T-CELL RESPONSE QUALITY TO ACUTE SARS-CoV-2 INFECTION, IMMUNE MEMORY AND HCoV

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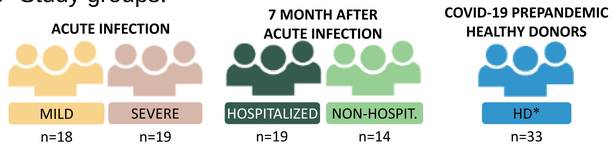
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BACKGROUND

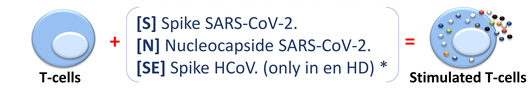
SARS-CoV-2 specific T-cell response has been associated with disease severity, immune memory and heterologous response to endemic coronaviruses. However, an integrative approach combining a comprehensive analysis of the quality of SARS-CoV-2 specific T-cell response with antibody levels in these three scenarios is needed.

METHODS

❖ Study groups.

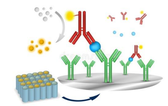


❖ Specific T-cell response:



❖ Multiparametric flow cytometry & ICS:
IFN-γ, IL-2, TNF-α, CD107a, Perforin (PRF).

❖ Quantification of anti-Spike specific IgG levels by ELISA.



RESULTS

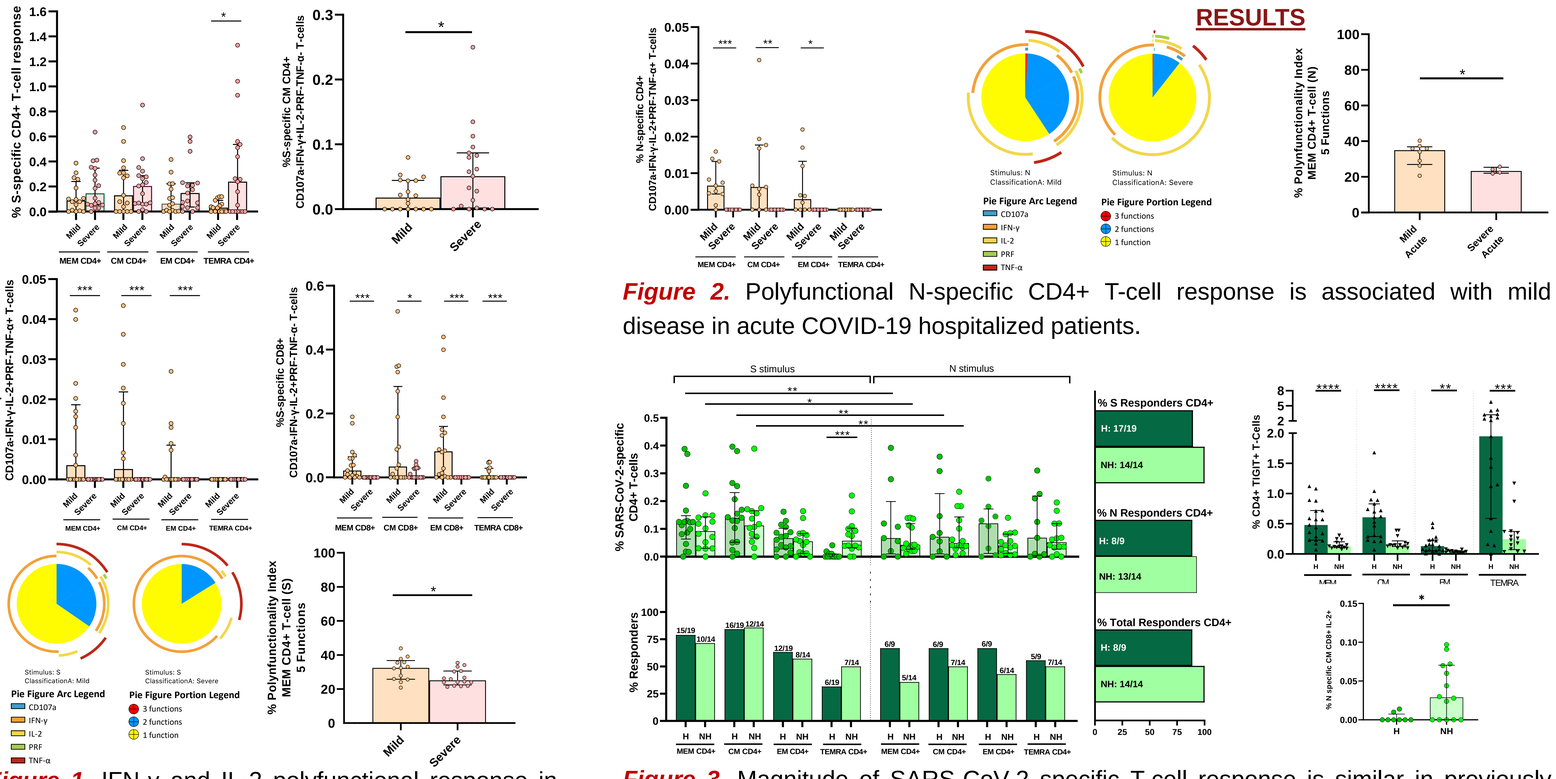


Figure 1. IFN-γ and IL-2 polyfunctional response in S-specific CD4+ T-cells are differentially associated with disease severity while IL-2 production in S-specific CD8+ T-cells is associated with mild disease.

Figure 2. Polyfunctional N-specific CD4+ T-cell response is associated with mild disease in acute COVID-19 hospitalized patients.

Figure 3. Magnitude of SARS-CoV-2 specific T-cell response is similar in previously hospitalized and non-hospitalized patients seven months after infection; TIGIT levels are higher in CD4+ T-cells from previously hospitalized patients and the production of IL-2 is higher in EM CD8+ T-cells from previously non-hospitalized patients.

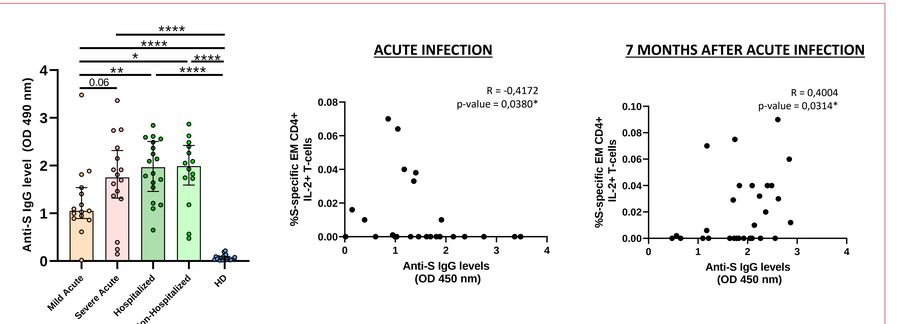


Figure 4. Anti-S IgG levels are associated with disease severity and differentially with SARS-CoV-2-specific T-cell response in acute and subjects seven months after infection

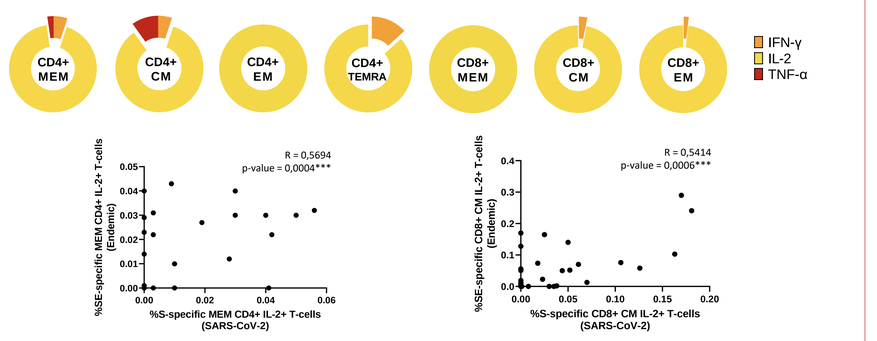


Figure 5. Monofunctional IL-2 expression in response to endemic coronaviruses prevailed in CD4+ and CD8+ T-cells respect to other cytokines and is associated with the magnitude and the quality of heterologous SARS-CoV-2 response.

CONCLUSIONS

In acute infection:

- Combinations with only IFN-γ+ were deleterious. Combinations with IL-2+ were associated with a better course of acute infection.
- Mild patients had a more polyfunctional T response. In severe patients there was increased antibody production inversely associated with the expression of combinations including IL-2.

Seven months after infection:

- Cellular and humoral responses were present, with T-cell response quality similar to acute infection.
- Previously hospitalized subjects had higher T-cell exhaustion.

In unexposed HD (pre-COVID samples) an association was found between the **response to HCoV** and SARS-CoV-2 mainly mediated by IL-2 expression.

ADDITIONAL KEY INFORMATION

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