

Copper enhanced nasal saline irrigations: a safe potential treatment and protective factor for COVID-19 infection?*

Thomas Radulesco^{1,2}, Jerome R. Lechien^{1,3-5}, Carlos M. Chiesa-Estomba^{1,6}, Leigh J. Sowerby^{1,7}, Claire Hopkins⁸, Sven Saussez^{3,9}, Justin Michel^{1,2}

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¹ COVID-19 Task Force of the Young-Otolaryngologists of the International Federations of Oto-rhino-laryngological Societies (YO-IFOS)

² Aix Marseille Univ, APHM, IUSTI, La Conception University Hospital, Department of Oto-Rhino-Laryngology Head and Neck Surgery, Marseille, France

³ Department of Human Anatomy and Experimental Oncology, Faculty of Medicine, UMONS Research Institute for Health Sciences and Technology, University of Mons (UMons), Mons, Belgium

⁴ Department of Otolaryngology - Head and Neck Surgery, Foch Hospital, School of Medicine, UFR Simone Veil, Université Versailles Saint-Quentin-en-Yvelines (Paris Saclay University), Paris, France

⁵ Department of Otorhinolaryngology and Head and Neck Surgery, CHU de Bruxelles, CHU Saint-Pierre, School of Medicine, Université Libre de Bruxelles, Brussels, Belgium

⁶ Department of Otorhinolaryngology-Head and Neck Surgery, Hospital Universitario Donostia, San Sebastian, Spain

⁷ Department of Otolaryngology - Head and Neck Surgery, University of Western Ontario, London, Ontario, Canada

⁸ King's College, London, United Kingdom

⁹ Department of Head and Neck Surgery, EpiCURA Hospital, Hornu, Belgium

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To the Editor:

The nasal epithelium has been recognized as an important site of SARS-Cov-2 viral entry and replication ⁽¹⁾. Decreasing viral titers using nasal saline irrigation (NSI) may potentially improve patient outcomes and reduce risk of transmission. Since the outbreak of the COVID-19 pandemic, there has been much discussion regarding the potential use of povidone-iodine to reduce viral load and therefore potentially reduce the risk of transmission and improve patient outcomes. Ramezanpour et al. recently reported on the in vitro safety of 0.5% povidone-iodine (Nasodine), with consideration for use in chronic rhinosinusitis ⁽²⁾. While contact with Nasodine for five minutes appeared to cause no harm, contact for 30 minutes in vitro was found to impact the epithelial barrier structure, highlighting the need for further studies regarding safety. Nasodine is not commercially available outside of Australia, instead many centers are advocating use of diluted solutions of povidone-iodine, but this carries risk of error, which may cause harm; Kim et al. demonstrated that a 5% povidone-iodine solution had a significant and immediate effect on reducing ciliary beat frequency to zero ⁽³⁾. In contrast, nasal saline irrigation (NSI) is a widely used interven-

tion with established safety and tolerability. The use of NSI in COVID-19 remains controversial due a theoretical risk of increased pulmonary dissemination, however there is no published evidence to support this. Indeed, we believe that NSI in itself may be beneficial in COVID-19.

NSI may decrease viral loads in nasal cavities during rhinovirus infection, and viruses can be collected when performing NSI, suggesting a "viral washing-effect" ⁽⁴⁾. Recent computational fluid dynamics studies reported that all nasal regions are reached when performing NSI, particularly using large-volume irrigation versus continuous spraying ⁽⁵⁾.

NSI may also enhance epithelial function. In vitro studies have demonstrated that an isotonic solution with slightly alkaline pH and a composition close to that of sea-water optimizes tropic and functional recovery of the respiratory epithelium ⁽⁶⁾. In chronic rhinosinusitis, NSI improves mucociliary clearance ⁽⁷⁾, allowing removal of pathogens trapped by local IgA. NSI and oral rinse are commonly used in upper respiratory tract infections and have demonstrated superiority regarding duration of illness versus standard care in a randomized controlled trial ⁽⁸⁾. Furthermore, several viruses, including human coronavirus 229E

(HCoV-229E), are inhibited in the presence of NaCl. Ramalingam et al. recently showed that patients using NSI had statistically significant decreased household transmission and viral shedding⁽⁸⁾. Similarly, nasal sprays and irrigations have been shown to reduce the Influenza A viral load in nasal secretions and enhance mucosal barrier function⁽⁹⁾. Hendley et al. found virus concentrations return to baseline 5 days after saline NSI in rhinovirus infections⁽⁴⁾.

We were delighted to find the recent report of Huang et al, describing the in vitro anti-viral efficacy of a widely available, copper enriched saline solution, Sterimar Congestion relief⁽¹⁰⁾. Although hypertonic, which may cause slight nasal irritation, this solution may have the benefits of povidone-iodine but without the risk of toxicity. It is commercially available in many countries and has been widely used without reports of adverse effects. Further more, a recent study in the New England Journal suggests that copper was able to eliminate all viable SARS-Cov-2, while the virus remained viable on a range of other materials⁽¹¹⁾, suggesting that copper may have a unique role as an antiviral that merits further evaluation.

All measures that control infection and viral shedding would help reduce transmission. No study, to date, has evaluated use of copper enriched nasal saline irrigation in COVID-19 positive patients. However, taken together, these data on saline irrigation, the in vitro study of copper enhanced saline, and the potential benefit of copper itself, suggest that this solution may decrease the potential risk of viral infection by both a mechanical and biological effect. As simple as it sounds, copper enhanced saline may be a very useful adjunct in mitigation of COVID-19 – future trials are needed in COVID-19 to evaluate this further.

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Conflict of interest

None

Abbreviations

NSI: nasal saline irrigations

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Dr Thomas Radulesco, MD, PhD, MS
Department of Oto-Rhino-Laryngology
Head and Neck Surgery
La Conception University Hospital
147 Bd Baille
13005 Marseille
France

Tel: +33491435580
Fax: +33491435810
E-mail: thomas.radulesco@ap-hm.fr
ORCID ID: 0000-0002-5939-5372