

A decade of nation-wide fungaemia surveillance in Denmark: current status and major trends

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Objectives

Single or multicentre studies of fungaemia can be informative but population-based studies are more reliable concerning general trends and overall disease burden. We report data from an ongoing nationwide fungaemia surveillance programme in Denmark with emphasis on the two recent years 2012-13 and major trends and patient characteristics during the last decade.

Methods

The programme is based on voluntary referral of blood culture isolates from departments of clinical microbiology to the national referral centre, Statens Serum Institut, Copenhagen. Repeat isolated were included if >21 days had passed. Species identification was performed using classical techniques supplemented by ID32C assimilation tests and MALDI-TOF. Susceptibility testing was done according to EUCAST EDEF 7.2 except for amphotericin B where Etest was used.

Results

In 2012-13 961 patients were diagnosed with 998 unique episodes of fungaemia involving 1026 isolates (8.92/100,000 inhabitants). The overall episode rate was 19.4% higher in 2013 than 10 years earlier but remained stable compared to 2010-11. Men older than 80 years were an exception (59-69/100,000) (Fig). *C. albicans* accounted for 48.8% of yeast, but had declined from 52.1% in 2010-11 and 63.2% in 2004-5 (statistically significant, $P < 0.0001$). *C. glabrata* was second with 31.9%, up from 28.0% in 2010-11 and 18.3% in 2004-5. *C. krusei*, *C. parapsilosis* and *C. tropicalis* remained sparsely represented (4%). The species distribution was age-dependent with an increase of *C. glabrata* at the expense of *C. albicans* and *C. parapsilosis*. Above 50 years of age gender had a notable impact on the occurrence of *C. glabrata* (37.7% in women vs. 29.9% in men, $P = 0.02$).

Acquired echinocandin resistance was detected in 14 isolates including 10 *C. glabrata* (3.1%), two *C. krusei* (5.3%) and two *C. tropicalis* (4.7%) isolates and was molecularly confirmed in 12 isolates compared to three isolates in 2010-11. In contrast, no echinocandin resistant isolates were detected in 2004-7, and five such isolates were found in each of the two following periods 2008-9 and 2010-11 (Chi square for trend $P < 0.0001$). Amphotericin B susceptibility remained high (98.1%) whereas fluconazole susceptibility declined (60.4% compared to 66.7% in 2010-11). Nationwide antifungal use increased by 7%, 22%, 24% and 267% compared to 5 years earlier for echinocandins, fluconazole, voriconazole and posaconazole, respectively.

Conclusion

In Denmark, the incidence of fungaemia remains high with a further increase for *C. glabrata*. More echinocandin resistant isolates were detected which is concerning although numbers are small because only initial blood isolates are included the surveillance programme. Attempts to reduce the overall antifungal selection pressure and in particular longer-term echinocandin use should be explored.

Fig. Gender and age specific national incidence rates of fungaemia in 2012-13 in Denmark compared to 2010-11 and 2004-09.

