TBE NEWS

IS THERE A CORRELATION BETWEEN THE LEVEL OF TBE VIREMIA AND THE SEVERITY OF THE DISEASE?

Background

After a tick bite, TBE virus replication starts locally in dendritic skin cells. From there, the virus migrates to other organs, e.g. the spleen, liver and bone marrow. It is generally assumed that a high-level production of the TBE virus in these organs is the prerequisite for the virus to cross the blood-brain barrier where it induces neurological symptoms. What is yet not known is the level of TBE virus RNA in patients and if the RNA concentration correlates with clinical parameters including severity of the disease.

Results

The authors analyzed clinical characteristics and laboratory findings of 80 Slovenian patients. TBE virus RNA could be detected in all patients with febrile illness, in whom neurologic involvement later developed, and who fulfilled criteria for TBE. However, in only 48 of these patients TBE virus RNA could be detected in CSF samples at the meningoencephalitis phase. The mean (SD) of the logarithmic transformation of TBE virus RNA levels in serum was 4.65 log10 copies RNA/ml, mostly in a range of 3-6 log10 copies RNA/ml. RNA could be detected as early as the first day and as late as the tenth day of the initial phase of TBE. In females, the TBE virus RNA level was higher (SD: 4.86) than in male patients (SD: 4.4 log10 copies RNA/ml). The RNA level did not correlate with ages of patients, leukocyte and platelet counts during the initial phase, the interval phase and the second phase of TBE; neither was there a correlation to clinical symptoms of the disease (mild, moderate or severe). The authors observed no differences in distribution of RNA levels in the initial phase when compared with TBE IgG levels in follow-up samples in the second phase of disease. Furthermore, the authors partially sequenced the glycoprotein E gene of the virus obtained from serum samples. Analyses showed that the sequences could be grouped to six virus clades circulating in Slovenia. There was a high regional clustering, but there was no significant association of clades with severity of disease.

Discussion

The authors confirmed that examination of TBE virus RNA in serum during the first phase is a valuable approach for diagnosis of TBE virus infection, whereas virus RNA examination of CSF obtained in the second phase of disease is not a valuable approach. The authors could not find any correlation between TBE virus load in the initial phase of infection and several clinical parameters, including IgG concentration determined at the beginning of the second phase of disease and severity of disease. However, an association was found between disease severity and IgG levels (measured with Enzygnost anti-TBE/FSME Virus test, Siemens AG): the highest concentrations of antibodies were detected in patients with mild disease and the lowest concentration in patients with severe disease. A limited or delayed humoral response may result in a more severe form of illness by the failure to efficiently clear the virus. Thus, a prolonged viremia could result in a more pronounced infection of neural cells and subsequently in a more severe disease.

Literature

Saksida et al.

Virus RNA load in patients with tick-borne encephalitis, Slovenia.

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