Which test is best? Frequent versus infrequent testing for the omicron variant of COVID-19

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Testing plays a crucial role in humanity's strategy to mitigate the effects of widespread COVID-19 infection. However, given multiple options for

testing and the emergence of the highly contagious omicron variant, how do we choose which test to use?

A study led by Osaka University recently found that the sensitivity of rapid antigen tests (RATs) for the omicron variant of COVID-19 when compared with polymerase chain reaction (PCR) tests was 0.63 and that this value was not affected by the duration from the onset of symptoms to testing.

This finding suggested the possibility that, as with previous variants, frequent testing using RATs for the omicron variant of COVID-19 still outperformed infrequent testing using PCR tests. This is despite RATs requiring a larger amount of the virus to be present to return a correct positive result (i.e., lower sensitivity) when compared with PCR tests. However, RATs are also cheaper and produce results quickly.

Prior to the emergence of the omicron variant, frequent testing using RATs was known to be a better strategy than infrequent testing using PCR tests. RATs detect infection early, which allows for swift isolation of individuals who are infected, thus preventing the spread of COVID-19.

"The sensitivity of the RATs was important information for setting up an effective testing system," explains lead author Michio Murakami.

However, when the omicron variant of COVID-19 emerged, the sensitivity of RATs for this variant was called into question, particularly during the crucial early stages of infection. If the sensitivity of RATs is low, then the advantages of RATs would be negated, requiring a rethink in testing strategy for combating the spread of infection.

Therefore, the researchers directly compared the sensitivity of RATs and PCR tests in cases of COVID-19 infection known to be caused by the

omicron variant.

"We used data collected from players and staff members of clubs belonging to the Japan Professional Football League," explains co-author Seiya Imoto of The University of Tokyo. "This organization carried out RATs and PCR tests in the same person on the same day, making this data set uniquely useful to assess the comparative sensitivity of these tests."

The results showed that sensitivity was not associated with the duration of the onset of symptoms to testing in both symptomatic and asymptomatic cases. The researchers also found the sensitivity of RATs for the omicron variant to be high enough to suggest the possibility that, when combined with other studies on the relationship between sensitivity or frequency of testing and its effectiveness in preventing infection, frequent testing using RATs, as opposed to less frequent testing using PCR tests, is still the right course of action.

The study findings form an important knowledge base for assessing the effectiveness of a testing system using antigen qualitative tests. However, as the omicron variant is more infectious than previous variants and has a shorter incubation time, the researchers point out that further testing and modeling are required to determine the most effective testing protocol.

The research is published in the journal *BMJ Open*.

More information: Michio Murakami et al, Sensitivity of rapid antigen tests for COVID-19 during the Omicron variant outbreak among players and staff members of the Japan Professional Football League and clubs: a retrospective observational study, *BMJ Open* (2023). DOI: 10.1136/bmjopen-2022-067591

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