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Drug Repurposing for the prevention of dementia among people living with human immunodeficiency virus: A focus on the renin-angiotensin system

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We applied AI-based biomedical literature mining system to determine the genes associated with HIV- related cognitive decline and dementia. The high-ranked genes were related to renin-angiotensin system. Therefore, we sought to determine the effects (signals) of angiotensin-converting enzyme inhibitors on dementia among people living with HIV (PLWH) by data mining a large, longitudinal medical record database. This retrospective cohort data science study was conducted using data from the US Department of Veterans Affairs. The Veterans Affairs Informatics and Computing Infrastructure was utilized to obtain individual-level information on demographics, administrative claims, and pharmacy dispensation. The study utilized a cohort of PLWH stratified according to the pharmacy dispensation of angiotensin-converting enzyme inhibitors (ACEi) on blood brain barrier (BBB) distribution capability (ACEi BBB compared to ACEi noBBB). Electronic health medical records were evaluated, and the study outcome was the development of dementia. At one year and 5 years, the ACEi BBB cohort had a lower rate of dementia compared to the ACEi noBBB cohort. A sub-analysis further evaluated the incidence of dementia among PLWH and also having a past medical history of substance abuse disorder. The results were consistent with the primary outcomes. Patients in the ACEi BBB cohort had a lower rate of dementia at five years compared to the ACEi noBBB cohort. This research suggests a possible positive link between blood-brain barrier crossing renin-angiotensin drugs and the dementia. The type of ACEi medication and its ability to cross the blood-brain barrier may influence later cognitive function.