Implementing rapid diagnostics for COVID-19

We congratulate Nathan Brendish and colleagues for doing their trial during the first COVID-19 wave.[1] The reduction in turnaround time in the point-of-care testing group was impressive, especially considering 6 months later more than 10% of patients in English hospitals still have to wait more than 24 h for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) PCR test results.[2] We agree that rapid diagnostics offer numerous benefits, but a substantial challenge remains in optimal implementation. In our hospital (Homerton University Hospital, London, UK) we have had access to another rapid diagnostic PCR (Cepheid Xpert Xpress SARS-CoV-2; Cepheid, Sunnyvale, CA, USA) that similarly delivers results within 1 h. In comparison with the study of Brendish and colleagues, in which the point-of-care test was available to all patients at hospital admission, we have used rapid testing on clinician request, for example, to inform a specific patient cohorting decision or if there was a substantial diagnostic uncertainty.

The rapid PCR test assessed by Brendish and colleagues shows good accuracy compared with other PCR-based tests, but all are likely to miss patients who are infected with SARS-CoV-2 but who do not have any virus present on nasopharyngeal swab, which might comprise up to 20% of patients even at peak viraemia.[3] False negatives drive patient management based on clinical grounds. In Brendish and colleagues' study, 13% of patients in each group were either transferred to a definitive area (ie, a designated COVID-19-negative or COVID-19-positive ward) without results, or a clinical decision was made to disregard the test result. All test results are likely to need to be combined with further parameters to estimate true risk of infection.

Disappointingly, no differences in clinical outcomes were seen between the point-of-care testing group and the control group.[1] Although more treatments are now available, patients most likely to benefit from COVID-19-specific treatments are those with more severe disease and therefore also likely to be treated empirically.

Brendish and colleagues' study found a 2·0 day decrease in time to recruitment into other studies for the point-of-care testing group compared with the control group despite a reduction in turnaround time of only 19·6 h. Although not discussed, this finding could be related to less severe illness or out-of-hours admission of participants, which were more common in the control group. Although the authors describe how false positives and negatives were identified in the point-of-care testing group, they did not specify how they were found in the control group. Also it would be interesting to know if a correlation between PCR cycle threshold and severity of illness existed,[4,5] because rapid testing could be used for early prognostication.

Finally, the cost-effectiveness of using rapid diagnostics such as these, which are substantially more expensive than batched laboratory-based PCR testing, needs to be assessed and is particularly relevant because the main benefits of such testing are improved patient flow rather than clinical in nature.

We declare no competing interests.

*Camus Nimmo, Joshua Agbetile, Angshu Bhowmik, Santino Capocci, Raj K Rajakulasingam
c.nimmo@ucl.ac.uk

Department of Respiratory Medicine, Homerton University Hospital NHS Foundation Trust, London, E9 6SR, UK

1   Brendish NJ, Poole S, Naidu VV, et al. Clinical impact of molecular point-of-care testing for suspected COVID-19 in hospital (COV-19POC): a prospective, interventional, non-randomised, controlled study. *Lancet Respir Med* 2020; published online Oct 8. https://doi.org/10.1016/S2213-2600(20)30454-9.

2   Department of Health and Social Care. Weekly statistics for NHS Test and Trace (England) and coronavirus testing (UK): 15 October to 21 October. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/930895/Test_and_Trace_Week21.pdf (accessed Nov 10, 2020).

3   Kucirka LM, Lauer SA, Laeyendecker O, Boon D, Lessler J. Variation in false-negative rate of reverse transcriptase polymerase chain reaction-based SARS-CoV-2 tests by time since exposure. *Ann Intern Med* 2020; **173:** 262–67.

4   Rao SN, Manissero D, Steele VR, Pareja J. A systematic review of the clinical utility of cycle threshold values in the context of COVID-19. *Infect Dis Ther* 2020; **9:** 573–86.

5   Pujadas E, Chaudhry F, McBride R, et al. SARS-CoV-2 viral load predicts COVID-19 mortality. *Lancet Respir Med* 2020; **8:** e70.

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