

ease progression.

Hyperviscosity and hypercalcemia are the usual causes of encephalopathy in MM. Hyperammonaemic encephalopathy is usually described in serious liver dysfunction and is characterized by lethargy, confusion and asterixis, which can progress to coma and death.<sup>1</sup>

Mitchell *et al.*<sup>3</sup> identified this complication in eight of 460 patients who had leukemia or had had a bone marrow transplantation. A few cases have also been reported in MM.<sup>4-10</sup> The etiology of this syndrome has yet to be determined. Matsuzaki *et al.*<sup>6</sup> found that the myeloma cells from a patient with hyperammonaemic encephalopathy secreted ammonia at a high level into the culture medium.

Different treatments (protein restriction, lactulose, neomycin, plasmapheresis, hemodialysis...) have been tried in this syndrome,<sup>4-10</sup> but only chemotherapy has been successful. Nevertheless this complication is associated with disease progression and so with a very bad prognosis. We suggest that hyperammonaemic encephalopathy should be included in the differential diagnosis of disturbances of consciousness in MM.

#### Keywords

*Multiple myeloma, encephalopathy, hyperammonemia*

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#### High prevalence of anti-HGV/E2 antibodies in HCV-positive patients with non Hodgkin's lymphoma

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**We evaluated in a series of 33 HCV positive (both RT-PCR and HCV RIBA 2 assays) B cell non-Hodgkin's lymphomas (NHL) patients the prevalence of active and inactive HGV infection by HGV RNA assays (RT-PCR) and anti HGV antibodies directed against E2 structural protein (immunoenzimatic method), a reliable serologic marker of past HGV infection followed by viral clearance. We found only one patient with HGV positivity at RT-PCR (3%). Twenty-six of 33 patients were positive for anti HGV/E2 antibodies (78.8%) suggesting past infection. If confirmed, our preliminary data seem to suggest a higher incidence of HGV past infection in our group of HCV positive patients with B cell NHL.**

A possible etiologic correlation between hepatitis C virus (HCV) and B cell NHL was recently suggested by some authors.<sup>1-5</sup> and the ability of HCV to infect lymphocytes and to determine clonal expansion of such cells has been clearly documented. Another flaviviridae agent, GBV-C/HGV, was recently isolated and described as a possible etiologic agent of non A-E hepatitis. There is a close molecular correlation between HCV and HGV and co-infection with HGV is frequent in HCV positive patients.

The prevalence of HGV infection in B cell lymphomas is not known, although if there are some preliminary data from Italy<sup>6</sup> and Japan.<sup>7</sup> Zignego *et al.*<sup>6</sup> reported a 6% of prevalence of HGV RNA in a series of 150 B cell NHLs: no significant differences in HGV prevalence was found between HCV positive (n = 37) and negative (n = 113) cases. The HGV prevalence in Italian NHL patients was similar to that observed in non A-E hepatitis patients but significantly higher than that in healthy subjects. On the other hand, Nakamura *et al.*<sup>7</sup> found 4 HCV RNA positive cases and one HGV RNA/HCV RNA positive case in a series of 51 B cell NHL patients (2% of prevalence for HGV RNA).

We, therefore, evaluated, in a series of 33 HCV positive (both RT-PCR and HCV RIBA 2 assays) B cell NHL patients, the prevalence of active and inactive

Table 1.

Subjects	HGV RNA*	Anti HGV/E2*
Controls	7/249 (2.8%)	177/506 (35%)
HCV+ B-NHL (n=33)	1/33 (3%)	26/33 (78.8%)

HGV infection by HGV RNA assays (RT-PCR) and anti-HGV antibodies directed against the E2 structural protein (immunoenzymatic method), a reliable serologic marker of past HGV infection followed by viral clearance.<sup>8</sup> Serum specimens were taken at the onset of the disease and stored at  $-20^{\circ}\text{C}$ ; we found only one patient with HGV positivity by RT-PCR (3%). Twenty-six of 33 patients were positive for anti HGV/E2 antibodies (78.8%) suggesting past infection.

This prevalence of HGV RNA was similar to that found in a population of healthy subjects matched for age and sex, tested as controls (Chi-square test: NS). In contrast, the prevalence of HGV antibodies was significantly higher in the NHL population than in the controls (Chi square test:  $p < 0.0001$ : see Table 1).

Even if we compare our findings with the prevalence of anti HGV/E2 reported in healthy subjects, drug abusers and blood donors by Tacke *et al.*,<sup>9</sup> the detection of antibodies against HGV/E2 protein is much higher in our HCV positive NHL patients. It must be stressed that the immunoenzymatic method we used for anti HGV/E2 antibodies was tested as highly specific: therefore, cross reaction with anti-HCV-E2 antibodies is unlikely.

If confirmed, our preliminary data seem to suggest a higher incidence of past HGV infection in our group of HCV positive patients with B cell NHL. Whether or not this has any role (together with HCV) in the etiology or evolution of the neoplastic disease needs to be elucidated.

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### Serum transferrin receptor in polycythemia

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**We measured serum transferrin receptor (sTfR) levels in 22 patients with polycythemia vera and in 26 cases of secondary polycythemia. In our study, raised sTfR levels in both polycythemia groups were related to iron deficiency.**

In normal adults a strong correlation has been shown to exist between serum transferrin receptor (sTfR) and standard ferrokinetic measurements of erythropoiesis<sup>1</sup> with the result that the level of erythropoietic activity is the most important determinant of sTfR. Increased expression of transferrin receptor (TfR) has also been documented on the surface of malignant tumor cells such as erythroleukemic cells.<sup>2</sup> Whether the shedding of these receptors can contribute to sTfR levels is still unclear. We measured sTfR in polycythemia patients to investigate its potential clinical usefulness. The sTfR was measured using a commercial immunoassay (ELISA) (Quantikine™, transferrin receptor EIA kit, R&D Systems, Minneapolis, USA) in 26 patients with secondary polycythemia (SP), 22 patients with polycythemia vera (PV) and 63 normal controls (REF group).

The sTfR levels (mean±SD) were  $2.6 \pm 0.5$  mg/L in the REF group,  $5.9 \pm 3.9$  mg/L in PV group and  $4.7 \pm 2.9$  mg/L in the SP group; sTfR was higher in both polycythemia groups than in the REF group (ANOVA,  $p < 0.0001$ ). After excluding patients with iron deficiency, however, the sTfR levels in both polycythemia groups were  $2.8 \pm 0.9$  mg/L in the SP group (n=15), and  $2.9 \pm 0.8$  mg/L in the PV group (n=8). Moreover, there was no difference with respect to