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Coronavirus antibody positive tests and continued use of personal protective equipment throughout the pandemic

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Abstract

The COVID-19 pandemic has thrust not only a novel virus onto the world, but new challenges resulting in novel approaches. Governments have reduced regulation in order to facilitate timely advances to combat the disease. Antibody testing has rapidly been deployed but it is creating challenges for staff and patients. Mask use has come to the forefront and human factor (HF) strategies must be examined to reduce risk associated with lack of engagement from both healthcare staff and patients. In this we explore these issues and suggest some solutions. © 2020 The British Association of Oral and Maxillofacial Surgeons. Published by Elsevier Ltd. All rights reserved.

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Introduction

A new global pandemic of the novel Coronavirus (SARS-CoV-2) known as COVID-19 circulated the globe from December 2019 creating an unparalleled situation, particularly in the Western World renowned to have excellent primary and tertiary medicine facilities.¹ This unprecedented socio-political and economic upheaval will have long reaching ramifications. As our understanding of this pandemic evolves, so too has the approach to combat the disease. We have seen retractions of published literature in high impact factor journals² and spread of misinformation from all sources including senior political figures.³ Despite mapping of its genome, the virus is still not understood.⁴ Key aspects such as long-term immunity remains unknown with much of the current knowledge applied from MERS-CoV and SARS-CoV.⁵ While there is evidence of antibody response,

studies are low in participant numbers and the follow-up testing has been done over a relatively short period of time.⁶ A worrying study showed 30% of patients tested had very low neutralising antibody (Nab) titres and 6% of these tested had no response after 2 weeks.⁶ There is currently a paucity of information about the longevity of antibody response with COVID-19 with some studies suggesting that re-infection with a homologous coronavirus is possible after as little as 80 days.⁶ This raises the distinct possibility of reinfection for those with mild symptoms or asymptomatic carriers which could perpetuate a second wave.⁷

Human factors (HF) have been a key factor in the COVID-19 response with much focus on this area over recent months to help reduce medical error.⁸ Raising HF awareness and knowledge needs to continue as many staff remain unaware of their importance.⁹ There have been many positives during this crisis particularly when setting up the UK National Health Service (NHS) Nightingale where military command and control was established with real examples of flattening of hierarchy demonstrated.¹⁰ However, during the pandemic

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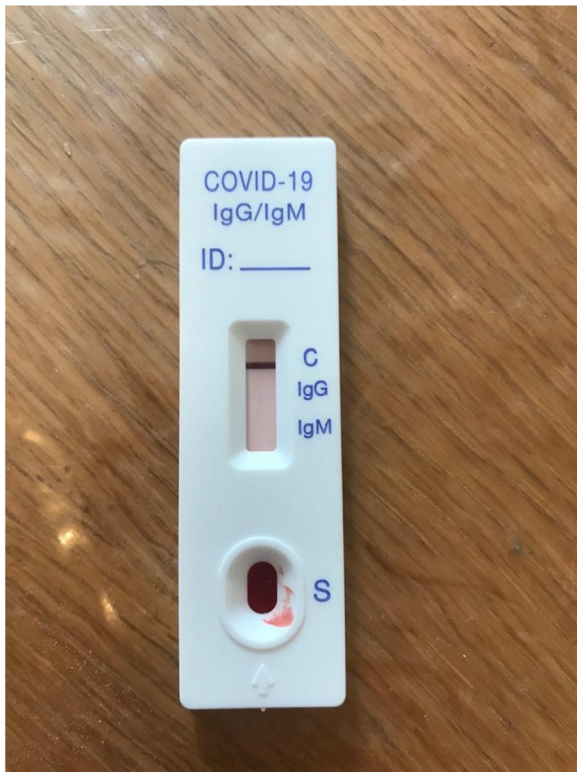


Fig. 1. Showing a novel COVID-19 home antibody test.

while rapid innovation has occurred, this can sometimes be with reduced regulation¹¹ to allow for rapid development to help combat the disease. This has led to medical products and devices entering the market without the same quality assurance rigor that would be usually applied.

Testing reliability

One area of concern is reliable testing as the COVID-19 RT-PCR swab has a 30% false negative rate¹² and a delayed virus clearance can mimic re-infection due to the presence of dead RNA.¹³ These outcomes can result in patients believing they have never had COVID-19 or that they continue to have the disease. The NHS has recently introduced serum antibody testing¹⁴ with the theory that with development of an immunity passport, individuals could go about their business secure in the knowledge that they are “immune” to the virus.¹⁵ Suggested plans have included developing a cohort of immune staff to care for COVID-19 patients allowing for a relaxation of overstretched personal protection equipment (PPE) resources.

There are a number of serological tests available of dubious provenance (Fig. 1). The most reliable are those being developed by pharmaceutical giants such as Abbot and Roche.¹⁶ As mentioned in a recent publication current COVID-19 antibody tests are similar to the first-generation HIV tests.¹⁷ If current COVID-19 antibody testing was sim-

ilar to the equivalent HIV tests with a specificity of 99.5%, public and healthcare confidence in them would be much higher.¹⁸ The 95% confidence intervals for Roche antibody testing kits are between 75% to 91% whilst Abbot is between 87% to 98%. This variation shows that up to 25% could be given an incorrect result with the Roche test.¹⁶

Mask usage

Public health measures such as good hand hygiene, the use of mucous membrane protection with goggles and masks, social distancing, isolation and contact tracing are the mainstay of prevention of this disease.¹ Masks reduce nosocomial spread and are important, particularly for healthcare staff.¹⁹ On the 5th June 2020, the UK Secretary of State for Health and Social Care announced that from 15th June 2020 all healthcare workers and visitors will need to wear masks in hospital.²⁰ With increasing antibody testing in medical staff it is pertinent that those with positive antibody tests continue to wear their masks. With a substantial proportion of healthcare worker remaining asymptomatic carriers of the disease,²¹ hospital staff can remain vectors for COVID-19. Those with a positive antibody test could have a false positive or indeed potentially become re-infected. A positive antibody result therefore should not be assumed to lead to immunity and thus complacency can be avoided.

Wearing a facemask can maintain a certain discipline amongst healthcare staff²² making other infection control methods more likely to occur. The use of surgical facemasks also protects others from²³ but offers relatively little protection to the wearer.¹⁹ With healthcare staff often requiring to be within one metre of a patient for examination and treatment, social distancing is impossible in these circumstances. It is imperative that both patient and staff wear a surgical mask as a minimum to help mitigate this risk.¹ It is important that even if staff are immune, they continue to use masks as others passive followers may follow the leader.²⁴ This is also critical for patients as it is known the four key elements to a good patient-doctor relationship are trust, knowledge, loyalty, and regard.²⁵ If patients observe a doctor without a mask, they may lose trust, assume that the doctor has dismissed the risk, and not wear a mask themselves despite being highly infectious. This could reduce patient concordance with future medical professionals and increase spread of the disease. As learnt from military medicine, team briefings can be an excellent opportunity to remind staff of a unity of effort¹⁰ and their obligation to wear a mask and to encourage a more assertive followership style.²⁴

Conclusion

COVID-19 has assisted the flattening of team hierarchy and reduced barriers between those working in health and social care. However, some team members will emulate the

behaviour of their leaders and this is particularly prevalent between healthcare professionals and those less experienced or non-qualified staff. It is therefore important that those in positions of authority provide adequate role modelling. For the antibody test, even after the exact nature of protection is determined, basic public health measures are not forgotten and that staff feel able to challenge those in more authoritative positions regarding PPE. It is even more important than ever for leaders to conduct team briefings reminding others of the importance of facemask use, continue to flatten hierarchy and encourage assertive followership.

Conflict of interest

We have no conflicts of interest.

Ethics statement/confirmation of patients' permission

Not applicable.

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