Evidence of Hepatitis C Virus Infection in Peritoneal Fluid but Not in Dialysate and Ultrafiltrate or Hemofiltrate

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Dear Sir,

With great interest we read the short communication by Caramelo et al. [1], who found hepatitis C virus (HCV) antibodies in 12 hemodialysis and 5 continuous ambulatory peritoneal dialysis patients. All sera of the studied patients were positive for HCV RNA, whereas polymerase chain reaction (PCR) performed on samples of hemodialysis ultrafiltrate or peritoneal effluent were always negative for HCV RNA.

We would like to draw your attention to a multicenter clinical study where we investigated the prevalence of anti-HCV in patients on peritoneal dialysis [2]. The reactive sera were confirmed by RIBA, and viremia was determined by PCR.

The total prevalence of anti-HCV among the patients studied was 18 out of 333 (5.4%). The prevalence of anti-HCV among the centers ranged from 0 to 30%. Fifteen out of 18 sera reactive by ELISA were positive when tested by RIBA resulting in a prevalence of 4.5%. These sera were considered as truly positive and tested by PCR for viremia. Eleven of the 15 seropositive patients showed HCV RNA in serum when tested by nested PCR, indicating viremia in most of the antibody-positive patients. From the 11 patients whose sera were positive for HCV RNA, 9 dialysates were tested. Seven of 4 showed antibodies by ELISA or HCV RNA, respectively, also in the peritoneal dialysate. There is no doubt that blood transfusion is a source of HCV infection. However, in our study the total duration of dialysis (peritoneal and hemodialysis duration) was found to be a significant risk factor. This correlation implies nosocomial modes of HCV infection. Caramelo et al. [1] could show that a significant group of patients remained HCV

antibody negative, although they shared the same dialysis machine with positive patients. However, whether the sharing of hemodialysis machines contributes to HCV transmission remains moreover to be elucidated.

For the first time, we detected the presence of antibodies against various structural and nonstructural antigens (C22, C33c, C100) and HCV RNA in the peritoneal dialysate of seropositive peritoneal dialysis patients. Krautzig et al. [3] found in 4 of 5 HCV-RNA-positive patients the peritoneal dialysate also positive, at least on 1 of 3 occasions. The HCV RNA was only in 1 case 3 times positive. It is interesting that HCV RNA was detected in serum and dialysate of our studied patients in 73.3 and 44.4%, respectively. This observation

may be related to a lack of sensitivity of the PCR assay to detect HCV RNA or possible intermittent viremia [4].

The presence of HCV RNA in peritoneal dialysates underlines the potential risk of HCV transmission by peritoneal fluid. This is similar to the HBsAg positivity of peritoneal dialysate from patients who are chronic carriers of HBV. The spread of HBV infection through spilled peritoneal dialysate from peritoneal dialysis patients seropositive for HBV has been reported [5].

From patients positive for HBsAg and HBV DNA, neither HBsAg nor HBV DNA was found in the dialysate or ultrafiltrate [6]. Similarly, in a pilot study we could not find HCV RNA in the dialysate and ultrafiltrate or hemofiltrate with cellulose or high-flux membranes either, from patients whose sera were positive for HCV RNA. The finding that PCR RNA is positive in peritoneal dial-

ysate but not in dialysate, ultrafiltrate or hemofiltrate suggests that the peritoneal membrane may be more permeable than hemodialysis and hemofiltration membranes.

Caution is warranted to prevent the risk of spreading HCV infection, even if Caramelo et al. [1] conclude that the dialysis ultrafiltrate or peritoneal fluid seems to be an improbable source of HCV transmission in the dialysis setting.

References

Caramelo C, Navas S, Alberola ML, Bermejillo T, Reyero A, Carreño V: Evidence against transmission of hepatitis C virus through hemodialysis ultrafiltrate and peritoneal fluid.

Nephron 1994;66:470-473.

Gladziwa U, Schlipkötter U, Lorbeer B, Cholmakow K, Roggendorf M, Sieberth HG: Prevalence of antibodies to hepatitis C virus in patients on peritoneal dialysis – A multicenter study. Clin Nephrol 1993;40:46-52.

Krautzig S, Tillmann H, Wrenger E, Manns M, Koch KM, Brunkhorst R: Hepatitis C virus (HCV) in peritoneal dialysis. Clin Nephrol 1994;41:120.

Farci P, London WT, Wong DC, Dawson GJ, Vallari DS, Engle R, Purcell RH: The natural history of infection with hepatitis C virus (HCV) in chimpanzees: Comparison of serologic responses measured with first- and second-generation assays and relationship to HCV viremia. J Infect Dis 1992;165:1006-1011.

Goodman W, Gallagher N, Sherrard DJ: Peritoneal dialysis fluid as a source of hepatitis antigen. Nephron 1981;29:107-109.

De Jong GMTh, de Bruin W, Verresen L, Mo-shage H, Desmyter J, Yap SH: High-flux membranes are not permeable to hepatitis B virus DNA. Nephron 1992;60:368.