Species specific Beta-D glucan levels at the time of candidemia

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Objectives

- Beta-D glucan levels are increasingly being used for early detection of candidemia
- Different fungi have different amounts of BDG in their cell walls. It would be useful to know whether the species causing candidemia differ with respect to the amount of BDG released in circulation.
- Here we analyze the levels of beta D glucan (BDG) specific to different candida species at the time when the patient was candidemic.
- Our second objective was to determine whether BDG levels in *C. auris* candidemia differed from those in non-*C. auris* candidemia

Methods

- Aga Khan University Clinical Laboratory records from Jan 2015-Dec 2016 were retrospectively reviewed for blood cultures positive for *Candida* species.
- A total of 149,040 blood cultures were sent from patients registered with AKU Hospital. Of these, 402 (0.27%) were positive for *Candida* species.
- After removing duplicates, 286 episodes of candidemia were identified, of which only 39 had a concomitant BDG level tested within 5 days before to 14 days after candida was isolated from blood culture (i.e. -5 to +14 days of candidemia). Thus, only these BDG levels were considered representative of the candidemia episode. (1,2)
- Most *Candida* species were identified using API 20C AUX (bioMérieux, France) and colony and microscopic morphology.

- C. auris* was presumptively identified according to its API profile number, fluconazole resistance, colony and microscopic morphology (3).
- BDG levels were performed using Fungitell® (Associates of Cape Cod, Falmouth, MA, USA) kits and according to manufacturer's instructions.
- The data was retrieved and cleaned on Microsoft Excel 2010 and transferred to Stata version 12 for analysis. Frequencies, mean and SD were determined. One-way ANOVA was used to test the hypothesis that BDG levels differ with species causing candidemia. Student's t-test for unpaired data used for determining whether BDG levels in *C. auris* candidemia differed from those in non-*C. auris* candidemia.

Results

- Amongst the 39 candidemia episodes with concomitant BDG levels determined, male to female ratio was 2.3; 31% patients were children and 69% adults, mean age 36.3 y (SD=24).
- Of the 39 episodes, 28% were with *C. parapsilosis*, 23% *C. albicans*, 20.5% *C. auris*, 12.8% *C. tropicalis*, 10% *C. pelliculosa* and 5% rare species. Only 69.2% of the episodes had BDG levels ≥ 80 pg/ml.
- There was no difference in the mean BDG levels between the species nor between *C. auris* and non-*C. auris* groups (Table, Boxplot)

Conclusion

With this limited data, we were unable to demonstrate any difference in serum BDG levels specific to *Candida* species in candidemic patients.

Table: Species-specific mean beta-D glucan levels determined in patient sera within (-5 to +14) days of candidemia

Species	Frequenc y	BDG pg/ml mean (SD)	Species (n)	BDG pg/ml Mean (95%CI)
<i>Candida auris</i>	8	202.4 (157.7)	<i>Candida auris</i> (8)	202.4 (145.7-298.9)
<i>C. parapsilosis</i>	11	209.7(227.2)	Non- <i>C. auris</i>	222.3 (70.6-334.2)
<i>C. albicans</i>	9	224.7 (221.5)	<i>Candida</i> species (31)	
<i>C. tropicalis</i>	5	215.9 (203.6)		
<i>C. pelliculosa</i>	4	209.5 (227.2)		
<i>C. lusitaniae</i>	1	523.4 (-)		
<i>C. guilliermondii</i>	1	120.6 (-)		
No difference in groups detected (ANOVA p=0.867)			No difference in groups detected (t-test p=0.250)

References:

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