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A risk score for chronic kidney disease can inform choice of HIV medications

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Both traditional and HIV-related risk factors can predict the likelihood of developing chronic kidney disease (CKD), according to a study published this week in *PLOS Medicine*. In the study, Amanda Mocroft, of University College London, United Kingdom, and colleagues developed and validated a risk score model that can help inform choices among antiretroviral drugs for patients with HIV.

Antiretroviral therapy can help control HIV, extending the life expectancy of those with the virus. However, some antiretroviral drugs may be nephrotoxic (harmful to the kidney), increasing the risk of CKD. Mocroft and colleagues used clinical and demographic data from 17,954 HIV-positive individuals enrolled in the Data Collection on Adverse Events of Anti-HIV Drugs (D:A:D) study to develop a CKD risk score model based on nine factors (age, intravenous drug use, hepatitis C co-infection, estimated glomerular filtration rate (a measure of kidney function), gender, nadir CD4 count (a measure of severity of immune system damage prior to treatment for HIV), hypertension, diabetes, and cardiovascular disease). They found that study participants with characteristics that resulted in a low risk score had a 1 in 393 chance of developing CKD in the following five years, while participants with medium and high risk scores had a 1 in 47 and 1 in 6 chance, respectively, of developing CKD. The researchers were also able to determine the added risk of using potentially nephrotoxic antiretroviral drugs.

For an additional patient to develop CKD within five years, the number

of patients in the low risk group that would have to be treated with the antiretroviral drugs tenofovir, atazanavir/ritonavir, or another boosted (combined with ritonavir to increase blood levels) protease inhibitor (not including lopinavir/ritonavir) was 739. That "number needed to harm" (NNTH) was 88 and 9 in the medium and high risk groups, respectively. Treatment with unboosted atazanavir, or lopinavir/ritonavir added less potential harm, resulting in higher NNTH: 1702, 202, and 21 for the low, medium and high risk groups. The researchers validated this risk score using two independent HIV study groups, but note that they were not able to fully incorporate data on race, or include data on the presence of protein in urine (a common screening test for kidney injury) into the model.

The authors say this risk score "has direct clinical relevance for patients and clinicians to weigh the benefits of certain antiretrovirals against the risk of CKD, and to identify those at greatest risk of CKD." A tool for calculating risk using their model is available online http://hivpv.org/Home/Tools/ChronicKidneyDiseaseTool.aspx.

More information: Mocroft A, Lundgren JD, Ross M, Law M, Reiss P, Kirk O, et al. (2015) Development and Validation of a Risk Score for Chronic Kidney Disease in HIV Infection Using Prospective Cohort Data from the D:A:D Study. *PLoS Med* 12(3): e1001809. DOI: 10.1371/journal.pmed.1001809

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