**155. Humoral and cellular SARS-CoV-2 vaccine responses in patients with Giant Cell Arteritis and Polymyalgia Rheumatica**

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**Background:** Giant cell arteritis (GCA) and polymyalgia rheumatica (PMR) are overlapping autoinflammatory diseases that target almost exclusively people over 50 years. The diseases are commonly treated with immunosuppressive drugs such as glucocorticoids (GCs), methotrexate (MTX), leflunomide (LEF) and tocilizumab (TCZ). The recent SARS-CoV-2 pandemic has had tremendous effects on these patients, both medically and psychologically. Even though the SARS-CoV-2 vaccines have proven to be overwhelmingly efficient in preventing severe disease in the general population, little is known about their effect on patients with GCA and PIn particular, the effect of their immunosuppressive medication may substantially hamper their vaccine responses. Therefore, the objective of this study is to assess effectiveness of SARS-CoV-2 vaccination in GCA and Ppatients, based on humoral and cellular immunity.

**Methods:** We investigated the effectiveness of COVID-19 vaccination in GCA and Ppatients participating in our prospective GPS cohort in the Netherlands. We assessed immune responses to COVID-19 vaccines that are part of the 2021 national vaccination program. Participants were requested to visit the outpatient clinic twice: pre-vaccination and 4 weeks post-vaccination. Patients with a previous SARS-CoV-2 infection were excluded. In both pre- and post-vaccination samples, antibody titers against the Spike protein were assessed using the Multiplex Immuno assay. Antibody titers of patients were compared to age-, sex- and vaccine-matched control groups. The frequency of Spike-specific T-cells was assessed by an IFN-γ ELIspot assay with pre- and post-vaccination samples.

**Results:** After exclusion, 46 GCA patients, 32 Ppatients and 98 controls participated in this study. The total GCA/Ppatient population did not have reduced antibody titers compared to the control groups (Figure 1). No differences were observed between GCA and Ppatients. However, a linear regression analysis revealed three factors that were significantly associated with lower antibody titers in GCA/Ppatients: the use of MTX, the use of >10mg GCs and the ChAdOx1 vaccine. Evidence of cellular immunity, as assessed by ELIspot assay, was found in 65% of GCA/Ppatients. Antibody titers correlated positively with spot counts, indicating reduced cellular immunity in patients with a hampered humoral vaccine response.

**Conclusions:** As a patient population, GCA/Ppatients do not have a reduced vaccine response compared to other elderly individuals. However, patients using MTX and high dose GCs did show lower antibody titers after vaccination, which corresponds with findings in other patient populations suffering from autoinflammatory diseases. These patients may therefore face a higher risk of (potentially even severe) breakthrough infections, particularly when the time since the vaccination becomes longer.

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**Figure 1*:*** *SASR-CoV-2 antibody titers in GCA and Ppatients after vaccination. In A, GCA/Ppatients are compared with age- and sex-matched controls. In B, GCA and Ppatients are compared. Data are expressed in BAU (binding antibody units).*

