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## Low risk of sexual transmission of hepatitis C virus in Somalia

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### Abstract

The prevalence in Somalia of antibody to hepatitis C virus (anti-HCV) was determined in a survey of 236 female prostitutes, 80 sexually transmitted disease (STD) clinic patients, 79 male soldiers, and 43 tuberculosis patients. Of 98 (22%) serum samples repeatedly anti-HCV reactive by first and second generation enzyme-linked immunosorbent assay kits, only 8 (1.8%) were anti-HCV positive by immunoblot assay (RIBA-2). Anti-HCV seropositivity by immunoblot assay was not associated with any risk group or with positive syphilis serology (found in 18% of subjects) or antibody to human immunodeficiency virus 1 (in 1.4% of subjects). These data indicate that sexual transmission of hepatitis C virus is not common in Somalia among sexually active populations, including female prostitutes and other groups at high risk of STDs and the acquired immune deficiency syndrome.

### Introduction

Hepatitis C virus (HCV) has been found in developed countries to be a common cause of post-transfusion hepatitis and a common infection among groups with frequent parenteral exposure, such as illicit drug abusers (ALTER *et al.*, 1989a; ESTEBAN *et al.*, 1990; VAN DEN HOEK *et al.*, 1990). The role of sexual transmission in the spread of HCV is not as well understood, particularly in developing countries, although HCV does not seem to be transmitted by sexual contact as easily as hepatitis B virus (ALTER *et al.*, 1989b; EVERHART *et al.*, 1990).

In developing countries, HCV infection has not been found as frequently as hepatitis B infection; however, high-risk groups in these countries have not been comprehensively evaluated (AL-FALEH *et al.*, 1991; JACKSON *et al.*, 1991; SAEED *et al.*, 1991). In this investigation, populations living in Somalia and at high risk of sexually transmitted diseases (STDs) and human immunodeficiency virus (HIV) infection were investigated for HCV infection.

### Patients and Methods

During 1990, the Somali Ministry of Health surveyed 438 subjects living in 3 major urban centres in Somalia: Mogadishu, Merca, and Chismayu. Subjects included 236 female prostitutes, 80 STD patients (69% male), 79 male military personnel, and 43 patients (58% male) with *Mycobacterium tuberculosis* infection. The mean age of the entire population was 28 years (range 13-79 years). All subjects were chosen sequentially during clinic or hospital visits on the days that the study was conducted; no selection criterion was used.

A serum sample was obtained from all study subjects and tested for total anti-HCV antibody using both first and second generation commercial enzyme-linked immunosorbent assay (ELISA) kits (Abbott Laboratories, Abbott Park, Illinois, USA). Repeatedly reactive sera were further verified with a second-generation immunoblot assay (RIBA-2<sup>®</sup>; Chiron Corporation, Emeryville, California, USA). Sera reactive by both ELISA and RIBA-2 were considered to be positive for anti-HCV and to represent active infection (FOLLETT *et al.*, 1991). Sera were also screened for HIV-1 antibody by ELISA, and repeatedly reactive samples were confirmed by Western blotting. Lastly, sera were tested for syphilis infection by the rapid plasma reagin card test, with confirmation by the fluorescent treponemal antibody-absorption test (FTA-ABS).

### Results

Among 438 study subjects, 83 (18.9%) had serum samples repeatedly reactive for anti-HCV by first-generation ELISA. By second generation ELISA, 74 (16.9%) sera were repeatedly reactive for anti-HCV: 59 serum samples

which were also reactive by first-generation assay and 15 additional sera which were negative by first-generation ELISA. Among all 98 repeatedly ELISA-reactive sera, only 8 (1.8%) were anti-HCV positive and 6 (1.4%) were indeterminate by RIBA-2. All 8 RIBA-positive sera were identified by the second generation ELISA; however, 4 of the 8 were missed by the first-generation ELISA. Sera from 79 subjects (18.0%) were positive by FTA-ABS and 6 (1.4%) were positive for HIV-1 antibody by Western blotting.

There was no significant association between HCV infection, determined by RIBA-2, and the age, sex, or risk group of study subjects (Table). The mean age of the 8

Table. Prevalence of antibodies to hepatitis C virus and human immunodeficiency virus 1, and positive syphilis serology, among 438 subjects living in Somalia and at high risk of sexually transmitted diseases and AIDS

Risk group	No. examined	Number positive (percentages in parentheses)		
		Anti-HCV <sup>a</sup>	Anti-HIV-1 <sup>b</sup>	FTA-ABS <sup>c</sup>
Female prostitutes	236	4 (1.7)	5 (2.1)	73 (30.9)
STD clinic patients	80	2 (2.5)	0 (-)	3 (3.8)
Military personnel	79	1 (1.3)	1 (1.3)	3 (3.8)
Tuberculosis patients	43	1 (2.3)	0 (-)	0 (-)

<sup>a</sup>Immunoblot for anti-hepatitis C antibody.

<sup>b</sup>Western blot for human immunodeficiency virus 1.

<sup>c</sup>Fluorescent treponemal antibody absorption test.

subjects positive for anti-HCV was 32 years, compared to a mean age of 28 years for the other study subjects. None of the anti-HCV positive subjects had HIV-1 antibody, and only 3 of 8 subjects with anti-HCV were FTA-ABS positive.

### Discussion

Based on currently available tests for anti-HCV, these data indicate that sexual transmission of HCV is not common in Somalia among sexually active populations, including female prostitutes and individuals with anti-HIV-1 antibody and positive syphilis serology. A low risk of HCV infection has been found in other prostitute populations in developing countries, suggesting that HCV is not readily transmitted by sexual contact even among highly sexually active groups (HYAMS *et al.*, 1992).

These data also indicate that false-positive anti-HCV ELISA serological results are common in the Somali population and that the second generation ELISA assay is much better than the first generation assay for identifying immunoblot positive sera. Other studies of African populations have found a high prevalence of false-positive anti-HCV ELISA results, which has been attributed to malaria or flavivirus infection, cross-reactive antibody to unknown antigens, and infection by HCV variants (ACETI

et al., 1990; WONG et al., 1990; CHAN et al., 1991; ELLIS et al., 1991; JACKSON et al., 1991; TIBBS et al., 1991; HYAMS et al., 1993).

Our results suggest that HIV-1 infection was not common in Somalia at the time this study was conducted. A prior study in Somalia indicated that HIV-1 infection was not then widespread in that region, possibly because of minimal commerce between Somalia and the rest of Africa (SCOTT et al., 1991).

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