

Letters to the Editor

Necrotizing gingivitis associated with COVID-19 infection: causation or coincidence?

We present here a case of a patient with necrotizing gingivitis associated with a suspected COVID-19 infection.

Necrotizing gingivitis is characterized by the three acute clinical features (papilla necrosis, bleeding and pain) and are strongly associated with impaired host immune responses.

Necrotizing gingivitis, also known as Trench-mouth, was typically seen during World War I; and was ostensibly due to multiple risk factors, including poor oral hygiene, psychological stress and malnutrition. In more recent times, it has presented with a lesser frequency within the general population, often seen in an immunocompromised patient, such as those suffering from HIV.

A 35-year-old woman attended the King's College Hospital dental emergency unit reporting a history of fever, intense gingival pain, bleeding gums and halitosis. The fever presented first followed by the oral symptoms 3 days later. She reported no other systemic symptoms or symptoms suggestive of COVID-19. As a result of the pain, the patient was having difficulty eating. The pain was constant, affecting her sleep, and paracetamol did not provide any analgesic benefit. She was medically fit and well, with no known allergies and taking no regular medication. She was a non-smoker, working from home as an auditor for a global advisory firm. She had no risk factors for HIV. She followed good oral hygiene habits, brushing twice daily and flossing once a day, and had started using an alcohol-containing mouthwash. Her last dental visit was 12 months previously, which included a session with the hygienist.

On examination, her temperature was recorded as 37.5°C using a tympanic thermometer. Submandibular lymphadenopathy was evident bilaterally and there was no trismus. Severe halitosis was noted, with generalized erythematous and oedematous gingivae, with loss of interdental papillae in both the

maxillary and mandibular labial sextants. Spontaneous bleeding was noted from the gingival sulcus and there were no signs of any attachment loss.

A clinical diagnosis of necrotizing gingivitis was made, according to the presence of primary clinical symptoms: loss of interdental papillae, spontaneous gingival bleeding and intense pain. The patient was prescribed oral antibiotic (400 mg metronidazole three times daily for 5 days) and oral mouthrinse (0.12% chlorhexidine twice daily for 10 days). Oral hygiene and general nutritional advice was given and, following national guidance on COVID-19, she was advised to return home immediately to self-isolate for 7 days.

The patient was called 5 days later and she reported a significant improvement in her symptoms. She was advised to see her general medical practitioner in the near future for blood-borne viral screening and her dentist for further periodontal support.

In December 2019, an outbreak of a severe acute respiratory syndrome started in Wuhan, China, and has since been declared a pandemic by the WHO. Many cases of COVID-19 are acute and resolve, but the disease has been seen to be fatal. Considering the immunocompromised status of individuals with COVID-19, patients may initially present to dental emergency hubs with acute periodontal conditions. It is important to raise awareness on the primary presentation of necrotizing gingivitis as a manifestation of COVID-19, and to be aware of the current guidance on managing necrotizing gingivitis, with consideration to the national guidance on self-isolation.

Further reading

- Herrera D, Retamal-Valdes B, Alonso B, Feres M. Acute periodontal lesions (periodontal abscesses and necrotizing periodontal diseases) and endo-periodontal lesions. *J Periodontol* 2018; **89**: S85–S102.
- Papapanou PN, Sanz M, Buduneli N, Dietrich T, Feres M, Fine DH *et al.* Periodontitis: Consensus report of workgroup 2 of the 2017 World Workshop on the Classification of Periodontal and

Peri-Implant Diseases and Conditions. *J Periodontol* 2018; **89**: S173–S182.

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Increased risk of analgesic overdose during the COVID-19 pandemic

Studies have previously reported accidental analgesia overdoses in patients attempting to self-manage their dental pain because of difficulty in accessing emergency dental services.^{1,2} The UK and many other countries have paused routine care and re-structured public health services to provide emergency dental care only during the COVID-19 pandemic. This reduced availability of dental services, in addition to self-isolation recommendations, are likely to result in patients self-managing symptoms of dental pain with over-the-counter analgesics, such as acetaminophen (paracetamol) and non-steroidal anti-inflammatory drugs (NSAIDs) and they are therefore at greater risk of analgesia overdose.^{3,4}

It is important that patients in pain receive urgent care advice and intervention, as appropriate. For example, patients experiencing symptomatic pulpitis require extirpation of the pulp or extraction of the tooth, but it may be appropriate to manage any delay, for a short period during the pandemic, with analgesics and ask for guidance should symptoms worsen.

When analgesics are recommended, dentists should enquire about any current analgesic use as part of their medical history check, to avoid potential drug overdoses. This should also include an enquiry into other medicinal or 'home remedy' products patients may be taking which could also contain analgesics. Paracetamol is the most common drug responsible for overdoses, causing hepatotoxicity and affecting 90,000 patients each year in the UK.⁵ For healthy adults (aged 18 and over), the maximum dose of paracetamol is 4 g in 24 hours and for children this varies, depending on age.⁶

NICE guidelines state that, in an acute overdose, 'patients who have ingested 75 mg/kg or more of paracetamol in less

than 1 hour should be referred to hospital. Treatment with Acetylcysteine has been shown to decrease morbidity and mortality.⁷

For a staggered overdose (exceeding the recommended limits beyond an hour), the risk of toxicity is rare for doses between 75–150 mg/kg.^{8,9} Nonetheless, patients should be medically assessed if there are concerns of overdose. Toxicity is unlikely to occur if <75 mg/kg of paracetamol has been ingested within 24 hours,⁸ however, caution needs to be exercised for patients with co-morbidities such as hepatic impairment. Overdoses can be asymptomatic, but nausea, vomiting and abdominal pain can manifest as early symptoms.⁸

Guidance specific for this pandemic is available to dentists to aid prescribing and providing analgesic advice for their patients.^{10,11}

References

- Vogel J, Heard KJ, Carlson C, Lange C, Mitchell G. Dental pain as a risk factor for accidental acetaminophen overdose: a case-control study. *Am J Emerg Med* 2011; **29**: 1125–1129.
- Dodd MD, Graham CA. Unintentional overdose of analgesia secondary to acute dental pain. *Br Dent J* 2002; **193**: 211–212.
- Coulthard P. Dentistry and coronavirus (COVID-19) – moral decision-making. *Br Dent J* 2020; **228**: 503–505.
- Scottish Dental Clinical Effectiveness Programme. Drugs for the Management of Dental Problems During COVID-19 Pandemic. United Kingdom: NHS, 2020. Available from: <http://www.sdcep.org.uk/wp-content/uploads/2020/04/SDCEP-MADP-COVID-19-drug-supplement-080420.pdf> (Accessed 11 April 2020).
- Wallace CI, Dargan PI, Jones AL. Paracetamol overdose: an evidence based flowchart to guide management. *Emerg Med J* 2002; **19**: 202.
- National Institute for Health and Care Excellence. PARACETAMOL. United Kingdom: BNF, 2020. Available from: <https://bnf.nice.org.uk/drug/paracetamol.html> (Accessed 10 April 2020).
- Chiew AL, Gluud C, Brok J, Buckley NA. Interventions for paracetamol (acetaminophen) overdose. *Cochrane Database Syst Rev* 2018; **23**: Cd003328.
- Heard K, Newton A. Paracetamol overdose. United Kingdom: BMJ Best Practice, 2018. Available from: <https://bestpractice.bmj.com/topics/en-gb/337> (Accessed 10 April 2020).
- National Institute for Health and Care Excellence. Poisoning, emergency treatment. United Kingdom: BNF, 2020. Available from: <https://bnf.nice.org.uk/treatment-summary/poisoning-emergency-treatment.html> (Accessed 10 April 2020).
- Scottish Dental Clinical Effectiveness Programme. Management of Acute Dental Problems During COVID-19 Pandemic. United Kingdom: NHS, 2020. Available from: <http://www.sdcep.org.uk/published-guidance/acute-dental-problems-covid-19/> (Accessed 11 April 2020).
- Skoglund LA, Vigen EC, Coulthard P. Coronavirus and analgesics. *Br Dent J* 2020; **228**: 487.

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Pre-procedural mouthrinse to reduce SARS-CoV-2 viral load

As the current situation regarding the COVID-19 pandemic escalates rapidly all over the world, dental practitioners need to be equipped with up-to-date recommendations regarding effective measures to reduce aerosols during emergency dental procedures. Apart from the essential and enhanced measures, such as: high volume suction, personal protection (PPE), time and procedures for decontamination and between patients, it is also advised to apply a pre-procedural mouthrinse to minimize the viral load intra-orally. According to the launched first version of 'Red Phase Guidance' document, created by All Wales Clinical Dental Leads COVID-19 Group (March 2020), the hydrogen peroxide mouthrinse is suggested to reduce the amount of virus in the aerosol, however, it is not essential and evidence is not clear whether this advice should also cover the COVID case.¹ From the point of view of patients' health and safety, undoubtedly it could be a useful adjunct, as pre-operational antimicrobial mouthrinse is generally believed to reduce the number of oral microbiota. What is more, pre-procedural mouthrinse would be most useful when rubber dam cannot be applied.

Until now, limited evidence-based recommendations suggest that chlorhexidine gluconate, which is commonly used as a mouthwash in dental practice, may not be effective towards SARS-CoV-2.^{2,3} It has been reported that, since SARS-CoV-2 is susceptible to the

oxidation effect, 'pre-procedural mouthrinse containing oxidative agents such as 1% hydrogen peroxide or 0.2% povidone is recommended, for the purpose of reducing the salivary load of micro-organisms, including potentially coronavirus SARS-CoV-2 carriage'.⁴ From a purely clinical point of view, iodine-based antiseptics are generally not recommended due to their potential side-effects, including severe hypersensitivity/allergy reactions. Interestingly, the recent Chinese *Guideline for the Diagnosis and Treatment of Novel Coronavirus Pneumonia* states that the virus is sensitive to ultraviolet and heat and exposure to 56°C for 30 minutes and lipid solvents such as ether, 75% ethanol, chlorine-containing disinfectant, and chloroform can effectively inactivate the virus.⁵ Chlorhexidine has not been effective in inactivating the virus,⁵ despite having a well known and evidence-based antimicrobial effect. Therefore the question arises, why this broad spectrum antibacterial, antifungal and antiviral agent appears not to be an optimal anti-SARS-CoV-2 agent? Evidence-based data elucidated that chlorhexidine mouthwash has been found significantly to increase the lactate-producing oral microbiota that can lower saliva pH, accompanied by a reduction of buffering capacity.⁶ What is more interesting is that low saliva pH can contribute to more potent intracellular viral invasion via an endocytic entry mechanism and low pH-dependent activation during entry into host cells.^{7,8} The endocytic mechanism is believed to be a pH-sensitive process. However, mouthrinsing using some over-the-counter mouthwashes, such as those based on essential oils (eg Listerine), after an acidic challenge, increased salivary pH with a neutralizing effect.^{9,10}

Interestingly, it has been observed that essential oils exhibit inhibitory activity against SARS-CoV and HSV-1 replication *in vitro*.¹¹ In addition, avian (non-human) coronavirus responsible for infectious bronchitis in birds is susceptible to a mixture of essential oils and oleoresins from medicinal plants, exhibiting antiviral activity.¹² It is noteworthy that the antiviral efficacy of various essential oils is highly variable due to their chemical characteristics and not pre-eminent for all strains. Nevertheless, the mechanism of coronavirus virulence