

Prevalence of Hepatitis C virus antibodies among intravenous drug abusers and prostitutes in Damascus, Syria

Basem M. Othman, MSc, Fawza S. Monem, PhD.

ABSTRACT

Objective: In studies of risk factors among patients presenting with acute and chronic hepatitis C, a history of intravenous drug use is the most common finding, accounting for 40% or more of subjects. The prevalence of anti-hepatitis C virus antibodies among intravenous drug users is considered one of the highest numbers among high risk groups. Whether hepatitis C virus is transmitted efficiently or at all via sexual contact remains controversial. Therefore, the prevalence of hepatitis C virus antibodies among a group of Syrian intravenous drug users, prostitutes, and blood donors was studied.

Methods: The prevalence of anti-hepatitis C virus in a population of 38 Syrian intravenous drug abusers, 102 Syrian prostitutes, and 2100 blood donors, was carried out in the laboratory of Al-Assad University Hospital, Damascus, Syria. Antibodies of hepatitis C virus were studied by 3rd generation enzyme immunoassay. Hepatitis B surface antigen and antibodies to hepatitis B core were carried out using enzyme immunoassays. Liver enzymes (alanine aminotransferase, aspartate aminotransferase) and total bilirubin were measured using reagents on chemistry autoanalyzer (Hitachi 911). Intravenous drug users group (38) was aged 31±5.6 years, 33 males and 5 females. Prostitutes group (102) were aged 25.1±7 years. Blood donors group (2100) aged were 26.3±10.3 years, 1960 males and 140 females.

Results: The prevalence of hepatitis C virus antibodies was 60.5% among intravenous drug abusers, 1.96% among

the prostitutes group, and 0.95% among blood donors group. Whereas, the positivity of hepatitis B surface antigen was 5.3% among the intravenous drug abusers, 10.8% among the prostitutes group, and 3.8% among blood donors group. Biochemical parameter results were compared to the results of these parameters that were determined in a group of healthy members (blood donors) during our study.

Conclusions: The prevalence of hepatitis C virus antibodies among intravenous drug abusers is considered the highest number among high risk groups, however, it is comparable to that reported in other countries. The impact of hepatitis C among drug users is profound, amplifying the spread of hepatitis C virus infection and sustaining it in the general population. The prevalence of anti-hepatitis C virus among the prostitutes group was a little higher than that determined among the general population. The transmission of hepatitis C virus via a sexual route is still common and important. The control of the sexual behavior may have a role in minimizing the spread of this pathogen among the general population.

Keywords: Prevalence, hepatitis C virus, hepatitis B surface antigen, intravenous drug abusers, prostitutes.

Saudi Med J 2002; Vol. 23 (4): 393-395

The risk of hepatitis C virus (HCV) infection is greater than 90% in intravenous drug abusers as

evidenced by their high prevalence (48%-90%) of hepatitis C virus antibodies (anti-HCV).¹⁻⁵ Studies

From the Clinical Laboratory Department, Al-Assad University Hospital, Damascus, Syria.

Received 28th April 2001. Accepted for publication in final form 7th October 2001.

Address correspondence and reprint request to: Dr. Basem M. Othman, PO Box 511, Al-Tal, Damascus, Syria. Tel. +963 (11) 8820668/2131619. Fax. +963 (11) 6119809.

showed that 75% of intravenous drug abusers with acute non-A, non-B (NANB) hepatitis have anti-HCV.⁶ With the dramatic reduction in the frequency of transfusion-associated hepatitis that occurred during the late 1980s and early 1990, the number of reported cases of hepatitis C related to transfusion has fallen steadily; however, as the frequency of hepatitis C cases associated with other modes of hepatitis C transmission, especially intravenous drug use, has continued to increase, the overall frequency of hepatitis C among reported cases of acute hepatitis has remained relatively stable.⁷ Therefore, the impact of hepatitis C among drug users is profound, amplifying the spread of HCV infection and sustaining it in the general population.

Whether HCV is transmitted efficiently via sexual contact remains controversial. Some studies showed that among patients presenting with acute hepatitis C, approximately 10% have no other identifiable risk factor except for sexual contact with a person at risk of HCV infection.⁸ Studies of other populations, those with high intensity sexual exposure, contacts of HCV-infected persons, have highlighted the importance of sexual transmission of hepatitis C virus infection.

Methods. The prevalence of anti-HCV in a population of 38 Syrian intravenous drug abusers, 102 Syrian prostitutes, and 2100 blood donors was studied. For each member, information on demographic data, past medical history (accidents, surgery operations, blood transfusion, past hepatitis) were collected. A 5ml blood sample was collected, following the centrifugation, sera taken were divided into 3 separate samples: for viral markers, biochemistry evaluation, and archive purposes. All collected sera were frozen at -20°C . Alanine

aminotransferase (ALT), aspartate aminotransferase (AST), and total bilirubin (TB) were measured using Boehringer Mannheim reagents (IFCC recommended) on Hitachi 911 chemistry analyzer. Hepatitis B surface antigen (HBsAg) and antibodies (IgM, IgG) to hepatitis B core (anti-HBc) were measured using enzyme linked immunosorbent assays (ELISA). Testing for anti-HCV was carried out using 3rd generation HCV enzyme linked immunosorbent assay (ELISA-3). Testing for anti-HCV was repeated using microparticle enzyme immuno assay (MEIA). All viral tests were carried out using commercial available assays (Abbott GmbH Diagnostika, Wiesbaden, Germany). All tests were carried out in the laboratory of Al-Assad University Hospital, Damascus, Syria.

Results. The intravenous drug abusers group ranged from 18-43 years, with a mean age of 31 ± 5.6 years, 33/38 were males and 5/38 were females. The prostitutes group ranged from 18-55 years, with a mean age of 25.1 ± 7 years. Blood donors group ranged from 18-66 years, with a mean age of 26.3 ± 10.3 years, 1960/2100 were males and 140/2100 were females. Twenty-three out of 38 intravenous drug abusers were positive for anti-HCV (60.5%). Whereas, only 2 out of 38 intravenous drug abusers were positive for HBsAg (5.3%), the positivity of anti-HBc was found in 11 out of 38 members (28.9%). Only one case tested positive for anti-HCV, HBsAg, and anti-HBc (2.6%). Means of biochemical parameters were higher than that determined in the standard group (blood donors), the levels of ALT enzyme were especially slightly higher than the normal range.

Conversely, 2 out of 102 prostitutes were positive for anti-HCV (1.96%). Whereas, 11 out of 102

Table 1 - Prevalence of viral markers among the study groups.

Study groups (N)	Anti-HCV N (%)	HBsAg N (%)	Anti-HBc N (%)	HBsAg & Anti-HBc N (%)	Anti-HCV & HBsAg N (%)
Intravenous drug abusers (38)	23 (60.5)	2 (5.3)	11 (28.9)	2 (5.3)	1 (2.6)
Prostitutes group (102)	2 (2)	11 (10.8)	8 (7.8)	8 (7.8)	0 (0)
Blood donors (2100)	20 (0.95)	80 (3.8)	70 (3.3)	70 (3.3)	0 (0)

N - number, HCV - hepatitis C virus, HBsAg - hepatitis B surface antigen, HBc - hepatitis B core

Table 2 - Results of biochemical parameters among the study groups. (Comparison with a blood donors group which represents general population).

Study groups	ALT (U/L) Mean \pm SD	AST (U/L) Mean \pm SD	Total Bilirubin (mg/dl) Mean \pm SD
Intravenous drug abusers	58.2 ± 56.7	34.6 ± 28.8	0.49 ± 0.28
Prostitutes group	19.8 ± 11	19.9 ± 7.9	0.44 ± 0.25
Blood donors	25.3 ± 14.3	33.8 ± 15.8	0.48 ± 0.23

ALT- alanine aminotransferase, AST - aspartate aminotransferase, SD - standard deviation

prostitutes were positive for HBsAg (10.8%), 8 out of 102 prostitutes were positive for anti-HBc (7.8%). None of the members were positive for both anti-HCV and HBsAg. Means of biochemical parameters results of the prostitutes group were normal as compared to the normal ranges of these parameter which were determined in a blood donors group during our study.

The results of the blood donors group showed that the positivity of anti-HCV was 0.95% (20/2100), the positivity of HBsAg was 3.8% (80/2100), and the positivity of anti-HBc was 3.3% (70/2100). None of the members was positive for both anti-HCV and HBsAg. Means of biochemical parameters in this group were calculated and considered as the normal ranges of these parameters.

The prevalence of the studied viral markers can be seen in **Table 1**, and the results of the biochemical parameters could be seen in **Table 2**.

Discussion. The prevalence rate of anti-HCV among intravenous drug abusers in our study (60.5%) is considered one of the highest prevalences of the virus among high risk groups. The prevalence of anti-HCV among this group is comparable to that reported in other countries of the world.⁹⁻¹¹ The results of our study showed a high prevalence of anti-HBc (28.9%), in the presence of high prevalence of anti-HCV and the absence of high prevalence of HBsAg (5.3%). The impact of hepatitis C among drug users is profound, amplifying the spread of HCV infection and sustaining it in the general population.

Conversely, the prevalence of anti-HCV among the prostitution group in our study (1.96%) is considered one of the lowest prevalences of HCV antibodies among high risk groups. This prevalence is lower than that reported by other studies in the world, which showed a different anti-HCV positivity among prostitute groups between 4.4%-9.5%.¹²⁻¹⁵ This result is expected, as Syrian prostitutes have a lower number of sexual contact per month (120-150) in comparison to some studies,¹² which showed that this number may reach up to 870 sexual contact per month. In addition, other studies showed that this prevalence is related to the number of sexual partners, so the higher prevalence could be seen among the prostitutes who have a higher number of sexual partners.¹⁵ However, the prevalence of anti-HCV among the prostitution group is clearly higher than that determined among the blood donors group, a result which highlights the importance of this route in the transmission of HCV.

The prevalence of HBsAg among the prostitutes group in our study (10.8%) is significantly higher than the prevalence of anti-HCV among this group. This result confirms the fact that the transmission of HCV is less important via sexual contact than the

transmission of hepatitis B virus. The transmission of HCV via the sexual route is still common and important. The control of the sexual behavior may have an important role in minimizing the spread of HCV among the general population.

Acknowledgments. We are grateful to Abbott Diagnostics, North Middle East, Cairo, for funding the study. We would also like to thank the staff working in the laboratory of Al-Assad University Hospital for providing their fruitful technical assistance. In general thanks to all colleagues who helped in one way or another.

References

1. Estaban JI, Esteban R, Viladomiu L, Lopez-Talavera JC, Gonzalez A, Hernandez JM et al. Hepatitis C virus antibodies among risk groups in Spain. *Lancet* 1989; 2: 294-296.
2. Roggendorf M, Deinhardt F, Rasshofer R, Eberle J, Hopf U, Moller B et al. Antibodies to hepatitis C virus. *Lancet* 1989; 2: 323-324.
3. Crofts W, Hopper JL, Bowden DS, Breschkin AM, Milner R, Locarnini SA. Hepatitis C virus infection among a cohort of Victorian injecting drug users. *Med J Aust* 1993; 159: 237-241.
4. Van den Hoek JAR, Van Haarstrecht HJA, Goudsmit J, de Wolf F, Coutinho RA. Prevalence, incidence, and risk factors of hepatitis C virus infection among drug users in Amsterdam. *J Infect Dis* 1990; 162: 823-826.
5. Verbaan H, Andersson K, Eriksson S. Intravenous drug abuse-the major route of hepatitis C virus transmission among alcohol-dependent individuals. *Scand J Gastroenterol* 1993; 28: 714-718.
6. Bortolotti F, Tagger A, Cadrobbi P, Crivellaro C, Pregliasco F, Ribero ML et al. Antibody to hepatitis C virus in community-acquired acute non-A, non-B hepatitis. *J Hepatol* 1991; 12: 176-180.
7. Alter MJ, Hadler SC, Judson FN, Mares A, Alexander WJ, Hu PY et al. Risk factors for acute non-A, non-B hepatitis in the United States and association with hepatitis C virus infection. *JAMA* 1990; 264: 2231-2235.
8. Alter MJ, Coleman PJ, Alexander J, Kramer E, Miller JK, Mandel E et al. Importance of heterosexual activity in the transmission of hepatitis B and non-A, non-B hepatitis. *JAMA* 1989; 262: 1201-1205.
9. Stark K, Schreier E, Muller R, Wirth D, Driesel G, Bienzle U. Prevalence and determinants of anti-HCV seropositivity and of HCV genotype among intravenous drug users in Berlin. *Scand J Infect Dis* 1995; 27: 331-337.
10. Tennant F, Moll D. Seroprevalence of hepatitis A, B, C, and D markers and liver function abnormalities in intravenous heroin addicts. *J Addict Dis* 1995; 14: 35-49.
11. Smyth R, Keenan E, Dorman A, Oconnor J. Hepatitis C infection among injecting drug users attending the National Drug Treatment Center. *Ir J Med Sci* 1995; 164: 267-268.
12. Papaevangelou G, Roumeliotou A, Kotsianopoulou M, et al. Sexual transmission of HCV. In: Zuckerman AJ, editors. *Viral Hepatitis and Liver Disease*, New York (NY): Alan R. Liss; 1991. p. 420-421.
13. Nakashima K, Kashiwagi S, Hayashi J, Noguchi A, Hirata M, Kajiyama W et al. Sexual transmission of hepatitis C virus among female prostitutes and patients with sexually transmitted disease in Fukuoka, Kyushu, Japan. *Am J Epidemiol* 1992; 136: 1132-1137.
14. Lissen E, Alter HJ, Abad MA, Torres Y, Perez-Romero M, Leal M et al. Hepatitis C virus infection among sexually promiscuous groups and the heterosexual partners of hepatitis C virus infected index cases. *Eur J Clin Microbiol Infect Dis* 1993; 12: 827-831.
15. Zhang GQ, Chen SD, Lian JH. Seroepidemiological study of HBV and HCV infection in sexually promiscuous groups. *Chung Hua Liu Hsing Ping Hsueh Tsa Chih* 1995; 16: 213-216.