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"Impact of Social Determinants of Health on Biomarkers of Immune Function in Trauma"

Introduction: Social determinants of health (SDOH) are the "structural conditions in which people are born, grow, live, work, and age" (Marmot et al, 2008). SDOH have been shown to impact alcohol use, food security, depression, and most importantly stress. Since chronic stress and immune competency are closely related, it is important to understand how SDOH impact immune biomarkers. Although the impact of stress on immune function is clear in the general population, there is a gap in knowledge on the impact of SDOH on the ability of patients exposed to trauma to mount an effective immune response and facilitate recovery. We hypothesize patients with low SDOH (food insecurity, income strain, depression) to exhibit poorer clinical recovery, measured through immune biomarkers and physical therapy evaluations.

Methods: This was an observational retrospective cohort study. Information was gathered from deidentified data from Epic records of trauma patients hospitalized at Our Lady of the Lake in Baton Rouge between January 2018 and May 2024. Neutrophil-to-lymphocyte ratio (NLR) at admission was used as an assessment of immune function. Physical therapy evaluations considered include prior level of function, bed and functional mobility, gait, balance, and cognitive status. Data was analyzed in R using non-parametric Mann-U Whitney test comparing patients with SDOH and without SDOH. $P<0.05$ was considered significant.

Results and Conclusions: SDOH was not found to be significant in neutrophil-to-lymphocyte ratio ($p=0.85$). However, our violin plot shape is suggestive of possible significance with a more robust sample size. SDOH was found to be a significant factor on physical therapy measures like bed and transfer mobility (49% for negative SDOH and 16% for positive SDOH, $p=0.003$), independent prior level of function (84% versus 55%, $p=0.001$), and ability to communicate and follow commands on discharge (90% versus 64%, $p=0.003$). Future work will aim at not only improving surgical outcome prediction based on SDOH and immune function but also elucidating the molecular mechanisms behind this effect.