01506
Pitfalls of serologic diagnostics: tick-borne encephalitis and neuroborreliosis co-infection

01. Viral infection & disease (non COVID-19)

1e. Emerging/re-emerging, vector-borne and zoonotic viral diseases (all aspects)
Likely attendance
Onsite

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Background

Tick-borne encephalitis (TBE) and neuroborreliosis (NB) are tick-borne infections endemic to central Europe. Therefore, there is a possibility of coinfection in humans (1). In the literature, TBE and NB coinfections are rarely mentioned, with only two reports (2,3) describing larger groups of patients. Since 2018, following the introduction of tests to detect intrathecal Borrelia antibody synthesis in cerebrospinal fluid (CSF), we have noted a number of patients coinfected with TBE and NB.

Methods

A single-centre retrospective observational study included patients hospitalised with confirmed TBE between Oct. 1, 2018, and Nov. 1, 2022. The prevalence of NB coinfection was reviewed in this cohort. The diagnosis of TBE was based on the ECDC case definition. In these patients, the diagnosis NB was defined as probable (evidence of intrathecal Borrelia antibody synthesis) and possible (evidence of Borrelia antibody in CSF without intrathecal synthesis) (4).

Results

Of the 296 confirmed TBE cases, 67 cases (22.6%) were considered NB because they had positive Borrelia antibodies in the CSF, but of these, only 28 cases (13.2%) had confirmed intrathecal synthesis of Borrelia antibodies. Clinical forms included: meningitis (n=119, 40.2%), encephalitis (n=150, 50.7%), and encephalomyelitis (n=23, 7.8%). Patients with TBE and NB coinfection were older than patients with TBE alone 56 years (IQR, 44-68) vs. 53 years (IQR, 41-66), p=0.3082, and hospitalization lasted longer 9 days (IQR, 7-13) vs. 8 days (IQR, 7-10), p=0.0537. Patients with TBE/NB coinfection compared to TBE monoinfection had more severe CNS inflammation [CSF protein 0.82 g/l (IQR, 0.60-1.00) vs. 0.69 g/l, (IQR, 0.53-0.83) p=0.0052; CSF leukocytes 88/µL (IQR, 40-158) vs. 53/µL (IQR, 23-92), p=0.0024] and more often developed encephalitic rather than meningitic form (48/66 TBE/NB cases, 72.7% vs. 123/222 TBE monoinfection cases, 55.4%, p=0.0149). None of the coinfection cases had symptoms typically associated with NB (facial nerve paresis, Banwarth syndrome).

Conclusions

In patients with symptoms of meningitis or encephalitis in endemic areas, coinfection with NB and TBE should be considered to allow administration of appropriate antibiotics. Diagnosis is difficult because of overlapping clinical presentation and proteino-cytologic association in both infections, which complicates interpretation of serologic findings.

Keyword 1
Zoonoses, vector-borne and One Health
Keyword 2
Viruses and clinical virology
Keyword 3
Tick-borne encephalitis
References, word count: 30 words
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Conflicts of interest

Do you have any conflicts of interest to declare?
No