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Introduction. Covid-19 patients (pts) with hematologic malignancies have a severe prognosis with mortality rates around 40%, particularly when on active treatment (Cattaneo et al, Cancer, in press). However, the long-term prognosis and persistence of specific immune responses among those who survive acute infection are unclear.

Aim: Pts with hematological diseases were followed longitudinally after the acute phase of COVID-19 according to protocol NP4156 approved by the local EC. Clinical outcome and specific antibody responses to SARS-CoV-2 were monitored during convalescence, and correlated to the diagnosis and treatment of the underlying hematological disease.

Pts and Methods. Pts affected by multiple myeloma (MM), follicular (FL) and diffuse large B-cell (DLC) lymphoma (NHL), chronic lymphoproliferative disorders (CLD), myelodysplastic/chronic myeloproliferative syndromes (MDS/MPN) and surviving the acute phase of virologic-proven COVID-19 were eligible. Immune response parameters were evaluated at +1, +3, +6, +9 and +12 months after nasal swab negativization. Antibodies (Ab) to different conformations of COVID-19 virus proteins, nucleocapsid (N)
and spike (S), were measured using a highly sensitive luciferase-immunoprecipitation system (LIPS) assay.

**Results.** Of 51 eligible pts, 41 were tested for SARS-CoV-2 Ab at first timepoint (+1m) (6 pts too early, 2 refusal, 2 lost to follow-up). For 9 of them, Ab levels at +3m were also available. Ab levels of 14 controls without hematologic disorders (Ctrls) also surviving COVID-19 were evaluable at +1m and in 9 of them at +3 months as well. Diagnoses included FL (9) and DLC (6) NHL, CLD (7), MM (10), MDS/MPS (9). The status of hematological disease at the time of COVID-19 diagnosis was as follows: diagnosis (n=4; 10%), complete or partial remission (n=16; 39%), relapse/refractory (n=6; 15%); stable (n=15; 36%). Twenty-one pts (51%) were on active treatment, including 6 on chemoimmunotherapy; 7 pts had received chemoimmunotherapy previously. Median time from SARS-CoV-2 detection to swab negativity was 30d (range 8-63), and was not influenced by sex, age, hematologic diagnosis, disease status, nor treatment received. Two pts, both affected by DLC secondary to FL, remained swab-positive at day 119+ and 123+.

At +1m, both N- and S- seropositivity rate was slightly lower in pts [N+ in 30/41 (73%); S+ in 27/41 (66%)] vs 13/14 for both N+ and S+ in Ctrls (93%) (P=0.16 and 0.08, respectively). Discrepancies between N and S seropositivity were observed in 7 (17%) pts, all with lymphoid disorders. Ab levels were similar in hematologic pts and in Ctrls (N+ 894,707 vs 870,541 LU and S+ 907,591 LU vs 724,120 LU, respectively, P=NS) (Fig.1a). Both seroconversion rates and Ab levels were not influenced by age, sex, status of hematologic disease, ongoing treatment, time to swab negativity, severity of pneumonia and steroid treatment during acute COVID-19. However, a diagnosis of NHL negatively impacted on seroconversion for both N and S. In 15 pts with NHL compared to 26 pts with other hematologic cancers, the N-seropositivity rate was 47% vs 92%, and the S-seropositivity rate was 40% vs 85% (P=0.002 and 0.0053, respectively). N and S Ab levels were also lower than in other hematologic diseases (515,281 LU vs 1105409 LU, P=.002 and 474,309 LU vs 1,148,303 LU, P=.005 respectively) (Fig.1b). Rituximab (RTX) had been used in 13 of 15 NHL (87%), and treatment was ongoing in 6/13. While N-seroconversion and Ab levels were not influenced, no pts on ongoing RTX had S-seroconversion vs 5/7 pts with past RTX use (P=0.021) and mean antibody levels were 17622 LU vs 668548 LU, respectively (P=0.008).

At +3m, no significant variations of both anti-N and anti-S antibody levels had occurred compared to timepoint +1m. Seroconversion status was maintained by 9/9 Ctrls and by 8/8 pts; the only pt with Ab levels below the cut-off at +1m did not show seroconversion at+3m.

**Conclusions:** Overall, hematologic pts surviving COVID-19 have N- and S- antibodies levels and seroconversion rates similar to controls without hematologic disorders, although time to swab negativity seems more similar to critically ill pts than in the general population. A diagnosis of NHL negatively impacts on seroconversion and Ab levels, and ongoing RTX seems to have a negative role specifically
on anti-S Ab production. Ab response persists at 3 months; the study is ongoing and further data will be available at time of meeting.

Disclosures

**Tucci:** *Amgen:* Consultancy. **Rossi:** *Pfizer:* Membership on an entity's Board of Directors or advisory committees; *Jazz:* Membership on an entity's Board of Directors or advisory committees; *Abbvie:* Membership on an entity's Board of Directors or advisory committees; *Alexion:* Membership on an entity's Board of Directors or advisory committees; *Sanofi:* Honoraria; *Amgen:* Honoraria; *Novartis:* Other: Advisory board; *Takeda:* Honoraria, Membership on an entity's Board of Directors or advisory committees; *Astellas:* Membership on an entity's Board of Directors or advisory committees; *Celgene:* Membership on an entity's Board of Directors or advisory committees; *Janssen:* Membership on an entity's Board of Directors or advisory committees; *Daiichi Sankyo:* Consultancy, Honoraria. **Imberti:** *Biogen:* Honoraria; *Genzyme-Sanofi:* Honoraria; *Meck-Serono:* Honoraria; *Novartis:* Honoraria; *Biogen:* Other: Advisory board; *FISM (Fondazione Italiana Sclerosi Multipla):* Research Funding; *Regione Lombardia:* Research Funding. **Notarangelo:** *NIAID, NIH:* Research Funding. **Cohen:** *NIAID, NIH:* Research Funding.

Author notes

* Asterisk with author names denotes non-ASH members.