

Introduction

Antimicrobial stewardship is an intervention to provide adequate treatment through a better selection of an antimicrobial agent, appropriate dosing, and a choice of administration routes as well as the proper duration of therapy. This will eventually lead to a better outcome by avoiding adverse side effects and reducing selection pressure on the organism to acquire resistance.

Methods

We set up an antifungal stewardship (AFS) programme in 2015-2016 at Southend Hospital. A quasi-experimental study was conducted to compare the cost of antifungals in pre-intervention (July 2013 to June 2014) to post-intervention (August 2015 to July 2016). It included all high-cost antifungals i.e., anidulafungin, amphotericin, voriconazole, posaconazole and parenteral fluconazole.

AFS principles also emphasise to develop subject related competencies in the prescribers. We developed antifungal guidelines and also arranged small group teaching to refresh and update the junior doctors.

We used increased fungal testing and biomarkers like galactomannan and 1,3-BD-glucan. Stewardship ward rounds helped switching to narrow spectrum/low-cost antifungals alongside returning the unused stock to the pharmacy.

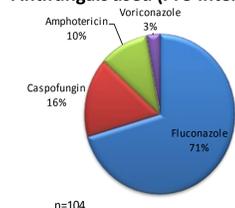
Results

The total number of antifungal prescriptions (expressed in defined daily doses (DDDs)) dropped by 30% in the post-intervention period. Our dedicated team stopped inadequate prescriptions including empiric and unknown treatment after negative results.

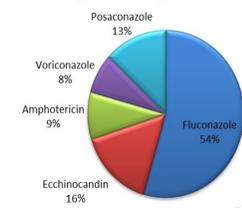
Cost

Reduction in DDDs/1000 bed days saved the Trust the sum of £58,898 in the post-intervention period. The savings could have been increased by £21,206, but this was lost through the outpatient prescriptions for expensive posaconazole and unnecessary prolonged duration of antifungals which had been missed.

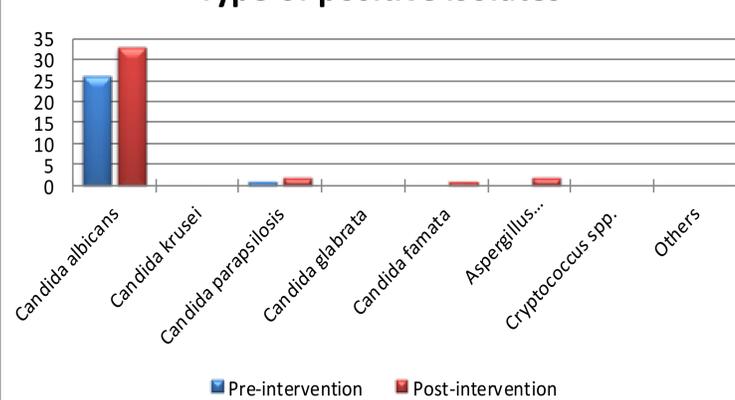
Antifungals used (Pre-intervention)



Antifungals used (Post-intervention)



Type of positive isolates



Discussion

ESPAUR (English Surveillance Programme for Antimicrobial Utilisation and Resistance) has increased its surveillance to include antifungals due to increased reporting of antifungal resistance nationally³. All of our candida isolates were fully susceptible to all antifungals. *Candida spp* was the 11th most commonly isolated organism in the UK during 2014³. In our study, we also observed a rising incidence of *C. albicans* from 25% to 33% likely due to increased number of immunosuppressed patients⁴.

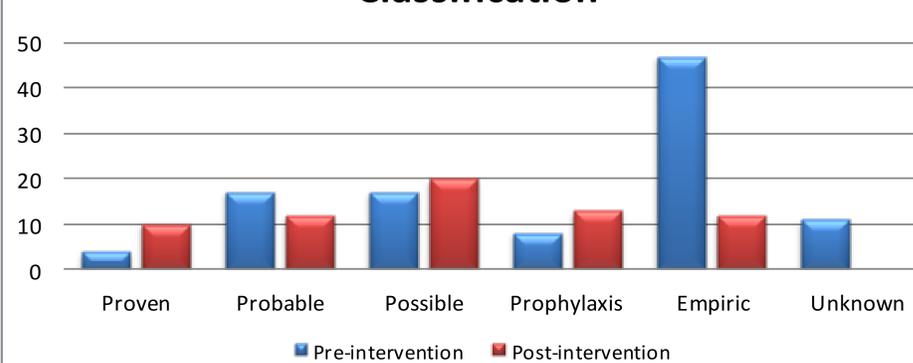
Our AFS programme helped in reducing the number of empiric and unknown treatment¹. It eventually decreased DDDs/1000 admission² and antifungal cost in post intervention period. Similar findings have been observed in another national AFS programme⁵.

Conclusion

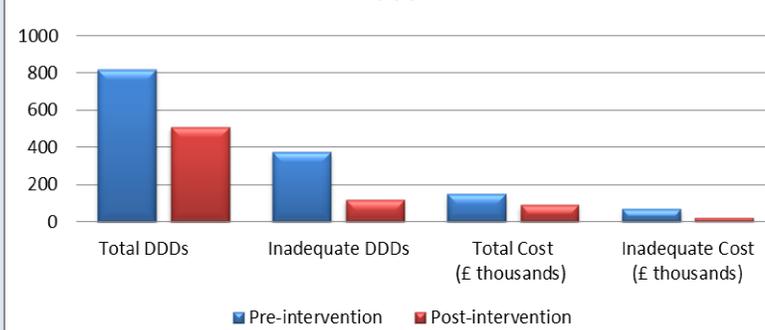
This study highlighted the cost-effectiveness of AFS, whilst ensuring optimisation of therapy and patients' safety. However, the study was limited in other parameters such as, increased cost of fungal diagnostics, and mortality/morbidity which were not analysed.

NHS Trusts have a lot to gain by having a dedicated AFS team. However, limitations of AFS include a lack of staff engagement, lack of technical expertise (antifungal specific) and unavailability of diagnostic resources in all laboratories. In future, we aim to continue our AFS programme with better engagement of multidisciplinary teams through in-house training and rapid access to diagnostic resources.

Invasive fungal infection (IFI) Classification



Antifungal uses expressed in DDDs and Cost



References

- Ben De Pauw, B., Walsh, T.J., Donnelly, J. P., 2008. Revised definitions of invasive fungal disease from the European Organization for Research and Treatment of Cancer/Invasive Fungal Infections Cooperative Group and the National Institute of Allergy and Infectious Diseases Mycoses Study Group (EORTC/MSG) Consensus Group. *Journal of Clinical Infectious Disease*, 46, pp.1813-21.
- WHO Collaborating Centre for Drug Statistics Microbiology, 2016. ATC/DDD Index 2016 Available from; http://www.whocc.no/atc_ddd_index/, Accessed on 15th April at 0900
- Public Health England; English surveillance programme for antimicrobial utilisation and resistance (ESPAUR) report 2016. Available at; <https://www.gov.uk/government/publications/english-surveillance-programme-antimicrobial-utilisation-and-resistance-espaur-report>, retrieved on 13th April, 2017 at 1200 hours
- Schelenz S et al., 2015. British Society for Medical Mycology best practice recommendations for the diagnosis of serious fungal diseases. *Lancet Infect Dis*, Apr,15(4), pp. 461-74. doi: 10.1016/S1473-3099(15)70006-X. Epub 2015 Mar 12
- Micallef, C., et al., 2015. Introduction of an antifungal stewardship programme targeting high-cost antifungals at a tertiary hospital in Cambridge, England. *J Antimicrob Chemother*, 70, pp. 1908-1911

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