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Short communication

Reactive Oxygen spray as prophylaxis for COVID-19 infection

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Viral transmission of SARS-CoV-2, the virus causing COVID-19 is very high within households despite self isolation [1,2]. Transmission of the virus is thought to be similar to that of influenza. Virus is shed into respiratory secretions which can be transferred through coarse droplets or fine aerosol released when a person coughs, sneezes or talks. These droplets/aerosols may infect another either by direct contact with the mucous membranes or through fomite transmission.

Recent evidence suggests that the viral loads in throat swab and sputum samples peak at around 5–6 days after symptom onset [2]. Active viral replication has been shown to take place in the throat, with very high viral loads in the first week of symptoms. Shedding of viral RNA from sputum outlasts the end of symptoms [3]. Another study documenting the viral loads of 76 patients found the mean viral load of severe cases was around 60 times higher than that of mild cases, suggesting that higher viral loads might be associated with more severe clinical outcomes, as well as greater risk of transmission [4]. Reduction of viral load in the nasopharynx may be possible with virucidal agents and this may have several benefits in reducing severity of disease and transmission.

Reactive Oxygen (RO) is a novel antimicrobial which releases oxygen radicals when in contact with water [5,6]. It has been developed for soft tissue infection [7,8]. RO is highly antimicrobial and also has antiviral activity in limited testing [6,9]. A three-armed Randomised Controlled Trial (RCT) is in preparation to investigate and compare the properties of RO administered as a spray (RO-101, Matoke Pharma, UK), povidone iodine nasal and mouth wash and saline in reducing nasopharyngeal COVID-19 viral load and controlling transmission. This short communication is the first report of the use of RO in a household COVID-19 situation as a pilot to the planned RCT.

The index case, a 59 year old female, developed symptoms on Day 1: cough, mild shortness of breath, fever. She tested positive by PCR of nasopharyngeal swabs on Day 3 with a Cycle Threshold (CT) value of 26. The household of 5 which included health care workers went into self-isolation. The household, including the positive index case, started RO treatment, spray to the throat and up each nostril three times a day. The four contacts, male 61, female 30, male 27, female 25 were swabbed on day 4 and all were negative.

RO treatment was continued in the contacts for 5 days. On Day 8 all members of the household were swabbed. The index case remained positive with a CT value of 24, the other household contacts remained well and were negative. The index case continued RO treatment. The household were reswabbed on Day 14. All members of the household including the index case were COVID-19 PCR negative. The contacts remained well and the index case continued to have a mild cough. RO spray was well tolerated with no adverse effects apart from mild transient nasal irritation.

Viral secretion in the index case remained at a similar level from days 3 to 8, although the PCR gives no indication of viral viability. Viral load had fallen to zero by day 14. While no conclusions can be drawn from a single group, there was no increase in viral load in the index case after day 3, there was no transmission to close contacts and the RO spray was well tolerated and appears safe.

We have shown in this small pilot that RO nasopharyngeal spray is tolerated and easy to administer. We suggest that routine use of RO as early therapy in cases and prophylaxis in close contacts could impact on the spread of the disease by reducing transmission and complement PPE, handwashing

and isolation. This may help control transmission in hospitals, care homes and the community. It may reduce the number of medical care workers infected in the course of their work, particularly while carrying out aerosol generating procedures. By reducing viral load, it may reduce severity and extension of infection and therefore the number of the most severe cases, reducing the critical demand for ventilators and ICU beds. We also suggest that by inactivation of COVID-19 in the upper respiratory tract of contacts, it may allow the development of local immunity, preventing extension of infection. This needs urgent further investigation. It appears to be a safe and simple intervention.

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