Seroconversion Rates Among Healthcare Workers Exposed to Human Immunodeficiency Virus and Hepatitis C-Contaminated Body Fluids: The University of Pittsburgh Experience

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BACKGROUND: Human Immunodeficiency Virus (HIV) and hepatitis C virus (HCV) transmission to healthcare personnel (HCP) following percutaneous exposure to the blood of a source patient, has been reported to occur at an average rate of 0.3% (0.2-0.5%)[1] and 1.8% (range 0-10%),[1,2] respectively. Most of this data is either outdated or was from predominantly non-US centers. We aimed to determine the seroconversion rate after exposure to HIV or HCV-contaminated body fluid at a major academic medical center in the US.

METHODS: A longitudinal analysis of a prospectively maintained database of reported occupational injuries occurring between 2002 and 2015 at the University of Pittsburgh Medical Center was performed. Inclusion criteria included HCP who sustained needlestick, laceration, or splash injuries from known HIV or HCV-positive patients. Exclusion criteria included missing data (on the type of injury and fluids), and a positive HIV or HCV status of the HCP. Data collected included the type of injury, injured body part, type of fluid, contamination of sharps, and patients' HIV and HCV status. Univariate and bivariate statistical analyses were performed using SPSS statistical software (version 19.0; SPSS Inc., Chicago, IL, USA).

RESULTS: 1,627 cases (HIV=266, HCV=1,361) were included in the study. The majority of the cases were due to percutaneous injuries (HIV=52.6%, HCV=65.0%) as opposed to mucocutaneous injuries (HIV=43.2%, HCV=33.7%), and the majority of injuries occurred in the hand (HIV=52.6%, HCV=63.3%). Blood exposure accounted for 64.3% (HIV) and 72.7% (HCV) of cases, saliva for 5.6% (HIV) and 3.4% (HCV), and other fluids for 13.6% (HIV) and 11% (HCV). The seroconversion rate was calculated at 0% after a mucocutaneous exposure to either HIV- or HCV-contaminated body fluid, but was 0% (n=0) for HIV and 0.2% (n=2) for HCV, after a percutaneous exposure. The two seroconverted cases were secondary to blood exposure via percutaneous injuries.

CONCLUSION: This study provides the most recent data from a major US academic medical center. The seroconversion rates among HCP exposed to HIV and HCV-contaminated body fluids (0% and 0.2% respectively), were found to be lower than most of the data found in the literature. HIV and HCV do not seem to be easily transmitted by needlestick, laceration, or splash injuries. However, further large-scale studies are needed for a more accurate estimation of the risk of transmission.

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