Epidemiology of candidemia in Kuwait: a population-based study

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Background

- Invasive fungal infections have increased significantly in the last few decades coinciding with the concomitant rise in the immunocompromised population.
- The burden of invasive fungal infections in Kuwait is unknown.
- In this nationwide study, we explored the epidemiology of candidemia in Kuwait during the year 2018.

Methods

- This is a prospective laboratory-based study including eight major hospitals and four tertiary care hospitals who submitted their Candida bloodstream isolates to Mycology Reference Laboratory (MRL).
- The incidence of candidemia was determined using 100,000 inhabitants as denominator.
- Demographic details were collected from all patients at the onset of candidemia.
- For each episode, only the first blood culture isolate was considered.
- All isolates were identified to species level by phenotypic methods, VITEK 2 and or MALDI-TOF MS.
- Identity of Candida auris isolates was confirmed by PCR/PCR-sequencing of ITS region of rDNA. Antifungal susceptibility testing was performed by E test.

Results 1

- Yeast blood isolates (n=313) were submitted to MRL. After excluding duplicate isolates and non-Candida yeasts, 243 Candida spp. isolates obtained from 227 patients were analysed.
- The number of candidemic episodes was 238. Five patients had candidemia due to two different species, and re-infection was recorded in 11 patients.
- The incidence of candidemia was 5.4 cases per 100,000 inhabitants.
- More (56%) male patients were affected.
- Age distribution was bimodal, mainly involving extremes of age. Among infant patients, ~10% were twins.

Results 2

- With regard to the type of patients involved, around 50% of patients were staying in ICU, followed by medical, paediatric and surgical patients.
- Concerning the distribution of Candida species, C. albicans isolates accounted for only one third of the cases (30%), followed by C. parapsilosis (22%), C. tropicalis (14%), C. krusei (13.5%) and C. glabrata (13.5%).
- Uncommon Candida species constitute 6% of all Candida isolates, and include C. Anulata, C. utilis, C. Lusitaniae, C. dubliniensis, C. guilliermondii, C. pelliculosa, and C. blankii.

Results 3

- All Candida spp. isolates were susceptible to amphotericin B, except C. auris, where 27% were resistant. Caspofungin also exhibited excellent in-vitro activity against almost all Candida spp. isolates. Fluconazole susceptibility was related to Candida species. Fluconazole resistance was low (1%) in C. albicans but 16% in C. parapsilosis isolates were resistant. In C. glabrata, 10% isolates were resistant and the rest were susceptible-dose dependent. All C. auris isolates were highly resistant to fluconazole.

Conclusions

- The actual incidence of candidemia for the whole population in Kuwait is presented.
- The species distribution has changed remarkably, and C. auris has become the fourth common cause of candidemia.
- Fluconazole resistance is rising especially in C. parapsilosis, and resistance to amphotericin is significant in C. auris.
- The results of this study could help informing decisions regarding planning, allocation of resources and antimicrobial stewardship.