Immunosenescence and Social Exclusion

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BACKGROUND

Immunosenescence is a process of immune dysfunction that occurs with increasing age and results in increased susceptibility to infection, cancer and autoimmune diseases. An inversion of the normal CD4+: CD8+ T-cell ratio is one marker of immunosenescence. Lower socioeconomic status (SES) and minoritized racial status are associated with an increased risk of immunosenescence.

Some people living with HIV (PLWHIV) develop immunosenescence at a younger age than expected. Known risk factors for immunosenescence in PLWHIV include older age, treatment with thymidine analogues, and lower CD4+ T-cell nadir. We hypothesised that PLWHIV who have low SES and experienced social exclusion (homelessness, incarceration, injecting drug use) have a more marked inversion of CD4+: CD8+ T-cell ratio.

METHODS

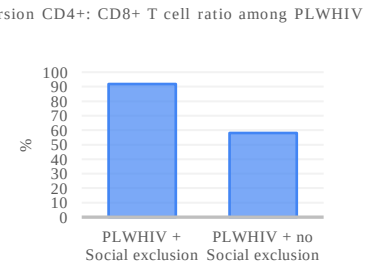
We performed a retrospective cross-sectional observational study using the electronic patient records of patients receiving HIV care at St. James's Hospital in Dublin, Ireland. 85 socially excluded PLWHIV were identified from referrals to the HIV Assertive Engagement Clinic. An additional 215 patients were selected randomly from a database of all patients with HIV attending SJH. Mann-Whitney and one-way ANOVA tests were used to test the significance of differences of the CD4/CD8 ratio between the control group and those that were considered socially excluded.

RESULTS

Demographics

85/300 PLWHIV had experienced social exclusion. Of these, 70/85 had experienced homelessness, 50/85 had injected drugs and 30/85 had been incarcerated.

The median age of the PLWHIV who had experienced social exclusion was 43 (range 25- 63) compared to 40 years (22-76) for those who had not experienced social exclusion..



The difference in CD4+:CD8+ T-cell ratio between groups was **statistically significant using Fisher's exact test.**

The mean CD4+:CD8+ T-cell ratio in PLWHIV who had experienced social exclusion was 0.57 compared to 0.97 in those who had not, this difference was statistically significant ($p<0.001$) when compared using a one-way ANOVA.

DISCUSSION

PLWHIV who have experienced social exclusion are more likely to have immunosenescence as defined by CD4+:CD8+ T-cell ratio to a greater degree than those who have not. They may be at higher risk of infection, cancer and earlier development of frailty. Potential mediators of the effect of social exclusion on the immune system include behaviours such as smoking and drug use, direct effects of psychosocial stress on the immune system through the sympathetic nervous system and/or the hypothalamic-pituitary-adrenal axis and/or environmental exposures. We plan to use multivariate regression analysis to examine the effect of some of these variables.

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