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Hepatitis C virus and human immunodeficiency virus transmission routes: Differences and similarities

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Abstract

Bouare *et al* found that hepatitis C virus (HCV) infection in Malian women is mainly transmitted through medical procedures with contaminated supplies, and that human immunodeficiency virus (HIV) transmission is predominantly sexual. The results of this study confirm those of a recent case-control study in New York and Oregon which demonstrated that healthcare exposures represent an important source of new HCV infections in United States. HCV seroprevalence was only 0.2% in pregnant, young Malian women, indicating that hygiene improved in healthcare facilities over time. Heterosexual transmission of HCV is exceptional, and can occur, from males to females, in extremely rare occasions in case of vaginal mucosal damage or less rarely through anal intercourse. The Malian study did not show an association between HIV infection and hospitalization, transfusion, tattoo, dental care. Transmission by needle-stick injury occurs in 0.9%-2.2% of exposures from HCV-infected subjects and in 0.1%-0.3% of exposures from HIV-infected individuals. HCV is therefore more transmissible through percutaneous exposure.

Key words: Hepatitis C virus; Human immunodeficiency virus; Transmission; Sub-Saharan Africa; Pregnant women

Core tip: The results of a number of studies have shown that hepatitis C virus (HCV) infection is mainly transmitted through medical procedures with contaminated supplies, whereas human immunodeficiency virus (HIV) transmission is predominantly sexual. Heterosexual transmission of HCV is exceptional and can occur, from males to females, in extremely rare occasions in case of vaginal mucosal damage or less rarely through anal intercourse. Transmission by needle-stick injury occurs in 0.9%-2.2% of exposures from HCV-infected subjects and in 0.1%-0.3% of exposures from HIV-infected individuals; therefore HCV is more transmissible through percutaneous exposure.

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COMMENTARY ON HOT TOPICS

Bouare *et al*[1], studying 1000 pregnant women in six reference health centers, and 231 older women who attended general practice in two hospitals in Mali, found that hepatitis C virus (HCV) infection is mainly transmitted through medical procedures with contaminated supplies rather than through blood transfusion, whereas human immunodeficiency virus (HIV) transmission is predominantly sexual.

The results of this study confirm those of a very recent case-control study done in three health departments that performed enhanced viral hepatitis surveillance in New York and Oregon and included reported cases of symptomatic acute hepatitis B and hepatitis C

occurring in persons ⩾ 55 years of age from 2006 to 2008; healthcare exposures were found to represent an important source of new HBV and HCV infections in United States[2]. Many other studies also found the same in different countries[3-6]. It is reassuring that HCV seroprevalence was only 0.2% in pregnant (young) Malian women[1], possibly indicating that hygiene improved in healthcare facilities over time. The results also confirm that heterosexual transmission of HCV is exceptional[7-10]. Indeed heterosexual transmission of HCV from males to females can occur in extremely rare occasions in case of vaginal mucosal damage[11] or less rarely through anal intercourse[12,13].

What about HIV? The Malian study did not show an association between HIV infection and hospitalization, transfusion, tattoo, dental care. A significant decrease of HIV seroprevalence was detected in young women who used condoms for contraception more than for other purposes, whereas surprisingly HIV seroprevalence was significantly increased in young women using condoms mainly to prevent sexual infections[1]. The authors interpreted these findings as suggestive of awareness of transmission and prevention of HIV infection only after contagion. However knowledge of vaginal sex as an HIV transmission risk and condom use as an HIV prevention strategy were associated with a higher likelihood of HIV infection in Mozambique and elsewhere in sub-Saharan Africa[14], inconsistent condom use was not related to the probability of HIV transmission per coital act in a study of Ugandan HIV discordant couples[15], and condom use was not negatively associated with incident HIV infection in a large study conducted in Benin, Ghana, India, Nigeria, and South Africa[16]. At least the latter of these surprising findings are likely to derive from the inaccuracy of self-reported data[17].

Transmission by needle-stick injury occurs in 0.9%-2.2% of exposures from HCV-infected subjects[18,19] and in 0.1%-0.3% of exposures from HIV-infected individuals[20]; therefore HCV is more transmissible through percutaneous exposure. It has not been definitively established why HCV is much less transmissible than HIV by heterosexual contact, and more infectious through parenteral exposure. Although low infectivity of HCV by vaginal intercourse has been related to low titres in genital secretions, titres of free HIV are also low. It may be that as infection of tissue dendritic DC-SIGN(+)-DC cells and localised replication in cervico-vaginal tissues are of fundamental importance for HIV infection of exposed individuals[21], the lack of target cells in the genital tract may prevent infection by HCV through vaginal intercourse.

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