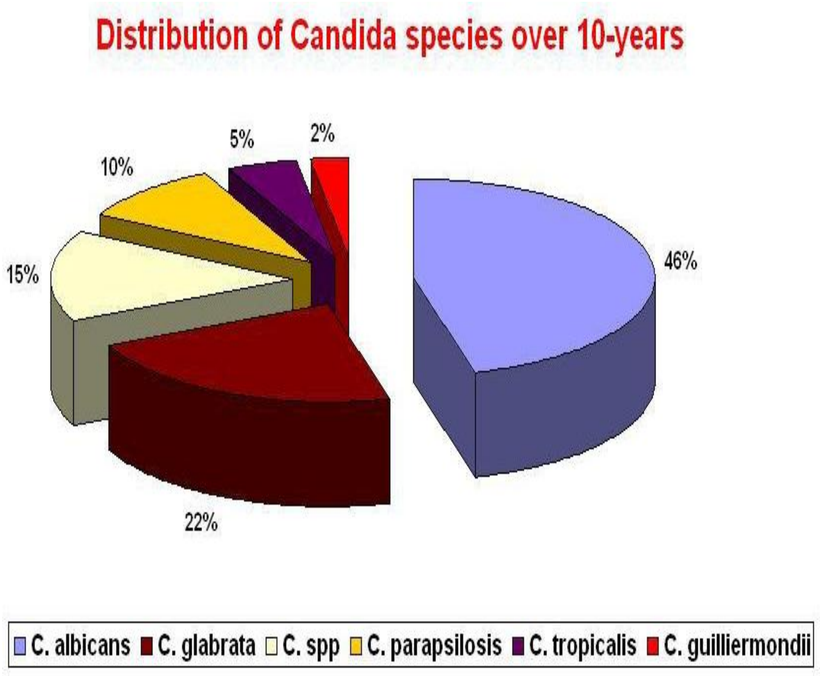
“Fungi and Finance” – A Project at a District Hospital in Northwest England for Cost-Effective Management of Candidaemia, Driving Quality and Efficiency

A Peel, A Guleri, S Ellershaw, A Ibrahim, M Przybylo – Blackpool Teaching Hospitals NHS Foundation Trust

BACKGROUND

Candida bloodstream infections [CBSI] are the 8th commonest cause of healthcare-acquired BSI in the United Kingdom[1], and are associated with high mortality and high potential treatment costs. The incidence of CBSI in Europe is 0.20 - 0.38/1,000 hospital admissions and 0.31 - 0.44/10,000 patient days[2]. Several authors and institutions have reported an increase in the proportion of infections caused by non-*Candida albicans* species. The cost of newer antifungals may erode drug budgets already stretched in a time of economic pressures. We present a project with potential for adoption at any district general hospital. This includes a review of local epidemiology and it’s influence on empiric drug choice; in-house *Candida* identification [CID] and fluconazole susceptibility testing [FST]; and cost comparisons between in-house versus outsourced testing, and antifungal drug regimes.

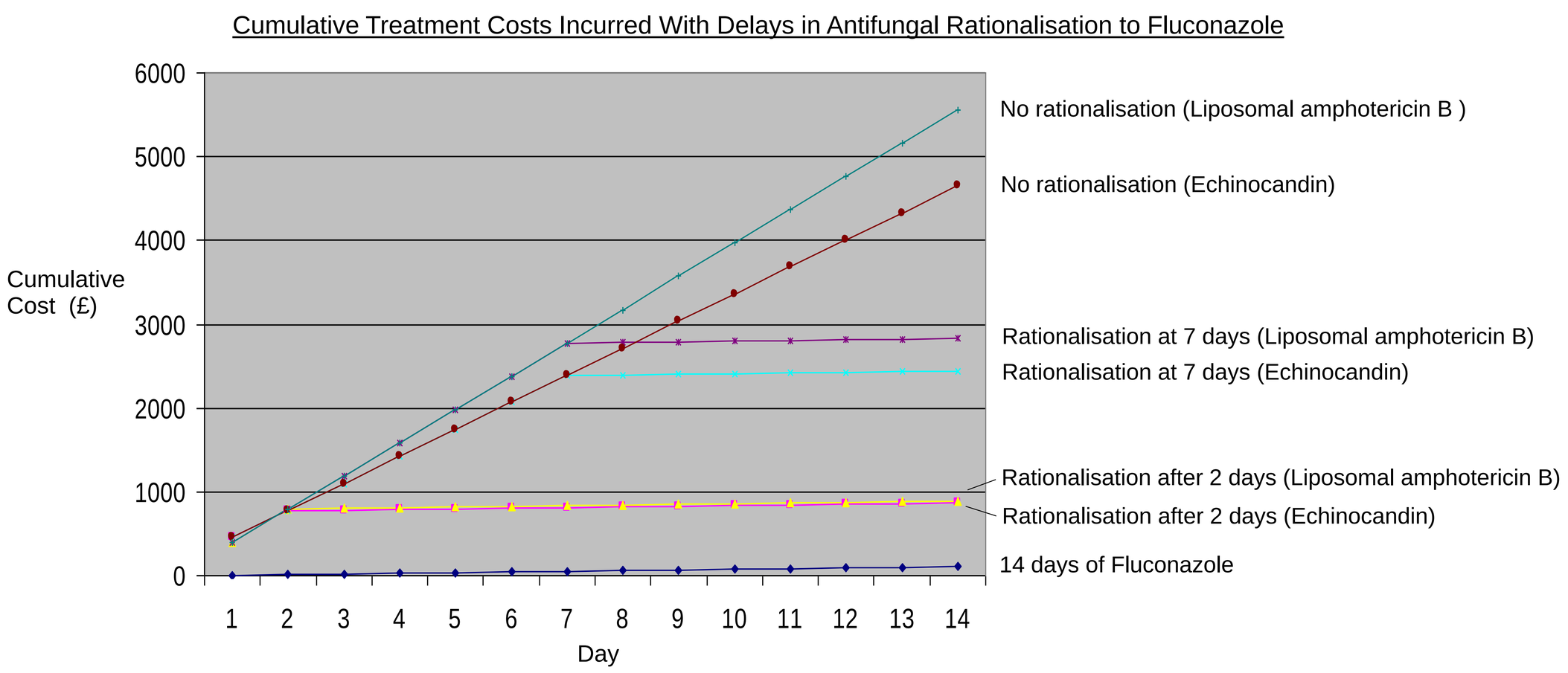


METHODS

A 10 year retrospective review of 272 CBSI (2002 to date) was undertaken. Antifungal sensitivity data was examined in light of the common use of fluconazole as empiric therapy for candidaemia in our institution. The current practice of performing mostly in house identification and sensitivity testing (ST) for *Candida* was reviewed. Comparison was made between in-house testing and outsourcing with reference to turn around time and laboratory costs. The potential cost savings from in-house ID/FST based antifungal treatment (allowing rapid switch to fluconazole if an initial broad spectrum agent had been started, especially for germ tube-negative *Candida*) were examined.

RESULTS

The most common species implicated in CBSI during the period was *Candida albicans* (48.5%), followed by *C glabrata* (23.5%), *C parapsilosis* (10.3%), and *C tropicalis* (5.1%). The relative proportions of these major groups of *Candida* remained constant over the period. There were no episodes of *C krusei* bloodstream infection. Isolates were fluconazole sensitive by the e-test method, with the exception of 39% of *C glabrata* (>32 mg/l). The cost differential between in-house CID/FST including staff time (£18.32) and outsourcing of CID/ST against the varying antifungal panels (£60.33 - £93.73) for 272 CBSI isolates would be between £11,426.72 and £20,511.52. Local CID/FST results are usually available within 48 hours, allowing rationalisation to fluconazole for sensitive isolates (the significant majority). This compares with the 5-10 days that results from outsourced testing may take to obtain (based on local experience when weekends, bank holidays, postage/courier limitations, and mixed cultures are accounted for). The graph below illustrates the significant savings with early stepdown from empiric broad spectrum antifungals to fluconazole. The cost of 14 days of fluconazole is also illustrated as this is an option for empiric therapy based upon our local epidemiology. (eBNF 2012 prices. Echinocandin cost is the mean of caspofungin, micafungin and anidulafungin, liposomal amphotericin B cost is the mean of AmBisome and Abelcet).



CONCLUSIONS

In-house *Candida* identification and fluconazole sensitivity testing is user friendly and easy to setup. Fluconazole MICs using E-tests can be available within 48 hours, allowing early switch from expensive 2nd/3rd line antifungals to fluconazole. Knowledge of our epidemiology also offers the option of fluconazole for empiric therapy in CBSI in selected patients, even for germ tube negative *Candida.* Clearly treatment decisions must always be made based on available evidence and individual patient circumstances, but clinicians should remain aware of the potential high costs of fungal diagnostics and treatments.

1. Partnership NINSS. Surveillance of hospital-acquired bacteraemia in English hospitals 1997e2002. London: Health Protection Agency; 2002.
2. Tortorano AM et al. Epidemiology of Candidaemia in Europe: Results of 28-Month European Confederation of Medical Mycology (ECMM) Hospital-Based Surveillance Study. *Eur J Clin Microbiol Infect Dis* 2004 Apr;23(4):317-22.

Blackpool Teaching Hospitals NHS Foundation Trust