(International Print/Online Journal)

SJIF IMPACT FACTOR: 5.565
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume 4, Issue 4, Page No: 821-827
July-August 2021

IJMSCR

Use of "AyurCoro-3" as a prophylactic drug in frontline healthcare workers involved in treating COVID-19 patients: A pilot study

[1]Dr. Ajay Prabhakar Sankhe, [2]Dr. Nanasaheb Somnath Memane, [3]Dr.Vijaykumar P Gawali, [4]Dr. Sonal Nanasaheb Memane, [5]Mr. Mayur Nimba Bagul, [6]Dr. Ganesh Ramakrishnan

[1]Director, [2]Head - Ayurveda Dept, [3]Head- Clinical Research, [4]Consultant Ayurveda, [5]Senior Research Coordinator, [6]Professor

[1-5]Bhaktivedanta Hospital and Research Institute

[6]Computer Science and Engineering Indian Institute of technology, Bombay, India

***Corresponding Author:**
Dr. Ajay Sankhe

Bhaktivedanta Hospital and Research Institute, Srishti Sector -1, Thane (401107) , Maharashtra,India

Type of Publication: Original Research Paper
Conflicts of Interest: Nil

Abstract

Background: Effective prophylactic measures for COVID-19 are limited and not evidence-based. We carried out a study evaluating the use of 'AyurCoro-3 is a formulation of ingredients *Gomutra* (bos indicus distilled ark), hot water, turmeric (haridra churna), *Turati churna* (potassium Alum), candy sugar (*khadisakhar*), *Bos indicus* milk with two teaspoons of *Go Ghrut* (Ghee), as a prophylactic drug in frontline health care workers (HCWs) involved in treating COVID-19 patients.

Methods: An interventional study was carried out in HCWs working for eight hours a day for at least five days a week in the dedicated COVID-19 hospitals. Three doses of 'AyurCoro-3' in a day, with monthly intervals were administered for 3 consecutive months. COVID-19 free survival time, adverse events, duration of COVID-19 symptoms (and duration), and mortality were the intended outcome measures. COVID-19 infection was monitored by reverse transcriptase polymerase chain reaction (RT-PCR) tests.

Results:

We recruited 120 HCWs in the study. None of them developed any symptoms/signs of COVID-19 infections or showed positive RT-PCR test during the four-month study duration.

Conclusion:

The Ayurvedic medicine 'AyurCoro-3' was effective and safe when used as prophylactic drugs in preventing COVID-19 infections amongst the high risk HCWs.

Keywords: Coronavirus infections, COVID-19, Ayurveda, Complementary and Alternative Medicine, prophylaxis

INTRODUCTION

Background:

COVID-19 pandemic has shaken the world and is continuing to take tolls of life. Healthcare workers (HCWs) are under tremendous pressure due to burden of the cases as well as an increased risk of infection, particularly the frontline group. World Health Organization's estimates reveal that 22,073 healthcare professionals were infected with COVID-19 in 52 nations [1]. A recent study amongst the HCWs revealed a rate of COVID-19 infection in around 5.62% [2]. The authors observed a high risk amongst female HCWs (55%), and nursing professionals were at increased risk; and those in the emergency department contracted the infection significantly

more. Additionally, a risk of COVID-19 infection exists for patients from the infected HCWs; however, only one amongst 226 patients has been reported to develop COVID-19 infection [3]. Apart from developing COVID-19 related symptoms, one-fifth of the HCWs involved in treating COVID-19 patients have been found to be positive for COVID-19 antibodies [4].

Despite intensive efforts, until now hardly there is/any approved drug for preventing COVID-19 infections particularly for high-risk categories such as HCWs. Initially, hydroxychloroquine was proposed as an effective prophylactic drug. However, high-quality randomized clinical trial revealed an incidence of COVID-19 to an extent of 0.27 events/person-year with once a week, and 0.28 events/person-year with twice a week hydroxychloroquine compared to 0.38 events/person-year with placebo; thus refuting its prophylactic effect [5]. A similar study from the European country also concluded the same; 23.19% (16/69) versus 15.55% (65/418) by reverse real-time PCR and 28.33% (17/60) versus 15.35% (62/404) by serology [6]. Additionally, concerns regarding the risk of cardiotoxicity with hydroxychloroquine when used as long-term prophylactic drug have been put forth by the Infectious Disease Society of America [7]. A recent study evaluating ivermectin as a prophylactic drug revealed that two doses reduced the risk of infection to an extent of 73% [8]. However, there is no consensus regarding any of the allopathic drugs as an effective prophylactic drug for COVID-19 in the high-risk category.

Ayurveda indigenous system of medicine with unbroken clinical practice dating back to thousands of years, classifies an individual based on *tridoshas (3 types of characteristics of discases)*, namely *vata*, *pitta* and *kapha*. *Vata* is related to motion, *pitta* to metabolism, and *kapha* to lubrication [9]. Imbalance of these three *doshas* reduces immunity. Ayurveda has been shown to successfully help in prophylaxis COVID-19 infections [10, 11]. In the Ayurveda text, various natural ingredients have been proposed to have antimicrobial properties. The ghee from *Bos Indicus* (cow) has been shown to possess anti-toxic and immune boosting properties [12]. Similarly, cow's milk enhances the tissue repair and boosts the immunity [13]. Potassium alum is a wound healer and possesses a local pungent action on the throat with anti-microbial property [14]. Rock candy reduces throat dryness and targets in treating all the three *doshas*. We formulated 'AyurCoro-3', containing a combination of cow (*Bos Indicus*) ark, turmeric (Curcumin), potassium alum, rock candy sugar, cow's milk, and ghee, based on the Ayurvedic texts and literature. We envisaged the present study to evaluate the use of AyurCoro-3 in preventing COVID-19 infections amongst the high-risk frontline HCWs.

Methods:

Study ethics and design:

The study was initiated after obtaining approval from the Institutional Ethics Committee and approval from the Ministry of Health (EC/NEW/INST/2019/245). The study was a prospective, interventional study carried out after obtaining written informed consent from the study participants. The study was carried out in the hospitals dedicated for treating COVID-19 patients approved by Government of India, between October 2020 and April 2021. We adhered to the latest update of Declaration of Helsinki guidelines.

Study participants:

Adult (> 18 years) HCWs working in the COVID-19 wards with an exposure to the patients confirmed with COVID-19 as per the reverse transcriptase polymerase chain reaction (RT-PCR) were recruited. The HCWs should be taking care of these patients for at least 8 hours per day for five days in a week for a minimum period of five months. Those with prior COVID-19 infections, and pregnant/breast feeding were excluded.

Study intervention:

AyurCoro-3, the Ayurveda intervention, was administered to the study participants as follows:

- Bos indicus distilled ark 10 ml and turmeric (haridra churna) 500 mg in 200ml of hot water was used for gargling the throat twice a day (first gargle one hour prior to lunch around 12 PM and second was around 9 PM).
- *Turati churna* (potassium Alum) with candy sugar (*khadisakhar*) in half a glass of warm water mixed with cow ark was administered orally (10 ml). The first dose of this intervention was started one hour post lunch, the second dose was administered two hours post first dose, and the third dose after two hours following the second dose.

Volume 4, Issue 4; July-August 2021; Page No 821-827

- One glass (200 ml) of pure *Bos indicus* milk with two teaspoons of *Go Ghrut* (Ghee) was administered post one hour of the third oral dose.

Outcomes:

Primary:

COVID-19 free survival time as confirmed either by the presence of symptoms as defined by the US council for State and Territorial Epidemiologist, or by RT-PCR test during routine checkup [15].

Secondary:

- Adverse events.
- Duration of COVID-19 symptoms.
- Duration of hospitalization attributed to COVID-19 infections.
- All-cause mortality.

Study procedure:

Eligible participants were recruited after their consent. The details on their demographic characteristics, and their duration of work in the COVID-19 wards were collected at baseline. 'Ayurcoro-3' was administered once a month for three consecutive months under direct supervision of the principal investigator. Every time, the mixture was prepared fresh before administration. The above-mentioned outcomes were evaluated at baseline, days 15, 30, 45, 60, 75, 90, 105, and 120. Complete details of the procedures carried out during this study are mentioned in Table 1.

Statistical analysis:

With a power of 80% and type 1 error rate of 5%, a clinically significant difference of 10% and 10% lost to follow-up, 120 patients was the estimated sample size. Numerical data was evaluated for normal distribution using Kolmogorov-Smirnov test and accordingly either parametric or non-parametric test was used. Statistical analyses were done using SPSS version 20. A p-value $\leq$ 0.05 was considered significant.

Results:

Demographic characteristics:

One-hundred and forty-four health care workers were screened of which 24 were excluded. A summary of demographic characteristics of the study participants are represented in Table 2.

Outcomes:

None of the study participants developed any symptoms related to COVID-19/were positive for RT-PCR test for COVID-19. However, only few study participants have reported mild adverse events as represented in Table 3 and none of the study participants developed any serious adverse events.

Discussion:

The present study was carried out to evaluate the efficacy of 'Ayurcoro-3' as a prophylactic drug in frontline HCWs working in the COVID-19 wards. We observed that none of our participants developed either COVID-19 related symptoms/turned positive for RT-PCR test. The Ayurvedic medicine was well tolerated with few minor adverse events.

COVID-19 infections amongst HCWs pose significant concerns as the strain on the requirement of frontline HCWs is the highest ever reported. Frontline HCWs are at the highest risk of infections due to their inevitable close contact with the infected patients during examination and administering treatment [16]. Increased stress amongst nursing HCWs who are providing care to coronavirus patients has been reported with around 12% reporting improper sleep duration, and 16% poor quality of sleep [17]. A recent study from the same population amongst 3711 HCWs revealed 11% prevalence rate and 1% mortality [18]. Frontline HCWs due to repeated exposure to COVID-19 patients, long working hours, stress, and fatigue are at increased risk of contracting the coronavirus. Certain categories of HCWs are at higher risk; a study from otorhinolaryngologist revealed that 75/274 (27%) developed COVID-19 infections [19]. Taking appropriate prophylactic measures is crucial in mitigating the risk of COVID-19 infections. Although guidelines recommend hand washing as one of the vital measures, increased frequency in the HCWs predispose them to hand dermatitis [20]. A recent estimate revealed an extent of acute hand dermatitis in 90.4% across all HCWs and primarily due to increased use of hand sanitizers [21]. Skin dryness, and skin flaking are the other commonly reported side effects due to overzealous use of alcohol-containing hand sanitizers [22]. Quarantine of HCWs with preliminary/full blown COVID-19 symptoms is

Volume 4, Issue 4; July-August 2021; Page No 821-827

another preventive measure recommended by all the guidelines. However, a study reported that nearly 57% of frontline HCWs who developed coronavirus infection were asymptomatic [23]. Hence, it is preferable to continue taking prophylactic drugs that are effective and safe for high risk HCWs. Hydroxychloroquine and ivermectin have been proposed to be useful prophylactic drugs; however, their efficacy and safety are still debatable when taken for long term. We observed that our Ayurvedic medicine is highly effective and safe when used as prophylaxis. However, pre-clinical studies exploring the molecular basis of its therapeutic effect in coronavirus infections are the need of the hour.

The strength of the present study is that the ingredients used in the Ayurvedic mixture are easily available throughout the world unlike the allopathic drugs where scarcity of the hypothesized drugs (hydroxychloroquine and ivermectin) is a well-known problem. However, the study is limited in not having a control group. Additionally, we did not control for other concomitant prophylactic measures such as handwashing and use of personal protective equipment amongst the study participants.

Conclusion:

Complementary and alternative systems of medicine hold great promise in containing the COVID-19 pandemic. The present pilot study has confirmed the therapeutic benefits of Ayurvedic combination medicine. We intend to confirm the therapeutic benefit in a future randomized clinical trial.

Funding:

The funder of the study had no role in the study design, data collection, data analysis, data interpretation or writing of the report. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit for publication.

Authors' contributions:

Items	First author	Second author	Third author	Fourth author	Fifth author	Sixth author
Conception of the idea	✔	✔				
Funding acquisition						
Data collection						✔
Data curation and analysis						✔
Data interpretation	✔	✔	✔	✔	✔	
Writing the first draft of the manuscript	✔	✔	✔			
Revisions and agreement on the final draft	✔	✔	✔	✔	✔	✔

Acknowledgements:

Mr. Umakant Gaikwad (Director of Sarveshwar Seva Sahkar Sanstha), Dr. Sivaprasad Gourabathini, and Dr Rishikesh Karpe, Mr Pravin Muley

Volume 4, Issue 4; July-August 2021; Page No 821-827

Table 1. Details of study procedure.

S. No.	Procedure	1st Study dose	Follow-up	2nd Study dose	Follow-up	3rd Study dose	Follow-up	Follow up-1	Follow up-2	Follow up-3
		Day -1	Day 15	Day 30	Day 45	Day 60	Day 75	Day 90	Day 105	Day 120
1	Consent	X								
2	Medical history	X								
3	Clinical examination	X		X		X		X	X	X
4	Assessment of eligibility criteria[1]	X								
5	Vital signs and demography[2,3]	X								
6	Study medication administration[4]	X		X		X				
7	AE recording[5]	X	X	X	X	X	X	X	X	X
8	Comorbid conditions	X								
9	Concomitant medicines	X								
10	Compliance to medication	X		X		X				

Abbreviations: AE= Adverse Event.

1 Eligibility criteria was confirmed at baseline visit after informed consent procedure.

2 Vital signs included pulse rate, blood pressure, and arterial saturation.

3 Demography features captured in the case record form included age, gender.

4 AyurCoro-3 medication compliance sheet was maintained to assess compliance with the study medicine.

5 Adverse events (AE) were defined as any new symptoms or worsening of pre-existing symptoms and were followed until complete resolution of symptoms.

Table 2. Demographic characteristics of the study population.

Variables	N=120
Age (years)[α]	36 (8.4)
Sex (male)	59 (49.2)
Hypertension	5 (4.16)
Diabetes mellitus	4 (3.33)

Volume 4, Issue 4; July-August 2021; Page No 821-827

α – represented in mean (SD). All others are represented in n (%).

Table 3. Details of adverse events reported amongst the study participants.

Adverse event	First dose	Second dose	Third dose	Follow-up Visit	Follow-up Visit
	Day 1	Day 30	Day 60	Day 90	Day 120
Nausea	3	2	1	0	0
Acidity	1	1	0	0	0
Loss of appetite	1	0	0	0	0
Headache	1	0	0	0	0

References:

1. World Health Organization. Coronavirus disease 2019 (COVID-19) situation report – 82. 2020. [Accessed on: 3 July 2021]. Available at: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200411-sitrep-82-covid-19.pdf?sfvrsn=74a5d15_2.
2. Sabetian G, Moghadami M, Hashemizadeh Fard Haghighi L, et al. COVID-19 infection among healthcare workers: a cross-sectional study in southwest Iran. Virol J 2021; 18: 58. https://doi.org/10.1186/s12985-021-01532-0.
3. Baker MA, Fiumara K, Rhee C, Williams SA, Tucker R, Wickner P, Resnick A, Klompas M; CDC Prevention Epicenters Program. Low risk of COVID-19 among patients exposed to infected healthcare workers. Clin Infect Dis. 2020 Aug 28: ciaa1269. doi: 10.1093/cid/ciaa1269.
4. Stock AD, Bader ER, Cezayirli P, Inocencio J, Chalmers SA, Yassari R, Yanamadala V, Eskandar E. COVID-19 Infection Among Healthcare Workers: Serological Findings Supporting Routine Testing. Front Med (Lausanne). 2020; 7: 471.
5. Rajasingham R, Bangdiwala AS, Nicol MR, Skipper CP, Pastick KA, Axelrod ML, Pullen MF, Nascene AA, Williams DA, Engen NW, Okafor EC, Rini BI, Mayer IA, McDonald EG, Lee TC, Li P, MacKenzie LJ, Balko JM, Dunlop SJ, Hullsiek KH, Boulware DR, Lofgren SM; COVID PREP team. Hydroxychloroquine as Pre-exposure Prophylaxis for Coronavirus Disease 2019 (COVID-19) in Healthcare Workers: A Randomized Trial. Clin Infect Dis. 2021; 72(11): e835-e843.
6. Revollo B, Tebe C, Peñafiel J, et al. Hydroxychloroquine pre-exposure prophylaxis for COVID-19 in healthcare workers. J Antimicrob Chemother. 2021; 76(3): 827-829.
7. Bhimraj A, Morgan RL, Shumaker AH, Lavergne V, Baden L, Cheng VC, Edwards KM, Gandhi R, Muller WJ, O'Horo JC, Shoham S, Murad MH, Mustafa RA, Sultan S, Falck-Ytter Y. Infectious Diseases Society of America Guidelines on the Treatment and Management of Patients with COVID-19. Clin Infect Dis. 2020 Apr 27:ciaa478. doi: 10.1093/cid/ciaa478.
8. Behera P, Patro BK, Singh AK, Chandanshive PD, S R R, Pradhan SK, Pentapati SSK, Batmanabane G, Mohapatra PR, Padhy BM, Bal SK, Singh SR, Mohanty RR. Role of ivermectin in the prevention of SARS-CoV-2 infection among healthcare workers in India: A matched case-control study. PLoS One. 2021; 16(2): e0247163.

Volume 4, Issue 4; July-August 2021; Page No 821-827

9. Rotti H, Raval R, Anchan S, Bellampalli R, Bhale S, Bharadwaj R, et al. Determinants of Prakriti, the human constitution types of Indian traditional medicine and its correlation with contemporary science. J Ayurveda Integr Med. 2014; 5: 167-75.
10. Tillu G, Chaturvedi S, Chopra A, Patwardhan B. Public health approach of ayurveda and yoga for COVID-19 prophylaxis. The Journal of Alternative and Complementary Medicine. 2020; 26(5): 360-4.
11. Golechha M. Time to realise the true potential of Ayurveda against COVID-19. Brain, behavior, and immunity. 2020; 87: 130.
12. Kumar A, Naik SN. Ghee: Its properties, importance and health benefits. Lipid Universe 2018; 6: 1-9.
13. Bonfoh B, Zinsstag J, Farah Z, Simbé CF, Alfaroukh IO, Aebi R, et al. Raw milk composition of Malian Zebu cows (Bos indicus) raised under traditional system. Journal of Food Composition and Analysis 2005; 18: 29-38.
14. Zeenat F. An appraisal of medicinal properties of Shibb-e-Yamani (Alum): A review. UniMed-Kulliyat 2018; 10: 78-87.
15. Council of State and Territorial Epidemiologists. Interim-20-ID-02: Standardized surveillance case definition and national notification for 2019 novel coronavirus disease (COVID-19). Available at: https://asprtracie.hhs.gov/technical-resources/resource/8322/standardized-surveillance-case-definition-and-national-notification-for-2019-novel-coronavirus-disease-covid-19 (Accessed on 3 July 2021).
16. Xiao J, Fang M, Chen Q, He B. SARS, MERS and COVID-19 among healthcare workers: A narrative review. J Infect Public Health. 2020; 13(6): 843-848.
17. Waage S, Pallesen S, Vedaa Ø, Buchvold H, Blytt KM, Harris A, Bjorvatn B. Sleep patterns among Norwegian nurses between the first and second wave of the COVID-19 pandemic. BMC Nurs. 2021; 20(1): 105.
18. Mahajan NN, Mathe A, Patokar GA, Bahirat S, Lokhande PD, Rakh V, Gajbhiye R, Rathi S, Tilve A, Mahajan K, Mohite SC. Prevalence and Clinical Presentation of COVID-19 among Healthcare Workers at a Dedicated Hospital in India. J Assoc Physicians India. 2020; 68(12): 16-21.
19. Banerjee A, Mukherjee K, Bhattacharjee D, Garai D, Chakraborty R. Status of Health-care Workers in Relation to COVID-19 Infection: A Retrospective Study in a Level 4 COVID Hospital in Eastern India. J Assoc Physicians India. 2020; 68(12): 55-57.
20. Araghi F, Tabary M, Gheisari M, Abdollahimajd F, Dadkhahfar S. Hand Hygiene Among Health Care Workers During COVID-19 Pandemic: Challenges and Recommendations. Dermatitis. 2020; 31(4): 233-237.
21. Guertler A, Moellhoff N, Schenck TL, Hagen CS, Kendziora B, Giunta RE, French LE, Reinholz M. Onset of occupational hand eczema among healthcare workers during the SARS-CoV-2 pandemic: Comparing a single surgical site with a COVID-19 intensive care unit. Contact Dermatitis. 2020; 83(2): 108-114.
22. Emami A, Javanmardi F, Keshavarzi A, Pirbonyeh N. Hidden threat lurking behind the alcohol sanitizers in COVID-19 outbreak. Dermatol Ther. 2020; 33(4): e13627.
23. Rivett L, Sridhar S, Sparkes D, Routledge M, Jones NK, Forrest S, Young J, Pereira-Dias J, Hamilton WL, Ferris M, Torok ME, Meredith L; CITIID-NIHR COVID-19 BioResource Collaboration, Curran MD, Fuller S, Chaudhry A, Shaw A, Samworth RJ, Bradley JR, Dougan G, Smith KG, Lehner PJ, Matheson NJ, Wright G, Goodfellow IG, Baker S, Weekes MP. Screening of healthcare workers for SARS-CoV-2 highlights the role of asymptomatic carriage in COVID-19 transmission. Elife. 2020; 9: e58728.

Volume 4, Issue 4; July-August 2021; Page No 821-827