P1593 IMMUNE BIOMARKERS TO PREDICT SARS-COV-2 VACCINE EFFECTIVENESS IN PATIENTS WITH HEMATOLOGICAL MALIGNANCIES

**Topic:** 30. Infections in hematology (incl. supportive care/therapy)

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**Background:** The great heterogeneity observed in the efficacy of vaccines for COVID-19 among hematological patients is probably associated with both therapy-related immunosuppression and disease-related immune dysregulation. We hypothesized that these features can be depicted in peripheral blood, and that immune profiling prior to vaccination can help predict immunogenicity.

**Aims:** Determine the immune landscape of patients with a mature B-cell and a plasma cell neoplasm prior to vaccination and its relationship with antibody response after two doses of SARS-CoV-2 vaccine.

**Methods:** We performed a comprehensive immunological characterization of 83 hematological patients before vaccination, and measured IgM, IgG and IgA antibody response to 4 viral antigens (RBD, S, N and Mpro) at day+7 after second-dose COVID-19 vaccination using multidimensional and computational flow cytometry. Health care practitioners (HCP) of similar age were the control group (n=102). Overall, 59 immune cell-types within the granulocytic, antigen presenting cell, T-cell and B-cell compartments, were systematically evaluated in peripheral blood of patients and HCP.

**Results:** When compared to HCP, 44 of the 59 (75%) immune cell-types were significantly altered in hematological patients; those with monoclonal gammopathies showed greater immunosuppression than patients with B-cell disorders and Hodgkin lymphoma. When comparing the relative distribution of the 59 immune cell-types to that of HCP, patients that were on and off-treatment showed more frequent alterations than those that were never treated (39/59 [66%], 33/59 [56%] and 20/59 [34%], respectively). Thus, immune dysregulation emerged before treatment (80%). The frequencies of 43 immune cell-types were significantly associated with immunogenicity. Lasso algorithm for logistic regression multivariate analysis: neutrophils, classical monocytes, CD4 and CD8 effector T cells, as well as naïve CD21+ and IgM+D+ memory B cells. On logistic regression multivariate analysis, the six immune cell-types and two clinical parameters (no prior therapy and anti-CD38 therapy) predicted immunogenicity independently of patient’s demographics and other clinical characteristics.

**Summary/Conclusion:** This comprehensive immunological characterization of hematological patients prior to vaccination and its relationship with antibody response after two doses of SARS-CoV-2 vaccine can help predict immunogenicity.

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vaccination exposed the extent of immunosuppression induced by anticancer treatment and uncovered that immune dysregulation is present before and persists after therapy. Our results translated into cutoffs for broad use of new immune biomarkers to predict antibody response after vaccine for COVID-19 in hematological patients. Our study urges reflection on whether immune profiling before boosting is warranted to identify optimal timing of vaccine boosters.