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## Letter to the Editor

### Methylene blue as an anti-COVID-19 mouthwash in dental practice

Sir,

We read with great interest the paper by Buenaventura and Castro-Ruiz<sup>1</sup> on the use of mouthwashes in dental practice to counter the risk and threat of the COVID-19 pandemic. We complement the authors for a timely paper that recommended the use of mouthwashes to reduce the number of micro-organisms in aerosols and drops during oral procedures.

As the authors rightly mentioned, the use of preprocedural mouthwashes in dental practice may reduce SARS-CoV-2 viral load and decrease the cross infection risk to the health care staff.<sup>1</sup> Therefore, research is urgently needed to test all available mouthwashes for their potential use against this new virus.

In addition to the COVID-19-resisting mouthwashes mentioned by the authors, we would like to suggest methylene blue (MB) as a potential oral rinse to reduce the viral load in aerosols and drops during oropharyngeal procedures.

MB has many therapeutic uses.<sup>2</sup> It is used as a bacteriostatic stain and as an indicator dye. It is a urinary tract antiseptic and acts as a stimulant to mucosal surfaces. It has been described in the literature for the treatment of lower back pain, oral lichen planus pruritus ani, neuroinflammation at the microglial level, oral mucositis, and as an early diagnostic tool for oral cancers and precancerous lesions.<sup>2</sup> Burak et al<sup>3</sup> studied MB as mouthwash for periodontal therapy and found it superior to chlorhexidine gluconate. As MB is an inexpensive and ubiquitously available medication, it may have a considerable potential role in the diagnosis and treatment of various oromucosal conditions.

More recently, there has been a growing focus on the use of MB against COVID-19.<sup>4</sup> It is considered to prevent the cytopathic effect and propagation of RNA virus in three potential ways:

- 1) In a mechanical effect, the easily penetrating reduced MB could competitively occupy cellular sites, necessary for virus attachment, penetration and/or multiplication;
- 2) Reduced MB may act through its redox-potential properties, qualitatively completing the defective oxidative processes of cells or by uncoupling oxidation and phosphorylation;
- 3) Direct or indirect virucidal effect.<sup>4</sup> MB is known to be an effective antioxidant on reactive nitrogen species as it drops the bioavailability of nitric oxide, which is the progenitor of strongly oxidative nitrogen-based molecules. MB also prevents the production of reactive oxygen species by arresting the action of xanthine oxidase.<sup>4</sup>

Based on the above facts, diluted MB appears to be a potentially effective preprocedural mouthwash in dental practice. 0.5% MB oral rinse therapy has already yielded results as a potent, safe, and cost-effective alternative to other mouthwashes.<sup>3</sup>

In the case of SARS-CoV-2, the salivary gland could be a major source of the virus in saliva (Liu et al).<sup>5</sup> Therefore, we suggest repeated use of mouth wash every five to ten minutes during dental procedures to decrease the viral load of freshly secreted saliva.

### Conflict of interest

We have no conflicts of interest.

### Ethics statement/confirmation of patients' permission

Not applicable.

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