Steam Inhalation

RECOMMENDATIONS

We recommend against the use of steam inhalation in the prevention of COVID-19. *(Very low quality of evidence; Strong recommendation)*

We recommend against the use of steam inhalation in the treatment of COVID-19. *(Very low quality of evidence; Strong recommendation)*

Consensus Issues

The panel strongly recommended against the use of steam inhalation as prevention and treatment for COVID-19 inspite of the very low quality of evidence because it was recognized that the potential for harm outweighs the benefit.

EVIDENCE SUMMARY

Is steam inhalation effective in preventing SARS-CoV-2 infection?

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Key Findings

Based on two single arm observational studies with high risk of bias, there is currently only very low quality evidence showing the possible benefit of steam inhalation in the prevention of developing symptomatic COVID-19 among exposed healthy individuals and reducing symptoms and number of days to negative SARS-COV-2 RT-PCR test of COVD-19 confirmed individuals. Meanwhile, there are indirect evidence highlighting the significant adverse effects of steam inhalation among individuals using it for symptomatic relief from the colds.

Introduction

Steam inhalation is a traditional practice used as a home remedy for treating common colds. It is thought to provide relief by loosening mucus, opening up the nasal passage, reducing mucosal inflammation and inhibiting viral replication by heat inactivation. Published articles supporting its use are varying but a systematic review published in Cochrane showed no association between symptomatic relief, reduction of clinical

severity and having a positive viral culture from nasal washings from the common colds and use of steam inhalation [1]. The Philippines has a diverse culture and is known for certain populations having strong beliefs in traditional medicine sometimes choosing these over scientifically sound treatment options, hence this review.

Review Methods

We searched for articles investigating the use of steam inhalation (I) in the prevention of COVID-19 (O) among healthy individuals (P).

We performed a systematic literature search in online databases such as MEDLINE, CENTRAL, and Google Scholar. Additional searches in MedRxiv, clinicaltrials.gov, and WHO ICTRP were also done to look for articles awaiting publication and ongoing clinical trials, respectively. We used search mesh terms for “steam inhalation,” “steam treatment,” “prevention,” “prophylaxis” and “COVID-19.” References from review articles were also manually searched for additional articles.

Results

We found one prospective observational study investigating steam therapy for prevention and treatment of COVID-19 and one single-arm interventional study as treatment of COVID-19 [2,3].

As prevention

An observational study investigated the role of steam inhalation for the prevention and treatment of COVID-19 [2]. In this study, one group composed of asymptomatic healthcare workers who were exposed to COVID-19 patients either through direct contact or travel were advised to take in steam at least twice daily for five minutes (n=25). None of the participants developed any symptoms throughout the follow-up duration (14 days to 2 months). There was, however, no control group in this study. There was also no mention of whether the participants were tested for COVID-19, the adherence to the intervention or if they received any other treatment, used other personal protective equipment, and how symptoms were assessed (self-reported or with an independent assessor); hence, this study had a high risk for bias.

As treatment

In the same study a second group of people (n=80) composed of patients and healthcare workers) were observed. These were COVID-19 confirmed cases who had mild to moderate symptoms. They were given steam inhalation for five minutes every three hours. Outcome assessed was regression of symptoms and number of days to having a

negative COVID-19 test. For this group, patients having mild symptoms recovered in a mean of 3 days while those having moderate symptoms recovered in 7 to 10 days. Test for COVID-19 became negative after 10 days for 65 (81%) of the participants, 14 days for 78 of them (97.5%) and 18 days for everyone to have negative result. Issues with this study include no mention of concurrent treatment, no mention if patients were admitted, total number of days steam inhalation was given, their adherence to steam inhalation, at what day of illness intervention was started. It also had no control group.

Another study investigated ten asymptomatic and pauci-asymptomatic healthcare professionals who tested positive for COVID-19 (N=10) [3]. Steam inhalation was given for at least twenty minutes either by 4 cycles of 5 minutes or 5 cycles of 4 minutes within one hour. The study excluded three from the final pool but monitoring was continued. Among the 7, all tested negative after only one day of steam inhalation, with 4 patients having no symptoms after 5 days while three had still some symptoms but with improvement. This study poses a high risk of bias because there was no control and blinding, no mention of what day of illness the intervention was started, no mention of adherence of participants to the intervention. Moreover, three of the participants did self-swabbing which could have affected yield of the samples. The three excluded participants also happened to be the ones who had a positive test for COVID-19 on repeat testing which adds to the bias of the result of the study.

Safety

There is no mention of safety from the two included studies. However, a published narrative report in the Lancet [4] describes an increase in incidence of scald burn among the pediatric population due to the increased use of steam inhalation for COVID-19 (from average of two scald burn per year from steam inhalation to six cases for just one month). As indirect evidence, a meta-analysis [1] also described that those who received steam inhalation for common colds had a significant higher risk for adverse events (N=65, OR 4.73 95% CI 1.46-15.30) which included nasal and lip irritation, increase in congestion, lightheadedness and general discomfort.

Recommendations from Other Groups

There are no recommendations from other groups on the use of steam inhalation for COVID-19.

Ongoing Studies

Currently, there is one registered clinical trial that will investigate the effect of steam inhalation as a treatment for COVID-19. Recruitment of participants is ongoing and the estimated primary completion of the study is registered on October 2021.

References

[1] Singh M, Singh M, Jaiswal N, Chauhan A. Heated, humidified air for the common cold [Internet]. Vol. 2017, Cochrane Database of Systematic Reviews. John Wiley and Sons Ltd; 2017 [cited 2021 Feb 22]. Available from: /pmc/articles/PMC6483632/

[2] Pawar S, Bhonsale D, Pawar D, Bhalla R, Mayekar R, Kude P, Bhonsale S (2020). Management of COVID positive medical staff: A medical college and public hospital experience with steam therapy. Med. Med. Sci. 8(6): 056-058.

[3] la Marca G, Barp J, Frenos S, Mugelli A, Galli L, Calistri E, et al. Thermal inactivation of SARS COVID-2 virus: Are steam inhalations a potential treatment? Life Sci [Internet]. 2021 Jan 15 [cited 2021 Feb 22];265. Available from: https://pubmed.ncbi.nlm.nih.gov/33232690/

[4] Brewster CT, Choong J, Thomas C, Wilson D, Moiemen N. Steam inhalation and paediatric burns during the COVID-19 pandemic. Lancet [Internet]. 2020;395(10238):1690. Available from: http://dx.doi.org/10.1016/S0140-6736(20)31144-2

Appendix 1. Characteristics of included studies

Authors	Country	Population	Intervention	Control	Outcomes	Results
La Marca (Italy)	Single center open label intervention al study	Asymptomatic or pauci-symptimatic (2-3 mild to moderate symptoms) healthcare professionals working at a Hospital with positive rhinopharyngeal swab Exclusion criteria for enrolment a history of pre-existing allergies and/or asthma, ongoing drug therapies against SARS-CoV-2, and individuals with multiple symptoms consistent with COVID infection.	Steam inhalation for at least 20 minutes (either 4 cycles of 5 minutes or 5 cycles of 4 minutes) within 1 hour. temperature of boiled water was maintained at 55-65 C in the first 4-5minutes after initiation of boiling	None	Reduction of viral shedding after 4 days (at elast 6 cycle threshold measured with RT PCR) Complete virus elimination after 4 days	n=10 (3 patients met exclusion criteria) 1/7 asymptomatic all throughout 6/7 improvement of symptoms after end of study period - 3 improvement of all symptoms - 2 persistent anosmia and ageusia - 1 mild muscle pain and nasal congestion 7/7- tested negative on RT-PCR
Pawar	Prospective observation al	Group 1: asymptomatic healthcare workers exposed to COVID-19 either thourgh travel or direct contact (n= 25) group 2: mild or moderate COVID-19 PCR confirmed patients (n=80 patient and health care workers) Severe patients excluded	Inhalation of steam twice daily, either through ordinary steamers or by boiling of water - Grp 1: 5mins byt nasal route BID (no mention of duration of treatment) - Grp 2: 5mins every 3 hours	None	RT PCR result after 5 days of steam inhalation, and until COvID was negative for two consecutive tests symptom pattern	No patients in group 1 developed symptoms (14 days to 2 months follow-up) Group 2 regression of symtptoms - for mild symptoms, mean of 3 days to return to normal - for moderate symptoms, 7-10 days to return to normal COVID-19 test - after 10 days since start: 65/80

						turned negative (81%) - after 14 days since start: 78/80 turned negative (97.5%) - after 18 days since start: 80/80 turned negative (100%)

Appendix 2. GRADE Evidence Profile

Question: Should steam inhalation compared to no steam inhalation for COVID-19 treatment
Setting: COVID-19 confirmed patients

Certainty assessment							Impact	Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations			
recovery									
2	observational studies	very serious [a]	not serious	not serious	not serious	publication bias strongly suspected [b]	in one study, patients having mild symptoms recovered in a mean of 3 days while those having moderate symptoms recovered in 7 to 10 days in the other study, all seven had recovered after five days	⨁◯◯◯ VERY LOW	IMPORTANT
time to negative RT-PCR									
2	observational studies	very serious [a]	not serious	not serious	not serious	publication bias strongly suspected [b]	Test for COVID-19 became negative after 10 days for 65 (81%) of the participants, 14 days for 78 of them (97.5%). in the other study, all included participants became negative after one day of steam inhalation	⨁◯◯◯ VERY LOW	IMPORTANT

CI: Confidence interval

Explanations

a. no mention of how symptoms was monitored (self monitoring or independent assessor), no mention of participants' adherence to the protocol and at what day of ilneess the intervention was given
b. limited presentation of data

Appendix 3. Characteristics of ongoing studies

	Clinical Trial ID / Title	Status	Start and estimated primary completion date	Study design	Country	Population	Intervention Group(s)	Comparison Group(s)	Outcomes
1	NCT04743349 Steam Inhalations in COVID-19 Patients (Steam-COVID)	recruiting	Study Start: January 26,2021 Primary Completion: October 31, 2021	Study Design: •Allocation: Randomized •Intervention Model: Parallel Assignment •Masking: single (Outcome Assessor) •Primary Purpose: Treatment	Italy	Adults confirmed to have SARS-Cov-2 within 48 hrs of enrolment and only have no or mild symptoms	Steam inhalation	No steam inhalation	Reduction in viral shedding, clinical outcome, negativization rate