Differential expression of type I interferon and inflammatory genes in SARS-CoV-2 infected patients treated with monoclonal antibodies

Giancarlo Ceccarelli[1], Luca Maddaloni[1], Letizia Santinelli[1], Ginevra Bugani[1], Elio Gentilini Cacciola[1], Alessandro Lazzaro[1], Chiara M. Lofaro[1], Sara Caiazzo[1], Federica Frasca[2], Matteo Fracella[2], Camilla Ajassa[1], Cristiana Leanza[1], Anna Napoli[2], Lilia Cinti[2], Aurelia Gaeta[1], Guido Antonelli[2], Claudio Maria Mastroianni[1], Carolina Scagnolari[2], and Gabriella d'Ettorre[1]

[1]Universita degli Studi di Roma La Sapienza Dipartimento di Sanita Pubblica e Malattie Infettive
[2]Universita degli Studi di Roma La Sapienza Dipartimento di Medicina Molecolare

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Abstract

Considering the efficacy of monoclonal antibodies (mAbs) directed against the Spike (S) protein of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in reducing disease severity, the aim of this study was to investigate the innate immune response before and after mAbs treatment in 72 vaccinated and 31 unvaccinated SARS-CoV-2 patients. Type I interferon (IFN-I) signature and cytokines genes were evaluated by real time RT-PCR. The vaccinated patients had increased negative rate of SARS-CoV-2 RT/real-time PCR tests as compared to unvaccinated ones after mAbs treatment. Unvaccinated patients but also those that resulted negative for serum anti-S antibodies despite vaccination had lower IFN-I and higher IFN-I related genes and cytokines mRNAs levels as compared to vaccinated individuals before mAbs. In addition, patients with low anti-S antibody titer showed immune genes expression levels between those found in negative and patients with high titer of anti-S antibodies. Changes in IFN-I pathway and cytokines levels were observed in unvaccinated patients after mAbs treatment, while the expression of most of the type I IFN genes and cytokines analysed, except for ISGs and IL-10 mRNAs, remained unchanged vaccinated patients. These data suggest that mAbs treatment is associated to a different virological and immunological response in SARS-CoV-2 infected patients according to their vaccination status and related anti-S antibodies titers.

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