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SEROPREVALENCE OF HEPATITIS B AND C VIRUSES AMONG WOMEN OF CHILDBEARING AGE IN MOSHI URBAN, TANZANIA

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ABSTRACT

Objectives: **To describe the seroprevalence of hepatitis C and B viruses and their association with HIV and other sexually transmitted diseases (STDs) among women aged 15-49 years, attending primary health care clinics in Moshi urban, Tanzania.**

Design: **A cross-sectional study.**

Setting: **Three primary health care clinics in Moshi, Tanzania.**

Subjects: **A total of 382 consenting women attending reproductive and child health clinics between September-December 1999.**

Results: **The seroprevalence of anti-HCV was 1.0%, for HBsAg 4.2% and for HIV 11.5%. HIV infection and other sexually transmitted diseases were not associated with anti-HCV or HBsAg. There was no interrelation between HCV and HBV markers.**

Conclusion: **Hepatitis C Virus infection is infrequent among women in urban Tanzania. HCV and HBsAg were not more prevalent in HIV-infected women. Public preventive efforts should thus focus on hepatitis B virus immunisation.**

INTRODUCTION

Chronic liver disease and primary hepatocellular carcinoma are among the five leading causes of death by cancer among adults in many developing countries (1). Hepatitis B and C viruses are becoming the main causes of cirrhosis and primary liver carcinoma (1,2). In high endemic areas, hepatitis B virus (HBV) is mainly transmitted vertically or during early childhood, while in low endemic areas sexual contact with high-risk adults or injecting drug use are the predominant modes of transmission (1). The risk of hepatitis C virus (HCV) infection following parenteral exposure is well documented, however the role of sexual or vertical transmission is still not clear (2).

Recently, co-infection between the HCV and HIV virus have been associated with rapid decline in the CD4 count, rapid progression of HIV infection, and with increased morbidity and mortality (3). HIV adversely affects all stages of hepatitis C infection leading to increased viral persistence and accelerated progression of HCV-related liver disease. Individuals co-infected with HIV and HBV are more likely to develop chronic hepatitis B and are at increased risk for liver-related mortality (4). Hence the need for epidemiological data on the prevalence and correlates of HCV and HBV among women in areas with a high prevalence of HIV, like Tanzania, given that more than 55% of HIV infected persons in Tanzania are women (5).

In this study we describe the seroprevalence of HBsAg and antibody to HCV virus among women attending primary health care (PHC) clinics in Moshi urban district, northern Tanzania. The association

between HBV and HCV viral markers with HIV, and STDs were also evaluated.

MATERIALS AND METHODS

After obtaining ethical approval from the Tanzanian Ministry of Health and the Norwegian Ethical Committee, a cross-sectional study was conducted in September-December 1999, among women attending three government primary health care clinics in Moshi, Tanzania. Methods are explained in detail elsewhere (6). Three hundred and ninety two women attending the clinics for routine antenatal care, family planning or for immunisation of children, in that period were invited to participate. Ten declined and 382 agreed to participate. They were interviewed to collect information on socio-demographic variables, medical history, sexual practices and behaviours and on past experience on STDs. Pelvic examination was then performed on 378 women, three declined and one had advanced cancer of the cervix. Ten millilitres of venous blood was collected from each of the 382 participants.

Hepatitis B surface antigen (HBsAg) and antibody to HCV (anti-HCV) were detected by enzyme immunoassay (Abbott Laboratories, Abbott Park, IL, USA). Anti-HCV positive samples were confirmed by western blot (Murex Diagnostics, England). HIV antibodies were detected by using Determine HIV1/2 (Abbott Laboratories). Positive results were confirmed by the ELISA test (Murex Diagnostics, Dartford, UK). HSV-2 antibodies were detected by using type specific ELISA (Meridian Laboratories, Cincinnati, OH). Positive treponemal antibody determine test (Abbott Laboratories) and rapid plasma regain (RPR) together were interpreted as indicative of active syphilis. Microscopy was used to detect *Trichomanas vaginalis*. Endocervical specimens were used for detection of *Neisseria gonorrhoea* by culture and *Chlamydia trachomatis* by antigen detection (Abbott Laboratories).

Table 1

Association of HBsAg and HCV antibodies with demographic and laboratory confirmed STDs among 382 women in urban Tanzania

		HBsAg			anti-HCV		
Variable	No.	No.	(%)	P-value	No.	(%)	P-value
Age							
- 24 years	159	10	(6.3)		1	(0.6)	
> 24 years	223	6	(2.7)	0.08	3	(1.3)	0.64
HIV positive							
Negative	338	14	(4.1)		3	(0.9)	
Positive	44	2	(4.5)	0.90	1	(2.3)	0.39
HSV-2							
Negative	233	10	(4.3)		3	(1.3)	
Positive	149	6	(4.0)	0.90	1	(0.7)	0.56
Syphilis							
Negative	366	16	(4.4)		4	(1.1)	
Positive	16	0	(0.0)	–	0	(0.0)	–
CT/GC cervicitist*							
Negative	366	16	(4.4)		4	(1.1)	
Positive	12	0	(0.0)	–	0	(0.0)	–
Trichomoniasis*							
Negative	298	13	(4.4)		4	(1.3)	
Positive	80	3	(3.8)	0.81	0	(0.0)	–

CT = Chlamydia; GC = Gonococcal; * Total not 382 because four did not undergo pelvic examination

The SPSS-9 statistical package was used to analyse the data.

RESULTS

The mean age of the women (n = 382) was 26.6 years (range 16-46). The majority were married (93%), had - 7 years of education (91%), and were not formally employed (89%). A history of intramuscular injection in the past five years was high *(95%)* but low for blood transfusion (4%), however, none of these were associated with anti-HCV or HBsAg.

Four of the women tested positive for anti-HCV (1.0 %), 16 for HBsAg (4.2 %), *44* for HIV *(11.5%)*, 149 for HSV-2 (39%) and 16 for syphilis (4.2%). None of the women had both anti-HCV and HBsAg. HIV-seropositivity was not associated with either antiHCV (OR 2.6 95% CI 0.3-25.5) or HBsAg (OR 1.1 95% CI 0.2-5.0), (Table 1). HBsAg and anti-HCV were not statistically significantly associated with any viral or bacterial STD, (Table 1), nor were they associated with any marker of sexual behaviour.

HBsAg was positively though not significantly higher in women - 24 years (6.3%) vs in those > 24 years (2.7%); (AOR 2.43 95% CI 0.9-6.9). None of the other factors investigated, such as previous history of blood transfusion, tattooing/ear piercing, injections, religious affiliation, education, occupation, marital status, history of stillbirth or abortion, age of sexual debut, number of sexual partners, casual partners, condom use, history of treatment for STDs, presence of genital symptoms or partners age and education were associated with markers for HBV or HCV viruses.

DISCUSSION

A low prevalence of HCV (1.0%) was found among women of childbearing age in urban Tanzania, similar to that reported for pregnant women in Southern Tanzania (2.3%) and women of childbearing age in Ivory Coast (3%) (7,8). However it was lower than in rural Malawian pregnant women (16.5%) and among STD patients in India (21.1%) (9,10). Our findings might be partly explained by the low frequency of blood transfusion (4%), absence of injecting drug use among women and use of disposable syringes at the primary health clinics in Moshi urban since the late 90's.

Chronic carriage of HBV (HBsAg positive) of 4.2%, was lower than reports of pregnant women (6.3%), and blood donors (11%) in Tanzania or women in Malawi (13%) and West Africa (10%) respectively (7-9, 11). HBsAg carriage was also found to be lower in older women (> 24 years). This may suggest that, in this area, the pool of susceptible individuals for HBV beyond puberty is small and exposure to HBV may have occurred when most of the women were young children. However, because anti-HBc or anti-HBc IgM were not tested due to financial constraints, this limits our ability to distinguish between prolonged carriage of HBsAg or recently acquired infection.

In this study, dual infection with HCV and HBsAg was rare (8, 9). The lack of association between HBsAg with STDs or HIV contradicts the results from Mwanza, Tanzania where HBsAg was associated with trichomoniasis and syphilis or among blood donors in Dar es Salaam where HBsAg was associated with HIV (11, 12). HCV was also not associated with STDs or sexual behaviour contrary to what was observed by researchers in India and USA (2, 10). In those studies, the presence of one of the serological markers for syphilis, HIV, and/or genital ulcer increased the likelihood of having HCV (2, 10). The small number of women infected with viral hepatitis in this study, may limit conclusions to be drawn on the role of HIV/STDs co-infections with HCV.

In conclusion, HCV was infrequent among women of reproductive age in the area. The majority of chronic liver disease in the area may thus be related to hepatitis B virus, and public preventive efforts should focus on HBV, especially on the immunization programmes in early childhood. Since blood is not routinely screened for HCV in Tanzania, periodic sero-surveys for hepatitis C should be done to monitor the trend of this infection over time and understand its epidemiology.

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