Characterization of antibody response in asymptomatic and symptomatic SARS-CoV-2 infection

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Background:

SARS-CoV-2 pandemic is causing high morbidity and mortality burden worldwide. Mechanism of infection, protection or rapid evolution until fatal outcome of the disease remains poorly understood. To elucidate the dynamics of humoral response in SARS-CoV-2 asymptomatic and

symptomatic infections, we performed a study to investigate the time course of antibody response in hospitalized COVID-19 patients and asymptomatic SARS-CoV-2 infected subjects.

Methods:

Serum samples were collected from 42 hospitalized COVID-19 patients at 6 different time points (hospital admission, day 2, day 6, day 12-14, day 18-20, day 27-30) and from 25 asymptomatic subjects at 3 different time points (at the time of positive swab, 2 months, 6 months). Samples were tested by commercial ELISA for SARS-CoV-2 spike (S) protein IgA, IgM, and IgG and nucleoprotein (NP) IgG, and by micro-neutralization assay.

Results:

In patients, titres increased for all antibody classes including neutralizing antibody from day 6 to day 18-20 but at day 27-30 started to decline. A high correlation between S and NP antigens and among antibody classes was found. No significant difference in antibody titres at baseline and by peak antibody level was found between recovered and deceased. 64.0% of asymptomatic subjects were negative to any antibody at any time point. Asymptomatic subjects with positive antibody level had titres well below patients, and neutralizing antibodies were found only in 2 subjects (8.0%).

Conclusions:

Our results highlight that COVID-19 patients produce an antibody response to SARS-CoV-2 regardless the outcome. The peak is reached by 3 weeks from hospital admission followed by a sharp decrease. On the contrary, only few asymptomatic subjects develop antibodies at detectable levels, though lower compared to COVID-19 patients. Since neutralizing antibodies were rarely produced, this finding raises the question about the protection of these subjects against reinfection.

Key messages:

- COVID-19 patients produce an antibody response to SARS-CoV-2 which does not differ between recovered and deceased.
- Only few asymptomatic SARS-CoV-2 infected subjects develop antibodies and neutralizing antibodies were rarely produced.