19 (1). In addition to this, a randomized control trial study was performed to evaluate the safety and efficacy of ivermectin, hydroxychloroquine, and vitamin C as a chemoprophylaxis in COVID-19 (9). Authors had concluded that two-dose ivermectin (300µg/kg with a gap of 72 hours) reduced 73% of COVID-19 infection in HCPs for the following month. Also, stated that types of households, COVID-19 duty, ivermectin single-dose, vitamin C, hydroxychloroquine were not linked with SARS-CoV-2 infection. A randomized clinical trial was conducted to investigate the ivermectin prophylaxis among HCWs in Egypt (10). Researchers had concluded that ivermectin was beneficial to avoid SARS-CoV-2 infection without serious adverse effects and/or mortality in health workers. Contrary to the current work on the importance of ivermectin in the eradication of COVID-19, as previous studies showing the in vivo

therapeutic efficacy of ivermectin (11); although in vitro studies have proved that the drug has a broad range of antiviral effects, Momekova G refused to consider that the drug has a broader range of antiviral effects (12). As COVID-19 cases are continuously increasing in the whole world, it is difficult to estimate the actual number of infected people due to asymptomatic, no, and/or mild symptoms. In that case, it is essential to use a drug/therapy to overcome COVID-19 infection. Ivermectin is a safe, cheap, widely available drug, and proven antiviral activity may be used as prophylaxis in COVID-19.

Conclusion

Our data shows that 70.59% of the HCWs agreed that ivermectin has a protective effect on COVID-19, and 57.37% of the subjects have taken ivermectin as PEP. However, 8.57% of the individuals reported ADR, but none of the participants were severe enough to discontinue the drug. In addition to this, further research on large-scale clinical trials of ivermectin prophylaxis is also necessary.

Limitation of the study

In the present study data was collected from limited participants. Here, HCWs have not given ivermectin from single company, as it was questionnaire based study. Hence, further studies like randomized control trials with larger sample size are needed.

Relevance of the study

Ideal dose of ivermectin may be used to prevent SARS-CoV-2 infection in frontline healthcare workers in COVID-19.

Authors Contribution

All authors have contributed equally.

Acknowledgement

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Tables

TABLE 1 DEMOGRAPHIC PROFILE OF STUDIED POPULATION

S.No.	Characteristics	Subjects (n= 306)
1.	Age (mean±SD)	34.41±4.08
2.	Age group (Years) 21-30 31-40 41-50 51-60	102 (33.3) 132 (43.1) 60 (19.6) 12 (3.9)
3.	Gender (n, %) Male Female	204(66.7) 102(33.3)
4.	Health workers belongs to Government hospital Private hospital/clinic	240(78.4) 66(21.6)
5.	Co-morbidity (n, %) Yes No	48 (15.7) 258(84.3)

TABLE 2 ASSESSMENT OF KNOWLEDGE OF HEALTHCARE PROFESSIONALS TOWARDS COVID-19, AND IVERMECTIN PROPHYLAXIS

S.No.	Particulars	Yes (n,%)	No (n,%)
1	Do you know about COVID-19?	306 (100)	0
2	Is treatment of COVID-19 available or not available?	198(64.7)	108(35.3)
3	Have you heard about ivermectin?	300(98)	6(2)
4	Do you know about its role in pre-exposure prophylaxis for COVID-19?	288(94.1)	18(5.9)
5	Do you know use of ivermectin in COVID-19 is in experimental phase?	294(96.1)	24(7.9)

TABLE 3 ASSESSMENT OF ATTITUDE TOWARDS IVERMECTIN PRE-EXPOSURE PROPHYLAXIS AMONG EXPOSED HEALTHGIVING WORKERS FROM COVID-19

S. No.	Particulars	Yes (n,%)	No (n,%)
1	Do you think that ivermectin should be used for pre-exposure prophylaxis of COVID-19?	270(88.2)	36(11.8)
2	Do you think that it can cause adverse drug reactions?	180(58.8)	126(41.2)
3	Do you think it will protect against COVID-19?	216(70.6)	90(29.4)
4	Do you think it will lead to false sense of security, as the drug is in the experimental phase?	180(58.8)	126(58.8)

TABLE 4 ASSESSMENT OF PRACTICE OF IVERMECTIN PRE-EXPOSURE PROPHYLAXIS AND ITS CONSEQUENCES ON HEALTH WORKERS

S. No.	Particulars	Yes (n, %)	No (n, %)
1	Have you used ivermectin as pre-exposure prophylaxis?	210(57.4)	96(31.4)
2	If yes, have you taken all the doses in the time?	198(94.3)	12(5.7)
3	Have you completed the drug course?	198(94.3)	12(5.7)
4	Have you experienced any adverse drug reactions (ADRs) after using it?	18(8.6)	192 (91.4)
6	Have you reported the ADRs to Adverse Monitoring Centre, or National Coordination Centre- Pharmacovigilance Programme of India.	18(100)	-

Figures

FIGURE 1 HEALTH CARE WORKERS PROFESSION

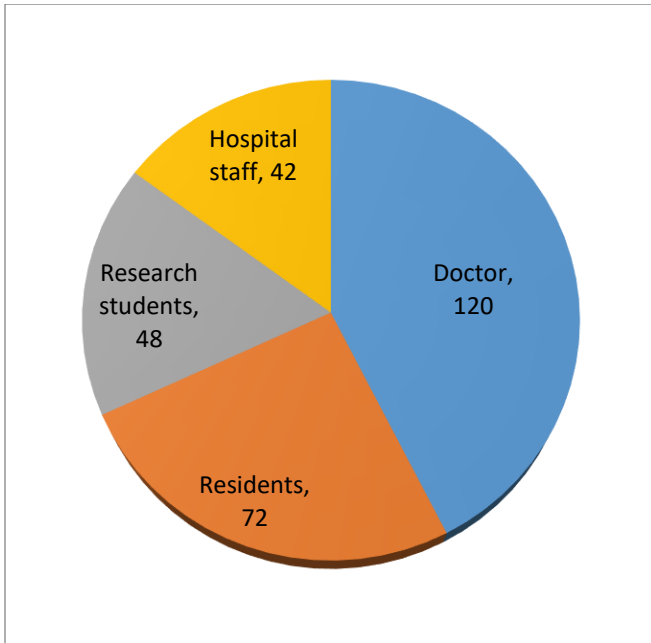


FIGURE 2 CO-MORBIDITIES OF HEALTH CARE WORKERS

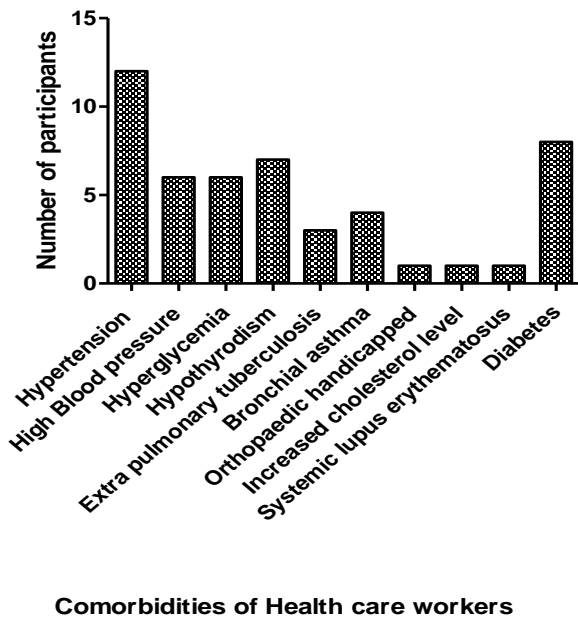


FIGURE 3 WHAT DO YOU THINK ABOUT THE BENEFIT: RISK RATIO OF USING IT? (MORE BENEFIT; MORE RISK; NOT SURE)

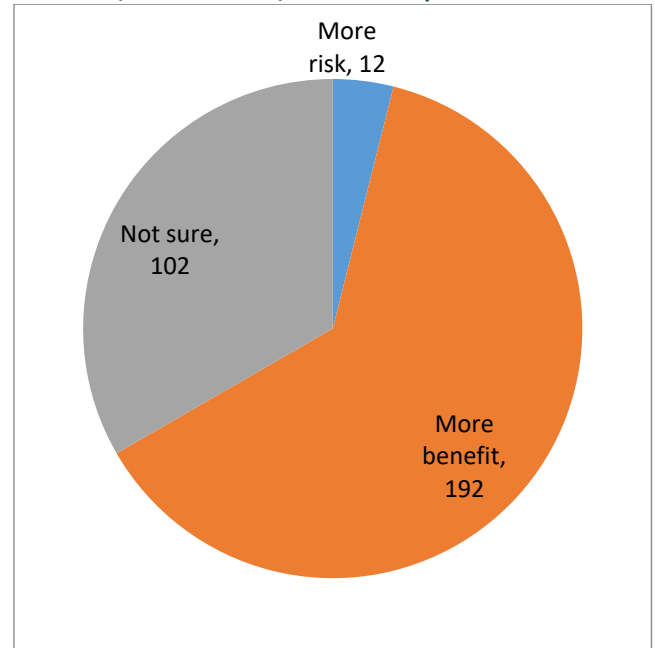


FIGURE 4 ADVERSE DRUG REACTIONS (ADRS) EXPERIENCED BY HCWS

