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# An Hypothesis About Iodine Low Levels and Related Elements of Prevention Against Covid-19

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**Abstract**

Prevention of Covid-19 leads us to analyze the metabolic pathways related to the virus to highlight the critical points and use simple and economic resources to fight it. The goal of Epigenetic Naturology is to provide the body with the elements it can use to defend itself.

Oral cavity mucosa may be a potentially high-risk route of COVID-19 infection. ACE2 (angiotensin-converting enzyme II) receptor on the oral mucosa, which is also the receptor of SARS-CoV and HCoV-NL63, was observed to be highly expressed by the epithelial cells of the tongue [1], therefore oral cavity is a critical site for the study and prevention of COVID-19 infection. (the) Iodine and/or hydrogen peroxide might be helpful in antiviral effect [2] in the context of COVID-19 pandemic [3].

was shown to accumulate in upper airway secretions.

Since the virus also affects the eye mucosa, which is also a gateway to Covid 19, the use of Iodine povidone at 0.5- 0.6%, may enhance innate antiviral defenses [ ].

Gargling with 3% hydrogen peroxide (10 vol) [5], diluted in 2 parts of water, 3 times a day and nebulization in the nostrils 2 times a day for 1 minute, but diluted to 50% because of the nasal mucosa is more delicate, can help [6].

1. <https://www.practiceupdate.com/content/oral-mucosa-shows-high-expression-of-ace2-receptor-of-2019-ncov/100665> Oral Mucosa Shows High Expression of ACE2 Receptor of 2019-nCoV- Luiz Meirelles, DDS, MS, PhD

2. <https://link.springer.com/article/10.1007/s40121-019-00260-x> Infectious Disease Management and Control with Povidone Iodine, Maren Eggers

3. (Fischer AJ, Lennemann NJ, Krishnamurthy S, et al. Enhancement of Respiratory Mucosal Antiviral Defenses by the Oxidation of Iodide. American Journal of Respiratory Cell and Molecular Biology [Internet] 2011;45(4):874–81. Available from: <https://doi.org/10.1165/rcmb.2010-0329OC> ).

4. COVID-19 and iodide 1M.Sc.,mika.turkia@alumni.helsinki.fi, 26.4.2020.

5. Caruso, A., Del Prete, A., Lazzarino, A., Capaldi, R., & Grumetto, L. (2020). May hydrogen peroxide reduce the hospitalization rate and complications of SARS-CoV-2 infection? Infection Control & Hospital Epidemiology, 1-5. doi:10.1017/ice.2020.170

6. Cortelyou PR. Use of peroxide of hydrogen in diseases of the throat and nose. J Med Assoc Ga. 1968; 57(9):449-50.

The action should be not only due to the already known oxidizing and mechanical removal properties of hydrogen peroxide correlated to the foam, but also (due) to the induction of the innate antiviral inflammatory response by the overexpression of TLR37, thus reducing the progression of the infection from the upper to the lower respiratory tract [7].

Given the relatively low toxicity and low cost of production, a randomized controlled trial of supplemental iodide would be feasible; iodine and/or hydrogen peroxide mouthwash and gargling could be a protective device for doctors, nurses and people in contact with covid-19 positive patients.

It is interesting the association with Melatonin, Vitamin D3, Vitamin C, Zinc, Magnesium and Potassium to support chemical reactions related to immune defense. (Remove bold)

## Study

A particular cell receptor (the angiotensin-converting enzyme II; ACE2), which is the receptor of SARS-CoV and HCoV-NL63, was found to be likely also the cell receptor of the COVID-19 virus.

The expression of the ACE2 receptor on the oral mucosa, was observed also on the epithelial cells of the tongue.

These findings indicate that the mucosa of the oral cavity may be a potentially high-risk route of COVID-19 infection.

Studies have shown that mouthwashes and oral gargles with PVP-I-based [8] antiseptics are effective in reduce viral load in the oral cavity and the oropharynx.

World Health Organization emphasized the importance of PVP-I by including it in the list of essential medicines. High virucidal activity has been observed against viruses of significant global concern, including hepatitis A and influenza, as well as the Middle-East Respiratory Syndrome and Sudden Acute Respiratory Syndrome coronaviruses.

Receptor binding analysis revealed that hemagglutinin inhibition is the likely cause of the PVP-I virucidal activity, rather than the inhibition of host-specific sialic acid receptors. The findings also demonstrate(s) two specific mechanisms of reduction of viral growth, namely, PVP-I blockade of viral attachment to the host cell receptors and the inhibition of viral release from infected cells.

Iodide (I<sup>-</sup>) acts as a protective antioxidant in the body. It is oxidized by the peroxidase/H<sub>2</sub>O<sub>2</sub> system to hypoiodite, which is a potent oxidant for microorganisms [9]. Iodide effectively scavenges reactive oxygen species (ROS) in human blood cells.

A single oral dose of 130 mg potassium iodide was shown to accumulate in upper airway secretions. It was suggested that the delivery of I<sup>-</sup> to the airway mucosa may augment innate antiviral defenses [10].

We suppose that the Covid-19 causes a(n) iodine seizure related to a thyroid apoptotic activation.

We think that this process allows the expression of the membrane hemagglutinins; this can trigger the vascular disseminated thrombosis.

This enhances a chain reaction which is activated by the inflammation factors favored by the formation of free radicals and by the cytokine storm.

## Background

In the publication *Pathology of the thyroid in severe acute respiratory syndrome*, it is written that in serum low levels of triiodothyronine and thyroxine, commonly found in patients with SARS, the possibility of thyroid dysfunction raises.

The follicular epithelium was found to be damaged with large numbers of cells exfoliated into the follicle.

The terminal *deoxynucleotidyl transferase-mediated* dUPT nick end-labeling (Tunel) [11], demonstrated many cells undergoing apoptosis.

Follicular architecture was altered and showed distortion, dilatation, and collapse.

No distinct calcitonin-positive cells were detectable in the SARS thyroids.

7. [https://www.researchgate.net/publication/340857967\\_May\\_hydrogen\\_peroxide\\_reduce\\_the\\_hospitalization\\_rate\\_and\\_complications\\_of\\_SARS-CoV-2\\_infection](https://www.researchgate.net/publication/340857967_May_hydrogen_peroxide_reduce_the_hospitalization_rate_and_complications_of_SARS-CoV-2_infection)

8. Infectious Disease Management and Control with Povidone Iodine, Maren Eggers

9. Disinfection of N95 respirators by ionized hydrogen peroxide during pandemic coronavirus disease 2019 (COVID-19) due to SARS-CoV-2 [https://www.journalofhospitalinfection.com/article/S0195-6701\(20\)30178-X/pdf](https://www.journalofhospitalinfection.com/article/S0195-6701(20)30178-X/pdf)

10. COVID-19 and iodide M.Sc.mika.turkia@alumni.helsinki.fi, 26.4.2020.

11. method for detecting DNA fragmentation by labeling the 3- hydroxyl termini in the double-strand DNA breaks generated during apoptosis

In conclusion, both parafollicular and follicular cells were found injured.

This may provide an explanation both for low serum triiodothyronine and thyroxine levels and the osteonecrosis of the femoral head associated with patients with SARS.

Apoptosis may play a role in the pathogenesis of SARS associated coronavirus infection in the thyroid gland.

Overproduction of IL-6 reduces thyroid performance by decreasing the conversion from T4 to T3, resulting in lower T3 levels. This occurs because IL-6 causes oxidative stress and reduces glutathione levels.

### Iodine and Hemo-Agglutinins

We must consider that one of the characteristic symptoms of coronavirus is asthenia, attributable to a possible thyroid involvement.

We know that iodine has a correlation with hemagglutinins and that SARS CoV-2 explodes with disseminated vasal thrombosis.

Surely there must be a correlation between the two events.

The disease could evolve in two steps: the first induces iodine consumption and thyroid deactivation to prepare the ground for a subsequent explosion phase of the disseminated vascular thrombosis which can no more be controlled by iodine.

If this were the case, iodine supplementation would find a protective indication for the second stage of the virus attack.

Research requires monitoring of thyroid function that can be easily investigated on patients screening, which could provide new investigative hypothesis to found new resources to protect the organism from the collapse found in those affected by the disease.

### Warning

Eye drops of povidone iodine have been administered by oculists in some patients: they have experimented loss of smell and taste.

Hence iodine administration must be carefully monitored and calibrated on the patient.

### Conclusions

The recent immunological acquisitions shows that iodine has a powerful antiviral action with an anti-hemagglutin-genic effect.

The possibility of providing iodine oral supplements to compensate for a possible thyroid dysfunction and iodine-related disorders, both pre-existing and caused by the Sars Cov-2 virus, is envisaged.

To help prevent infections, take 130 mg potassium iodide that was shown to accumulate in upper airway secretions.

To protect the eye mucosa, which is also a gateway to Covid 19, the use of Iodine povidone at 0.5- 0.6% may augment innate antiviral defenses [12] (it should be used with caution because some people may have reactions and side effects).

To protect the oral cavity, gargling with 3% hydrogen peroxide (10 vol) [13], diluted in 2 parts of water, without swallowing, 3 times a day, and nebulization in the nostrils 2 times a day for 1 minute, diluted to 50% because of the nasal mucosa is more delicate [14].

Given the relatively low toxicity and low cost, a randomized controlled trial of supplemental iodide would be feasible: iodine and/or hydrogen peroxide mouthwash and gargling when there is a risk of viral infection, could be a protective device for doctors, nurses and people in contact with Covid positive patients.

We can also consider the protective effect of iodine against radioactive particles, following the fires in Chernobyl and the human production.

We must consider that we have an increased rate of thyroid cancer, which affects also more and more young people due to the presence of radioactive particles and radioactive Iodine in the air; we can suppose that there may even be a pathological strengthening between virus and radiation.

Iodine can have a double protective effect: antiviral and anti radioactive on the thyroid.

Prevention with iodine and hydrogen peroxide should be accompanied by the intake of Melatonin [15], a powerful antiviral product also produced by cellular mitochondria, whose production decreases with advancing age; Zinc [16] that prevents the entry of the

12. COVID-19 and iodide 1M.Sc.,mika.turkia@alumni.helsinki.fi, 26.4.2020.

13. Caruso, A., Del Prete, A., Lazzarino, A., Capaldi, R., & Grumetto, L. (2020). May hydrogen peroxide reduce the hospitalization rate and complications of SARS-CoV-2 infection? *Infection Control & Hospital Epidemiology*, 1-5. doi:10.1017/ice.2020.170

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16. Aartjan J. W. te Velhuis, Sjoerd H. E. van den Worm, Amy C. Sims, Ralph S. Baric, Eric J. Snijder, 1 and Martijn J. van Hemert Zn2+ Inhibits Coronavirus and Arterivirus RNA Polymerase Activity In Vitro and Zinc Ionophores Block the Replication of These Viruses in Cell Culture <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2973827/>

virus into cells, vitamin D3 [17] prevents the loss of smell, Glutathione for the antioxidant effect, and at the first symptoms an antiplatelet agent such as heparin [18] with magnesium and potassium in more advanced cases to fight disseminated thrombosis.

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## Conflict of Interest

No conflict of interest.

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