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## Oronasal Hygiene with PVP-I for COVID19

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### Bullet points

- Mouth rinsing, gargling, and nasal irrigation with Povidone-Iodine (PVP-I) is safe and effective for prophylaxis, early treatment, and prevention of transmission of COVID-19
- PVP-I has been used for decades as a broad-spectrum antiseptic in dentistry and otolaryngology, so its use for COVID-19 is not re-purposing
- PVP-I has been widely used in India to prevent nosocomial transmission of COVID-19
- In clinical trials, PVP-I was up to 90% in prevention hospitalizations and deaths from COVID-19

### Abstract

Application of 0.5%-1.0% PVP-I solution to the nasal cavity, oral cavity, nasopharynx, and oropharynx, 2-4 times per day, is an excellent prophylaxis and adjuvant treatment of early COVID-19. Its use would also prevent or sharply decrease transmission of the virus from contagious persons. Povidone-Iodine (PVP-I) is available over the counter.

This is the conclusion from the available literature, including physicians' recommendations.

### Introduction

PVP-I solution has been used as a broad-spectrum antiseptic, effective against viruses, bacteria, fungi, and other pathogens in dentistry and otolaryngology for decades.

PVP-I was introduced in 1955 (Eggers, 2019). It has demonstrated safety and effectiveness against a broad range of throat and mouth pathogens. It was shown effective against SARS and MERS, influenza viruses, and endemic human coronaviruses (Kanagalingam et al., 2015). Thus, the use of PVP-I against SARS-COV-2 is not repurposing.

Gargling with PVP-I was recommended by Japan's Ministry of (Eggers et al., 2018) (Eggers, 2019) since the 2009 pandemic flu, and by the government of China since the beginning of the COVID-19 pandemic.

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## Methods

This is a narrative review of the literature on the use of PVP-I for prophylaxis and treatment of COVID-19, highlighting the best. All studies from the systematic review <sup>(C19 Anonymous, 2021)</sup>, available on August 13, 2021, have been considered, plus a selection of pre-COVID19 studies and currently available medical protocols as well as doctors' professional reports.

### *Protocols, Proposals, and Medical Experience*

<sup>(FLCCC, 2021)</sup> suggests 3x daily gargling and nasal irrigation with 1% PVP-I solution as part of early treatment. Saline solution is for nasal use. 2x daily gargling is proposed for prophylaxis. Listerine and some other antiseptics are also proposed for gargling / mouth washing.

<sup>(Marik, 2021)</sup> supports <sup>(FLCCC, 2021)</sup> with a special emphasis on the Delta variant. It also stresses that reducing the viral load in URT is likely to reduce disease severity.

<sup>(Arefin, 2021)</sup>, <sup>(Khan and Parab, 2021)</sup> report that many otolaryngology offices in India, including theirs, have asked patients to gargle and to take nasal drops or spray of 0.5%-0.6% PVP-I, before examination and other procedures. They have found that PVP-I is highly tolerable, does not cause tooth stain, and the procedure is practical and useable. They also report that this procedure provided sufficient safety to the personnel and other patients. <sup>(Khan and Parab, 2021)</sup> report that the protection remains sufficient for 4 hours. <sup>(Arefin, 2021)</sup> report that the personnel were required to repeat that procedure every 2-3 hours. Such broad and unremarkable use might explain relative paucity of easily accessible papers on the subject.

Doctors at St. Paul's Sinus Centre are conducting a trial and believe that early sinus rinse and throat gargle with PVP-I would be a game changer in early COVID-19 treatment <sup>(Javer (quoted), 2021)</sup>.

### *Peer Reviewed literature, trials and in vitro*

Nasal and oral cavities, oro- and nasopharynx are primary mucosal surfaces, are occupied by the coronavirus in the first few days of infection <sup>(Khan and Parab, 2021)</sup>. These areas are all connected, and fluids containing it move between them. This suggests that cleansing all the areas at the same time is most beneficial.

The only sufficiently powered clinical trial of PVP-I applied to nasal cavity, nasopharynx, oral cavity, and oropharynx <sup>(Choudhury et al., 2021)</sup> has shown about 10 times decrease (sic!) in deaths and hospitalization. It used gargle/mouthwash, nasal drops, and eye drops with 1% PVP-I in a large cohort of more than 600 COVID-19 patients. Eye drops do not seem essential.

Multiple trials, using only throat or nasal application of PVP-I have confirmed high efficacy of PVP-I, even when not applied to all the areas previously listed.

(Arefin et al., 2021) reports a clinical trial with nasal application only. Nasal irrigation was found superior to nasal spray. 0.5%-0.6% PVP-I caused viral clearance in 89% (48/54) patients, without adverse effects.

(Seet et al., 2021) reports a clinical trial using a PVP-I throat spray. It observes significant decrease of sickness and symptoms compared with placebo and other treatment groups, in real world conditions.

(Elzein et al., 2021) reports a large decrease of viral load in saliva, after mouthwash with PVP-I, measured in PCR cycles ( $C_t$ ), necessary for the detection. The decrease corresponded to 4.5 cycles with PVP-I. The use of PCR test probably underestimates the effect, because PCR detects viral RNA. If the amount of viable virus were measured, the decrease would likely be much larger.

Multiple studies (Anderson et al., 2020) (Bidra et al., 2020) show that 0.5% PVP-I inactivates SARS-COV-2 in 15-30 seconds in vitro.

No study, reporting a lack of efficacy of PVP-I against COVID-19 has been encountered. Temporary elevation of thyroid stimulating hormone (an adverse side effect) was observed in a small clinical trial applying excessive amounts of PVP-I (Guenezan et al., 2021).

#### *Peer reviewed literature, reviews*

(Chopra et al., 2021) (Frank et al., 2020) review PVP-I activity, mentioning successful inactivation of human CoVs, SARS and MERS in as little as 15 seconds, and recommending 0.5%-1% concentrations.

(Maurya et al., 2021) stresses the use of PVP-I as a second line of defense against COVID-19 in dentistry, describing its safety and tolerability. In agreement with other authors, this paper also recommends that clinical staff use PVP-I every 2-3 hours (up to 4 times a day) and that patients use it before procedures.

#### Discussion

Gargling and nasal irrigation has been traditionally used in India. Gargling was officially adopted by Japan and has been used as a traditional remedy in many European countries. However, these are not traditional procedures in the US. This would partly explain the apparent scarcity of research published in English, and the insufficient interest from the physicians. However, the

successful outcomes of many clinical trials' as well as the practical experiences of many doctors, justify the immediate and broad use of PVP-I in COVID-19 prophylaxis and treatment.

Povidone Iodine, 0.5% solution is sold over the counter, under the brand name Betadine. There is also a 10% solution, used topically, for skin issues. For oral, nasal, or pharynx use, it must be diluted to 1% or less (FLCCC, 2021).

PVP-I could possibly be used alongside other OTC prophylactic and therapeutic treatments of limited effectiveness, such as vitamin C, vitamin D, Quercetin, and Zinc, as well as with drugs such as Ivermectin and Hydroxychloroquine.

There are other mouth rinsing / gargling solutions, including Listerine, with efficacy against COVID-19 (Meyers et al., 2021).

Iodine intolerance and thyroid diseases are among some of the contra-indications for PVP-I use.

## Conclusions

Studies support the successful use of PVP-I (0.5% - 1.0% solution) to prevent and/or treat COVID-19. The best results were obtained by applying PVP-I to the nasal cavity, nasopharynx, oral cavity, and oropharynx, every 4 hours. The methods were nasal irrigation, mouth rinsing, and gargling. Some may also be applied in spray form. Saline solution is preferable for nasal use.

PVP-I works by inactivating the virus on the mucosal surfaces of the mouth, nasal cavity, and throat. It destroys coronavirus' envelope and/or membrane. PVP-I inactivates the virus present at the time of application. It also remains on the mucosal surfaces for some time and continues to destroy virus that appears on them from outside and inside.

PVP-I effect might be underestimated when measured by PCR because PVP-I does not act directly on the RNA, measured by PCR tests.

Observed and expected effects:

- PVP-I prevents infection by destroying virus present on the mucosal surfaces at the time of treatment and some time after it.
- PVP-I improves outcomes in the early phase of infection, by preventing or decreasing the spread of the virus from oro- and nasopharynx into the lungs
- PVP-I reduces viral transmission to others, especially in the early stages, when most of the coronavirus load is in the upper respiratory tract (URT)

PVP-I does not prevent the replication of the coronavirus once it has already infected tissues.

In addition to prophylaxis and treatment of COVID-19, PVP-I can be used for protection of healthcare workers; as a broad acting antiviral with monoclonal antibodies treatment; and as a quick prophylaxis before or after exposure to COVID-19.

#### No Competing Interests

The author declares no competing interest. No funding was provided for this work.

#### Disclaimer

This is not medical advice.

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