

ABSTRACT FOR THEME 1: PANDEMICS & HISTORY

THE IMPORTANCE AND VALIDITY OF THE SARS-COV 2 RAPID SEROLOGICAL TESTS DURING DISEASE SURVEILLANCE IN AMONGST SOUTH AFRICAN CLINICAL SETTING: MILITARY POPULATION

Background

The purpose of the seroprevalence studies for COVID-19 was to assess the extent of undetected transmission in a defined community. Accurate SARS-CoV-2 seroprevalence estimates in different populations could shed light on the extent to which current testing strategies detect all active infections, and thus detect the true magnitude and rate of spread of the infection during the pandemic. Scientific studies were used to demonstrate the clinical significance of SARS COV 2 rapid tests when used within the South African National Defence Force (SANDF) setting. This is something that should be looked into further in different environments. The primary goal was to find valid seroprevalence studies of SARS-CoV-2 infection and compare their estimates to report and impute COVID-19 case rates in the same population, as well as to determine the clinical usefulness of IgG/IqM antibody testing (immuno* chromatographic assay) during disease progression. A link could be established to determine immunogenicity provided by natural infection with SARS COV.2 virus vs vaccination.

Methods

A cross-sectional study was conducted. It was confined to adult members of the SANDF and their dependent, regardless of their occupation. Participants were divided into four categories (IgM exposure, IgG exposure, IgM plus IgG exposure and no exposure based on their risk assessments. After providing a written consent to participate in the study, all participants received a questionnaire to evaluate their demographic information and to explore risk factors associated with Covid-19 transmission. They were subsequently tested for SARS-CoV-2-IgG and IgM antibodies using rapid testing method. The outcomes of rapid testing and its clinical implication on further disease development among the sampled population members were then explored. Rapid tests were randomly done on all subjects and results were

assigned accordingly, whether their Gold standard results were known or not. The overall sensitivity and specificity of the rapid tests were found to be 92% which is within the expected range. The false negative or false positive results were checked against the gold standard. These tests demonstrated the prevalence of exposure in the defined population, as well as the development of immunity and the likelihood of re-infection.

Results

Of the 25 participants tested and fully assessed, 15 (11.4%) were IGM positive indicating recent infection. The group were further subjected to Gold standard testing through PCR testing of nasopharyngeal swabs. 10 (66%) of those subjected to PCR testing yielded positive results and were further isolated accordingly. 46 (35%) were IGG positive indicating past infection. 96 (73%) of those tested did not have any antibodies detected. 0% were vaccinated. The majority of seropositive cases who were not previously identified as COVID-19 cases had prior COVID-like symptoms. The estimated sero-prevalence ranged from 0.31–69 times greater than the number of reported cumulative cases—half of the studies reported more than 5 times more SARS-CoV-2 infections than the total number of cases.

Conclusions

In this study, the findings show that SARS-CoV-2 seroprevalence was far below the indirect protection to infectious diseases required in the population, which is known as "herd immunity". However, the estimated number of infections was far greater than the total number of reported cases and deaths. The majority of seropositive people reported prior COVID-like symptoms, implying that under-testing of symptomatic people may be causing a significant under-estimation or confirmation of SARS-CoV-2 infections.