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Heroin Use Severity is not Associated with Telomere Length in Individuals with Opioid Use Disorder of African Ancestry

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Background: Reduced telomere length (TL) may serve as a biomarker of accelerated epigenetic aging. The aim of this study was to assess the relationship between TL shortening and the severity of illicit opioid use.

Methods: DNA was isolated from illicit opioid users of African ancestry. Quantitative polymerase chain reaction (qPCR) was used to calculate TL as the ratio between telomere repeat copy number and a single-copy gene, copy number. Average telomere length (ATL) was estimated in kilobase pairs (kbp). A stepwise regression was used to identify associations between ATL and illicit opioid-use characteristics (years of use, daily use amount in “bags”) and drug use severity [Addiction Severity Index (ASI) Drug Composite Score (range: 0-1), Drug Abuse Screening Test (DAST-10; range: 0-10)].

Results: ATL [6.89 (\pm 0.76) kbp] was calculated from 64 participants (20% women) who reported heroin as their drug of choice. Age [mean= 48.6 (\pm 6.7 yrs)] was significantly associated with ATL ($r = -.38$, $p = 0.002$), and the only variable retained in the final regression model ($F= 7.72$, $p = 0.008$). ATL was not significantly associated with years of heroin use [mean = 18.1 (\pm 10.6), $p = 0.182$], daily heroin use [bags/day = 6.4 (\pm 6.1), $p = 0.128$], DAST-10 score [mean = 7.0 (\pm 2.6), $p = 0.341$], or ASI Score [mean = 0.33 (\pm 0.19) $p = 0.145$].

Discussion: This study found no evidence of a quantitative relationship between illicit opioid use severity and TL. A case-control analysis may determine the degree of accelerated epigenetic aging attributable to heroin use.

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