

Smoking Is Associated With Microbial Translocation in the Miami Adult Studies on HIV (MASH) Cohort

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Objectives: The prevalence of cigarette smoking is 2 to 3 times greater among people living with HIV (PLWH) than in the HIV uninfected population. Smoking has also been associated with deleterious effects on the gut leading to potential microbial translocation. Thus, we sought to use CD14 (sCD14) as a surrogate marker of microbial translocation to determine if smoking was associated with changes in microbial translocation.

Methods: A cross-sectional analysis was completed with participants from the Miami Adult Studies on HIV (MASH) cohort. Demographic characteristics and cigarette smoking status were self-reported. Levels of sCD14 were analyzed using ELISA kits in Dr. Sherman's laboratory. HIV serostatus and viral load (VL) were abstracted from medical records with the participants' consent. Statistical analyses included descriptive statistics, T-test, linear regression for sCD14 levels,

and logistic regression to calculate the odds of having an sCD14 level above the sample median (1064.3 ng/mL). All analyses were conducted on SPSS 26.

Results: A total of 470 participants were included in the analysis. The mean age was 53 ± 8 years, 42.8% were females and 64.5% were Black. PLWH accounted for 76.8% of participants and 85.1% had a suppressed VL (<50 copies/mL). Smokers had significantly higher mean sCD14 levels than non-smokers (1025.8 ± 429.0 vs. 1183.4 ± 465.7 , respectively; $P = 0.002$). This relationship remained significant after adjusting for sex, age, BMI, and HIV status ($\beta = 166.70$, $SE = 52.36$, $P = 0.002$). Also, smoking tended to be associated with 1.6 times the odds of having high sCD14 levels, adjusted for BMI, age, sex, and HIV status ($\beta = 1.6$, 95% CI = 1.0–2.6, $P = 0.051$).

Conclusions: Cigarette smoking appears to contribute to immune activation regardless of HIV status which may contribute to microbial translocation, regardless of HIV status. The findings provide further evidence of the deleterious effect of cigarette smoking on physiological functions, including gut health. Further research is needed to determine the long-term effects of smoking on immune activation and microbial translocation.

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