A systematic screening of undiagnosed neuroinfections for tick-borne encephalitis in the Upper Silesia region of Poland

Alicja Książek,[1] Brygida Adamek,[2] Anna Szczerba-Sachs,[1] Andrzej Wiczkowski,[2] Paweł Stefanoff[3]

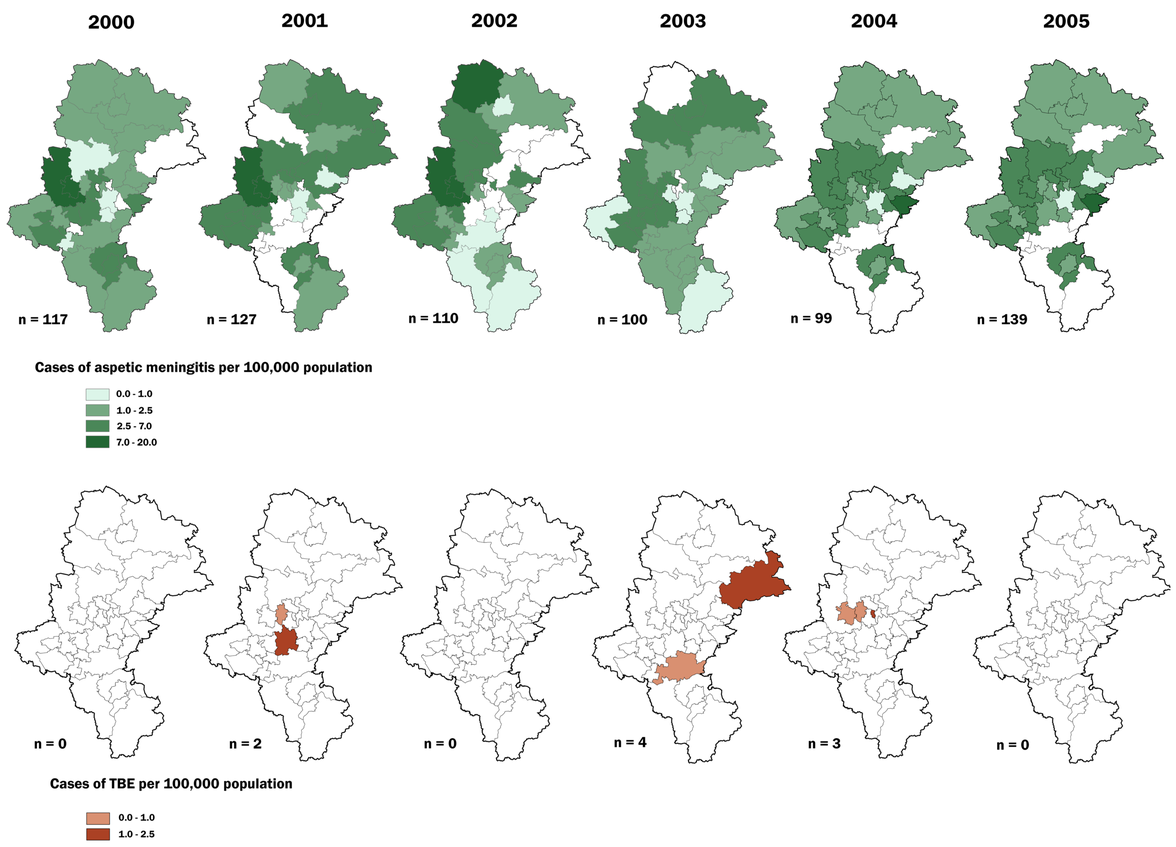
1) Voivodship Sanitary-Epidemiological Station in Katowice, Katowice, Poland.
2) Department of General Biology, Medical University of Silesia, Katowice, Poland.
3) Department of Epidemiology, National Institute of Hygiene, Warsaw, Poland

Background

- Upper Silesia is the most densely populated, highly industrialised province in Poland neighbouring to regions endemic for tick-borne encephalitis (TBE) in the Czech Republic.

- Compared to the relatively high and unevenly distributed incidence of aseptic neuroinfections of unknown origin, only sporadic cases of tick-borne encephalitis were registered in the region of Silesia during the previous years (Fig. 1). During 2000-2005, a median of 117 cases of undiagnosed aseptic meningitis and/or encephalitis and 2 cases of TBE were reported.

Figure 1. Geographic distribution of reported cases of aseptic meningitis and/or encephalitis, and tick-borne encephalitis, Upper Silesia region, 1999-2005.



- Considering the increasing incidence of Lyme borreliosis in the region and the existence of favourable conditions for ticks, TBE may be under diagnosed and under reported in Upper Silesia.
- The aim of the present study was to screen systematically all cases of aseptic meningitis or encephalitis diagnosed in Silesian hospitals for presence of anti-TBEV antibodies.

Material and Methods

- Serum and cerebrospinal fluid (CSF) samples were collected from residents of Upper Silesia province hospitalised with a suspicion of aseptic meningitis or encephalitis between 1st January and 30nd November 2006.
- Each specimen was tested for anti-TBE IgG antibodies in CSF, as well as IgM and IgG antibodies in serum using enzyme-linked immunosorbent assay (FSME ELISA IgG/IgM Testkit, Genzyme Virotech GmbH). Additionally, socio-economic, clinical and exposure data were collected for each subject.

Voivodship Sanitary-Epidemiological Station
ul. Raciborska 39,
40-957 Katowice
Poland

Contact with author:
ep-sekr@wsse.katowice.pl

Results

- During the present study 122 suspected cases were investigated, of which 120 have been tested for TBE (Table 1).
- Among the suspected cases investigated, only 83 had final diagnosis compatible with aseptic meningitis and/or encephalitis (Table 2).

Table 1. Demographic characteristics of the studied group, Upper Silesia, 2006

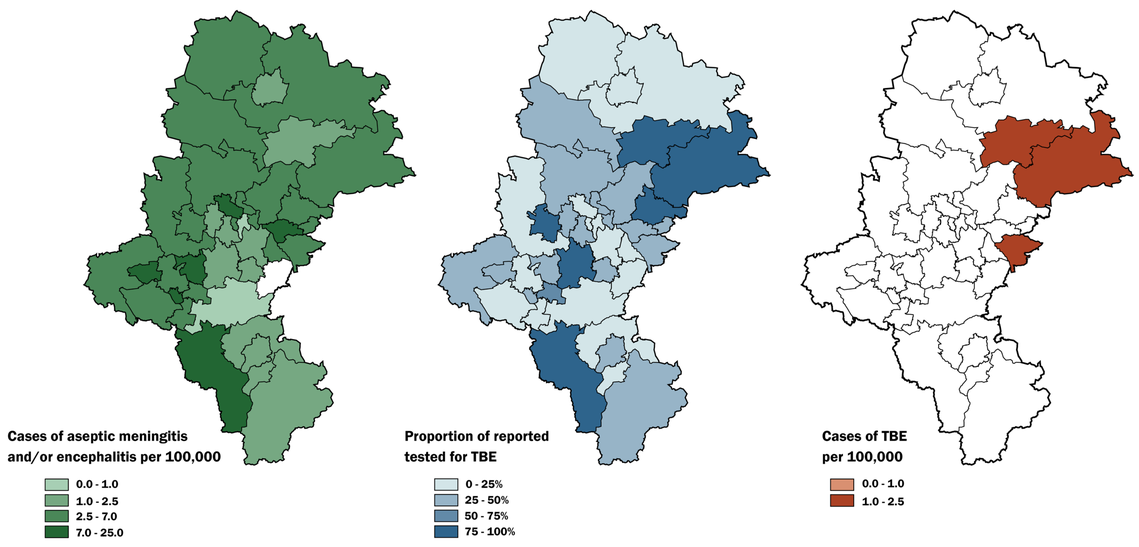
Group characteristic	*Number of cases*	*Percent of total*
Age group		
<10	6	4,9%
10-19	33	27,0%
20-29	29	23,8%
30-39	20	16,4%
40-49	9	7,4%
50-59	14	11,5%
60+	11	9,0%
Gender		
Females	48	39,3%
Males	74	60,7%
Residence type		
Urban	99	81,1%
Rural	23	18,9%
Occupation		
Student	93	76,2%
Office work	12	9,8%
Physical work	4	3,3%
Retired	8	6,6%
Unemployed	3	2,5%
Not relevant	2	1,6%

Table 2. Clinical syndromes diagnosed in the studied group, Upper Silesia, 2006

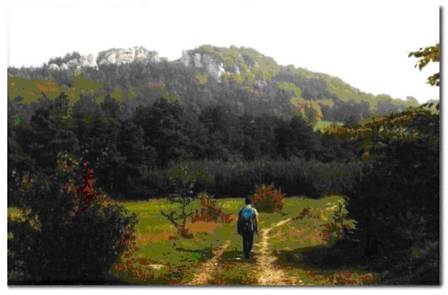
Final diagnosis	*Number of cases*	*Percent of total*
Tick-borne encephalitis	5	4,1%
Viral encephalitis, of unknown aetiology	16	12,3%
Viral meningitis, of unknown aetiology	24	17,2%
Neuroinfection of unknown origin	38	31,1%
Other neurological disorder	10	8,2%
Lyme borreliosis	6	4,9%
Bacterial meningitis and/or encephalitis	6	4,1%
Other diseases	7	5,7%
Pending diagnosis	10	8,2%

- Completeness of reporting varied in the studied region (Fig 2). Out of 177 cases reported from Upper Silesia in 2006, 83 (46.9%) were screened for TBE, and 5 were serologically confirmed.

Figure 2. Geographic distribution of undiagnosed meningitis and/or encephalitis cases, TBE, and completeness of case investigation, Upper Silesia, 2006.



- Among 5 diagnosed cases of TBE one case was exposed in the Warminsko-mazurskie endemic region of Poland and 4 cases were exposed locally.
- Among local cases there were 3 males and 1 female, their mean age was 34 years, 3 out of 4 lived in district Zawiercie, which includes a very popular forest and historical sites (*photo*).



Conclusions

- The results of the present study indicate that TBE is not widely present in the Upper Silesia region.
- One possible focus of the disease in the Zawiercie district has been identified, which requires further confirmation, for example by studying TBEV seroprevalence in ticks.
- Enforcement of diagnostic procedures in neuroinfection cases in Silesian hospitals is necessary, as well as advice for those living in or visiting the Zawiercie district.
- Possible limitation of this study could be uneven completeness of collected material, since in some regions only a small proportion of neuroinfection cases seen by a physician were investigated for TBE.