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Infection with *Anaplasma phagocytophilum* in humans from north-eastern Poland

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Objectives

Anaplasmosis is an infectious disease caused by bacteria *Anaplasma phagocytophilum*, which are transmitted to humans through tick bite. Symptoms of the disease are similar to tick-borne encephalitis, but treatment is different. The aim of the study was to analyze clinical picture of patients after tick bite, in whom DNA of *Anaplasma phagocytophilum* was detected.

Methods

Sixty three patients (25 women, 38 men; mean age: 43±16 years old) were included to the study. They were hospitalized between 2009-2013 because of various symptoms after tick bite. All patients had routine laboratory tests performed. In cases of suspected meningitis lumbar puncture was performed. All patients had PCR for *Anaplasma phagocytophilum* (Anaplasma BLIRT-DNA, Poland), *Borrelia* spp. (Gene Proof, Czech Republic) and *Babesia* spp., serology for *Babesia* spp. (Focus Diagnostics, Cypress, California, USA), *Borrelia* spp. (Biomedica, Germany) and TBEV infection (*SERION ELISA classic TBE Virus IgG/IgM* (Institut Virion/Serion GmbH, Germany) and blood smears (May-Grunwald and Giemsa) to search for *Babesia* spp. and *A. phagocytophilum* circulating stages performed at moment of admission.

Results

Twenty nine (46%) of analyzed patients were inhabitants of rural areas. In three (4.5%) cases infection was work related. Forty eight (76%) patients remembered tick bite, 13 (20%) reported erythema migrans. The mean diameter of EM was 7 ±11.8 cm. In 10 (15%) patients *Borrelia* spp DNA was found in serum, and in 7 (11%) from skin sample. One (1.5%) patient was co-infected with *Babesia microti*. Seventeen (27%) patients were infected with TBEV, what was confirmed by clinical presentation (meningitis/encephalitis), serological and routine laboratory tests. Forty four (69%) patients suffered from fever, 20 (29%) from muscle pain, 14 (20%) from joint pain, 34 (49%) from headache, 12 (17%) from vertigo, 15 (21%) from nausea, 10 (14.5%) vomited. In physical examination 22 (31%) patients had meningeal signs. In laboratory tests increase in CRP concentration (21±37mg/dl) and SD (25±15mm/h) was observed. In 17 (26%) patients thrombocytopenia (the lowest - 56 tys/μl), in 11 (17%) patients leukopenia (the lowest 1.5 tys/μl) and in 5 (8%) anemia were observed. Elevated activity of aminotransferases was seen in 17 (26%) patients (the highest 207 IU/ml). In blood smear we observed no morulae in neutrophils for *A. phagocytophilum* infection. All patients reacted well for doxycycline.

Conclusions:

1. Infection with *A. phagocytophilum* in humans is more often than previously thought.
2. Anaplasmosis must be considered in differential diagnosis of patients after the tick bite, especially in patients with symptoms similar to TBE.
3. PCR seem to be more sensitive method than blood smear.