Impact of Hypertension on Long-Term Humoral and Cellular Response to SARS-CoV-2 Infection

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Background: It was shown that hypertension delays SARS CoV-2 viral clearance and exacerbates airway hyper-inflammation in the respiratory tract. However, it is unknown whether hypertension determines the long-term cellular and humoral response to SARS CoV-2.

Methods: Health care workers (HCWs) after an outbreak of SARS CoV-2 infections were recruited. Two groups were analyzed, infected and fully vaccinated HCWs. Clinical data were recorded. Blood was drawn and the humoral and cellular immune responses were examined.

Results: 5-14 months (median 7 months) after detection of SARS CoV-2 infection, blood was taken to analyze humoral response (S1 IgG and SARS CoV-2 neutralizing antibodies) and cellular (T cell responses to SARS-CoV-2 with Lymphocyte Transformation Test). Infected hypertensive HCWs more often developed anosmia, myalgia and needed to be hospitalized as compared to non-hypertensive HCWs. The long-term humoral and cellular immune response was significantly strengthened in hypertensive versus normotensive infected HCWs. Multivariant regression analysis revealed that only hypertension but not age, BMI, sex, diabetes, smoking, COPD, asthma and time between PCR positivity and blood taking was independently associated with the humoral and cellular response to SARS-CoV-2 infection.

Conclusions: In conclusion, SARS CoV-2 infection strengthened humoral and cellular immune response to SARS CoV-2 infection in hypertensive HCWs independent of other risk factors and also severity of symptoms.