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## Coinfection with hepatitis C virus, oxidative stress and antioxidant status in HIV-positive drug users in Miami.

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### Abstract

**Background** The pathogenesis of HIV/hepatitis C virus (HCV) coinfection is poorly understood. We examined markers of oxidative stress, plasma antioxidants and liver disease in HIV/HCV-coinfected and HIV-monoinfected adults. **Methods** Demographics, medical history, and proof of infection with HIV, hepatitis A virus (HAV), hepatitis B virus (HBV) and HCV were obtained. HIV viral load, CD4 cell count, complete blood count (CBC), complete metabolic panel, lipid profile, and plasma concentrations of zinc, selenium, and vitamins A and E were determined. Malondialdehyde (MDA) and glutathione peroxidase concentrations were obtained as measures of oxidative stress. Aminotransferase to platelet ratio index (APRI) and fibrosis index (FIB-4) markers were calculated. **Results** Significant differences were found between HIV/HCV-coinfected and HIV-monoinfected participants in levels of alanine aminotransferase (ALT) (mean $\pm$ standard deviation: 51.4 $\pm$ 50.6 vs. 31.9 $\pm$ 43.1 U/L, respectively;  $P=0.014$ ), aspartate aminotransferase (AST) (56.2 $\pm$ 40.9 vs. 34.4 $\pm$ 30.2 U/L;  $P<0.001$ ), APRI (0.52 $\pm$ 0.37 vs. 0.255 $\pm$ 0.145;  $P=0.0001$ ), FIB-4 (1.64 $\pm$ 0.91 vs. 1.03 $\pm$ 0.11;  $P=0.0015$ ) and plasma albumin (3.74 $\pm$ 0.65 vs. 3.94 $\pm$ 0.52 g/dL;  $P=0.038$ ). There were no significant differences in CD4 cell count, HIV viral load or antiretroviral therapy (ART) between groups. Mean MDA was significantly higher (1.897 $\pm$ 0.835 vs. 1.344 $\pm$ 0.223 nmol/mL, respectively;  $P=0.006$ ) and plasma antioxidant concentrations were significantly lower [vitamin A, 39.5  $\pm$  14.1 vs. 52.4 $\pm$ 16.2 mug/dL, respectively ( $P=0.0004$ ); vitamin E, 8.29 $\pm$ 2.1 vs. 9.89 $\pm$ 4.5 mug/mL ( $P=0.043$ ); zinc, 0.61 $\pm$ 0.14 vs. 0.67 $\pm$ 0.15 mg/L ( $P=0.016$ )] in the HIV/HCV-coinfected participants than in the HIV-monoinfected participants, and these differences remained significant after adjusting for age, gender, CD4 cell count, HIV viral load, injecting drug use and race. There were no significant differences in glutathione peroxidase concentration, selenium concentration, body mass index (BMI), alcohol use or tobacco use between groups. Glutathione peroxidase concentration significantly increased as liver disease advanced, as measured by APRI ( $\beta=0.00118$ ;  $P=0.0082$ ) and FIB-4 ( $\beta=0.0029$ ;  $P=0.0177$ ). Vitamin A concentration significantly decreased ( $\beta=-0.00581$ ;  $P=0.0417$ ) as APRI increased. **Conclusion** HIV/HCV coinfection is associated with increased oxidative stress and decreased plasma antioxidant concentrations compared with HIV monoinfection. Research is needed to determine whether antioxidant supplementation delays liver disease in HIV/HCV coinfection.

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