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### Seasonal variations of pneumococcal meningitis in 30 years: influence of atmospheric conditions

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**Background:** Knowledge of seasonal trends in incidence of pneumococcal meningitis may improve the understanding of factors which contribute to onset and development of the diseases.

**Methods:** Clinic for Infectious and Tropical Diseases in Belgrade is the biggest institution in the country where infections of central nervous system are treated. A database containing results of cerebro spinal fluid (CSF) cultures (January 1981- December 2010) from this Clinic was assembled. The database included monthly counts of inpatient CSF cultures positive for *Streptococcus pneumoniae*. Results of monthly measuring mean atmospheric parameters for the same period in Belgrade were obtained from national meteorological database.

**Results:** A total of 1068 inpatient CSF yielding bacterial pathogens, deemed to be causes of meningitis, were reported. Summer season (April-September) was associated with 19.64% fewer pneumococci (137) relative to winter (October-March, 204 isolates). Correlation analysis has been used to compare the total number of pneumococci in CSF and mean atmospheric parameters for each one of 12 months in 30 year period. Positive correlation has been proved with atmospheric pressure ( $R=0.724$ ,  $p<0.01$ ) and negative correlation with temperature ( $R= -0.751$ ,  $p<0.01$ ) and insolation ( $R= -0.759$ ,  $p<0.01$ ), while the correlation with monthly precipitation hasn't reached the level of statistical significance ( $R=0.417$ ,  $p>0.05$ ). Regression model of the occurrence of pneumococci in CSF revealed linear trend of growth,  $R$  square=0.319,  $p<0.01$ .

**Conclusion:** Winter season, higher mean atmospheric pressure and lower monthly outdoor temperature and insolation are associated with substantially increased frequency of pneumococcal meningitis.

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### Epidemiology, microbiology and mortality of community-acquired bacteremia in northeast Thailand: a multicenter population-based study

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**Background:** National surveillance on causes of death in developing countries is likely to be incomplete, and community-acquired bacteremia (CAB) is not currently listed as a major cause of death in Thailand.

**Methods:** The Bacterial Infection in Northeast Thailand Network was formed with the participation of all provincial hospitals in northeast Thailand. Routine microbiological and clinical databases of each hospital were used to examine the epidemiology of community-acquired bacteremia between 2004 and 2010. We defined CAB in patients who had pathogenic organisms isolated from blood within the first 48 hours after admission and had no hospitalization within the past 6 months. 28-day mortality outcome was determined through the hospital clinical databases and the death registry of the Ministry of Internal Affairs, Thailand.

**Results:** Using preliminary datasets obtained from Ubon Ratchathani, Yasothorn and Srisaket provinces, we identified 6,583 patients with CAB. The incidence of CAB increased from 15 to 35 per 100,000 person-years, and the population mortality rate from CAB increased from 5 to 15 per 100,000 person-years between 2004 and 2010. The most common pathogens were *Burkholderia pseudomallei* (22%), followed by *Escherichia coli* (21%), *Streptococcus* spp. (15%), *Staphylococcus aureus* (9%) and *Klebsiella pneumoniae* (6%). Only 58% of patients with *B. pseudomallei* bacteremia were assigned an ICD-10 diagnostic code for melioidosis. Outcomes for patients who died within 28 days after admission were documented in the hospital clinical databases as self-discharged against advice (1%), transferred to other hospitals (3%), improved (7%), refused treatment (31%) and died in hospital (58%).

**Conclusion:** The documented incidence of CAB in northeast Thailand has risen in the last 7 years, together with the number of associated deaths. In northeast Thailand, CAB is the second most common cause of death due to infectious diseases after only HIV/AIDS, and causes more deaths than tuberculosis. CAB is of major clinical and public health importance, and this study has demonstrated that national surveillance can be improved by using readily available databases.

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