

## BRIEF COMMUNICATION

### PREVALENCE OF HEPATITIS C ANTIBODIES AMONG HEALTH CARE WORKERS AT HIGH RISK FOR BLOOD EXPOSURE

R.M.B. MARTINS(1), V.C. ALMEIDA(1), B.O.M. VANDERBORGH(2), J.B.A. BRITO(1), D.D.P. CARDOSO(1),  
M.S. PEREIRA(3) & C.F.T. YOSHIDA(4)

---

**KEYWORDS:** Hepatitis C virus; Occupational risk; Health care workers.

---

Hepatitis C virus (HCV), which was first cloned by CHOO et al.<sup>3</sup>, is considered to be the major agent of post-transfusion and sporadic non-A, non-B hepatitis. HCV infection results in high chronic carrier rates leading to chronic liver disease, cirrhosis and hepatocellular carcinoma<sup>5</sup>. Health care workers are known to be at increased risk for occupational transmission of blood-borne viruses, such as HCV<sup>4,6,9,15</sup>. In particular, transmission through needlestick accident has been confirmed by HCV genotyping or molecular evolutionary analysis<sup>12,16</sup>. However, few studies have been conducted among health care workers in Brazil. In order to evaluate the risk for occupational exposure, we studied the prevalence of antibodies against HCV (anti-HCV) among medical personnel at high risk working at the University Hospital of the Federal University of Goiás in Goiânia, Central Brazil.

A total of 150 health care workers were evaluated in this study, including 10 physicians, 90 nurses, 21 laboratory technicians, and 20 ancillary staff. They were working in the following hospital units: emergency medicine, blood bank, intensive care medicine, and dialysis center. Nine oral surgeons from the Faculty of Dentistry were also evaluated. All subjects were interviewed for possible risk factors including a history of needlestick acci-

dents or other percutaneous exposure to blood, type of work and number of years of employment, blood transfusions, intravenous drug use, tattooing, contacts with persons having hepatitis, number of sexual partners, and history of sexually transmitted diseases. Sera were obtained from all participants and stored at -20°C until testing for anti-HCV.

A third generation enzyme-linked immunosorbent assay (ELISA) was used to detect anti-HCV antibodies using a mixture of core, NS3, NS4, and NS5 antigens (HBK 425-Hemobio, HCV ELISA, Embrabio). Positive samples were retested for confirmation of results with a line immunoassay (LIA) using immunodominant epitopes of core, E2/NS1, NS3, NS4, and NS5 antigens (Inno-LIA HCV Ab III, Innogenetics).

Of the 150 health care workers, 4 (2.6%) were found to be anti-HCV-positive in the screening test (ELISA), and 3 were subsequently confirmed positive with the Inno-LIA HCV Ab III assay, resulting in an anti-HCV prevalence of 2.0%. These results record well with prevalence rates found in Central Brazilian blood donors (2.2 by ELISA and 1.4% by LIA)<sup>11</sup>. Investigations among health care workers in Japan<sup>7</sup>, Taiwan<sup>10</sup>, France<sup>5</sup>, the United Kingdom<sup>17</sup>, Spain<sup>13</sup>, and Italy<sup>14</sup> also indicate

---

(1) Lab. de Virologia, IPTESP, Universidade Federal de Goiás, Goiânia, Goiás, Brasil.

(2) Innogenetics N.V., Ghent, Belgium.

(3) Dep. de Enfermagem, FEN, Universidade Federal de Goiás, Goiânia, Goiás, Brasil.

(4) Dep. de Virologia, Instituto Oswaldo Cruz, Rio de Janeiro, RJ, Brasil.

**Correspondence to:** Regina Maria Bringel Martins, Departamento de Microbiologia, IPTESP, Universidade Federal de Goiás, C.P. 131, 74605-050 Goiânia, GO, Brasil.

low prevalence rates. These data therefore suggest that there has only been limited occupational transmission of HCV to health care workers.

Although almost 80% of the health care employees interviewed in our study reported a history of needlestick accidents or other percutaneous exposure to blood of patients, the low anti-HCV prevalence found may be due to the low viremia levels of HCV, and the small amount of inoculum in reported accidents. The anti-HCV-positive employees had worked for more than 10 years in the blood bank (1/21), intensive-care medicine (1/46), and emergency medicine (1/59). All three had a history of occupational exposure to blood, and 2 had previously received blood transfusions.

Nevertheless, other studies have shown higher anti-HCV prevalence among health-care workers<sup>4,6,9</sup>. This differs from our observations and may be due to risk factors such as the type of needle, amount of blood in the device, and the HCV-RNA status of the infected patient.

Some reports have also indicated that the risk of occupational infection with HCV is much lower than that found for the hepatitis B virus (HBV)<sup>1,5,13</sup>. Previously, we found a prevalence rate of 23.4% for HBV in hospital employees in Central Brazil, with the highest risk occurring at the hemodialysis center, followed by the blood bank, emergency medicine, and intensive care medicine units<sup>2</sup>.

In conclusion, despite the frequent exposure to blood from patients, the prevalence of HCV infection among health-care personnel is low. However, infection remains a threat as no effective treatment or preventive vaccine is available. Efforts to avoid exposure to body fluids are therefore the best way to protect health-care workers against HCV, HBV, and other infectious agents.

#### ACKNOWLEDGEMENTS

The authors are grateful to F. Shapiro for reviewing the manuscript, to D.M.F. Gomes and R.C.O. Oliveira for technical assistance.

#### REFERENCES

1. AMARAPURKAR, D.N. – Prevalence of hepatitis C antibodies in health care workers. *Lancet*, 344:339, 1994.
2. AZEVEDO, M.S.P.; CARDOSO, D.D.P.; MARTINS, R.M.B. et al. – Rastreamento sorológico para hepatite B em profissionais de saúde na cidade de Goiânia – Goiás. *Rev. Soc. bras. Med. trop.*, 27:157-162, 1994.

3. CHOO, Q.L.; KUO, G.; WINER, A.J. et al. – Isolation of a cDNA clone derived from a blood-borne non-A, non-B viral hepatitis genome. *Science*, 244:359-361, 1989.
4. CUMMINS, A.J. & TEDDER, R.S. – Inadequate information on needlestick accidents. *Lancet*, 339:1178-1179, 1992.
5. GERMANAUD, J.; BARTHEZ, J.P. & CAUSSE, X. – The occupational risk of hepatitis C infection among hospital employees. *Amer. J. publ. Hlth.*, 84:122, 1994.
6. JADOUL, M.; EL AKROUT, M.; CORNU, C. et al. – Prevalence of hepatitis C antibodies in health care workers. *Lancet*, 344:339, 1994.
7. KIYOSAWA, K.; SODEYAMA, T.; TANAKA, E. et al. – Hepatitis C in hospital employees with needlestick injuries. *Ann. intern. Med.*, 115:367-369, 1991.
8. KIYOSAWA, K.; TANAKA, E.; SODEYAMA, T. et al. – Natural history of hepatitis C. *Intervirology*, 37:101-107, 1994.
9. KLEIN, R.S.; FREEMAN, K.; TAYLOR, P.E. et al. – Occupational risk for hepatitis C virus infection among New York City dentists. *Lancet*, 338:1539-1542, 1991.
10. KUO, M.Y.P.; HAHN, L.J.; HONG, C.Y. et al. – Low prevalence of hepatitis C virus infection among dentists in Taiwan. *J. med. Virol.*, 40:10-13, 1993.
11. MARTINS, R.M.B.; VANDERBORGHT, B.O.M.; ROUZERE, C.D. et al. – Anti-HCV related to HCV PCR and risk factors analysis in a blood donor population of Central Brazil. *Rev. Inst. Med. trop. S. Paulo*, 36:501-506, 1994.
12. OKAMOTO, H.; SUGIYAMA, Y.; OKADA, S. et al. – Typing hepatitis C virus by polymerase chain reaction with type-specific primers: application to clinical surveys and tracing infectious sources. *J. gen. Virol.*, 73:673-679, 1992.
13. PEREZ-TRALLERO, E.; CILLA, G. & SAENZ, J.R. – Occupational transmission of HCV. *Lancet*, 344:548, 1994.
14. PURO, V.; PETROSILLO, N.; IPPOLITO, G. et al. – Occupational hepatitis C virus infection in Italian health care workers. *Amer. J. publ. Hlth.*, 85:1272-1275, 1995.
15. SCHLIPKÖTER, U.; ROGGENDORF, M.; CHOLMAKOW, K. et al. – Transmission of hepatitis C virus (HCV) from a haemodialysis patient to a medical staff member. *Scand. J. infect. Dis.*, 22:757-758, 1990.
16. SUZUKI, K.; MIZOKAMI, M.; MIZOUGUCHI, N. et al. – Confirmation of hepatitis C virus transmission through needlestick accidents by molecular evolutionary analysis. *J. infect. Dis.*, 170:1575-1578, 1994.
17. ZUCKERMAN, J.; CLEWLEY, G.; GRIFFITNS, P. et al. – Prevalence of hepatitis C antibodies in clinical health care workers. *Lancet*, 343:1618-1620, 1994.

Recebido para publicação em 05/07/1996  
Aceito para publicação em 05/09/1996