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Time trend and seasonality of communityacquired bacteraemia in a Danish county as assessed from hospital registers

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Objectives: Origin of infection is an important distinction to make in bacteraemia research. Time trend and seasonality of community-acquired bacteraemia (CAB) have been ascertained in Denmark only for selected groups of pathogens. Therefore, we have done an 8-year register based study including all pathogens.

Methods: This retrospective study was done in North Jutland County (app. 490,000 inhabitants). Blood cultures (BCs) were processed by the Dpt. Clinical Microbiology, Aalborg Hospital. BCs were recorded as positive only if believed clinically relevant. Data on all BCs processed during 1995–2002 were retrieved from a departmental database and linked to date of admission by the unique Danish personal identification number. BCs drawn within 2 days of admission were deemed related to a community-acquired infection; likewise we took positive BCs within this time frame to indicate CAB. We analysed data graphically and by a log-linear model where time trend was fitted as a linear function and seasonality as a trigonometric function with a period of 1 year.

Results: The study base included 100,023 BCs. Of these 63,347 were potentially related to a community-acquired infection. Time trend was statistically significant with an annual increase of 6.9% (95% confidence interval (CI): 6.5–7.2%). There was a consistent seasonal pattern with 8–14% more BCs being obtained during the 1st quarter than during any other quarter of the year. A total of 6298 positive BCs (from 4833 patients) were obtained during the first 2 days of admission. Time trend was statistically significant with an annual increase of 6.0% (95% CI : 4.9–7.2%). Compared to the 1st quarter 7.7% more positive BCs were recorded in the 4^{th} quarter and 5.3% less in the 2^{nd} quarter; the 3^{rd} quarter was nearly at level with the 1^{st} (+2.3%). The peak-to-trough ratio was 1.10 (95% CI : 1.03–1.18). This had the consequencethat the rate of positive BCs was lowest in the 1^{st} and highest in the 3^{rd} quarter.

Conclusion: We demonstrated rising trends both for total numbers and numbers of positive BCs. Patterns of seasonality were markedly different: most BCs were drawn during the 1^{st} quarter, most positives were detected during the 4^{th} quarter and the rate of positive BCs was highest during the 3^{rd} quarter. Thus, both occurrence of CAB and the diagnostic efforts showed distinct annual variation.