Platform Presentations

SP - Scientific Presentation - SP - Other (Other Medical Condition)

953 **PREVIOUS SARS-COV2 INFECTION, AGE AND FRAILTY PREDICT 6-MONTH BNT162B2 VACCINE-INDUCED ANTIBODY TITRE IN NURSING HOME RESIDENTS**

A. Dyer[1,2,3], C. Noonan[1], R. Pierpoint[1], A. Leonard[4,5], G. Boran[4,5], G. Brady[6], A. Fallon[1], C. O'Farrelly[7], N. Bourke[2,3,1,2,3]

[1] *Age-Related Healthcare, Tallaght University Hospital, Dublin, Ireland*
[2] *Inflammaging Research Group, Trinity College Dublin, Ireland*
[3] *Medical Gerontology, Trinity College Dublin, Ireland*
[4] *Clinical Chemistry and Laboratory Medicine, Tallaght University Hospital, Dublin, Ireland*
[5] *Clinical Biochemistry Unit, School of Medicine, Trinity College Dublin, Ireland*
[6] *linical Medicine, Trinity Translational Medicine Institute*
[7] *Comparative Immunology, Trinity College Dublin, Ireland*

Introduction: Older nursing home residents are the population at greatest risk of morbidity and mortality from SARS-CoV-2 infection. No studies have examined the determinants of long-term antibody responses post-vaccination in this group.

Method: Longitudinal cohort study in residents of 5 nursing homes assessed prior to vaccination and at both 5-weeks and 6-months post SARS-CoV2 vaccine (BNT162b2). Comprehensive clinical assessment was performed, including assessment for comorbidity, frailty (NH-FRAIL) and SARS-CoV-2 infection history. Serum Nucleocapsid and Anti-Spike Receptor Binding Domain (RBD) antibodies were analysed at all timepoints and an in vitro Angiotensin Converting Enzyme (ACE2) Receptor-Spike RBD neutralisation assay used to assess serum neutralisation capacity.

Results: Of 86 participants (81.1 ± 10.8 years; 65% female), just-under half (45.4%; 39/86) had evidence of previous SARS-CoV-2 infection. All participants demonstrated a significant antibody response to vaccination at 5-weeks and a significant decline in this response by 6-months. SARS-CoV-2 infection history was the strongest predictor of antibody titre (log-transformed) at both 5-weeks (β: 3.00; 95% CI [Confidence Interval]: 2.32, 3.70; $p < 0.001$) and 6-months (β: 3.59; 95% CI: 2.89, 4.28; $p < 0.001$). Independent of SARS-CoV-2 infection history, both age in years (β: -0.05; 95% CI: -0.08, -0.02; $p < 0.001$) and frailty (β: -0.22; 95% CI: -0.33, -0.11; $p < 0.001$) were associated with a lower antibody titre at 6-months. Antibody titres at both 5-weeks and 6-months significantly correlated with in vitro neutralisation capacity.

Conclusion and Implications: In older nursing home residents, SARS-CoV-2 infection history was the strongest predictor of anti-spike antibody titres at 6-months, whilst age and frailty were independently associated with lower titres at 6-months. Antibody titres significantly correlated with in vitro neutralisation capacity. Whilst older SARS-CoV-2 naïve nursing home residents may be particularly vulnerable to breakthrough SARS-CoV-2 infection, the relationship between antibody titres, SARS-CoV-2 infection and clinical outcomes remains to be fully elucidated in this cohort.