

An audit of ophthalmological examination of patients with candidemia; is fundoscopy performed at the correct time?

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INTRODUCTION AND PURPOSE

- Candidemia can cause endophthalmitis and chorioretinitis resulting in significant visual loss.
- Detection of ocular candidiasis is crucial for proper management of the patient as this may require longer course of systemic therapy, surgery and local therapy.
- However ocular candidiasis is often asymptomatic and the lesions do not always appear immediately after candidemia is detected, as they require some time to evolve and become visible.
- Several studies showed that patients may develop ocular candidiasis during antifungal treatment and suggested to perform fundoscopy at least 7 days after the onset of therapy or to perform follow up in patients with negative ophthalmological screening examination.^{1,2}
- The Infectious Diseases Society of America recommends that all patients with candidemia undergo dilated ophthalmological evaluation and that this is performed when the candidemia is controlled.³

The aim of this audit is to review the current practice in performing ophthalmological examination in patients with candidemia at our institution and to make recommendations to ensure that all patients have fundoscopy at the correct time.

METHODS

Definition

- Candidemia** was defined by a blood culture yielding *Candida* spp. or yeast. Isolates were identified by MALDI-TOF mass spectrometry.
- Clearance of candidemia** was defined by the first negative blood culture. Negative reports are issued after 5 days of incubation.

Methods

- The medical records of all patients with documented candidemia between 1st January 2012 and 1st April 2013 at St George's Hospital in London, United Kingdom were retrospectively reviewed.
- The clinical notes of the patients and a departmental microbiology database for positive blood cultures were used to evaluate the role of the microbiology department in advising fundoscopy, whether or not the examination was performed and what the findings were.
- The date of the fundoscopy was compared to the date of the clearance of candidemia.

RESULTS

1. Population and pathogen

A total of 22 patients were identified and studied. The patient and pathogen characteristics are given respectively in Table 1 and Figure 1.

Table 1. Baseline characteristics of 22 patients with candidemia

| | No. (%) |
|---|-----------|
| Median age (range) | 54 (0-82) |
| Male gender | 13 (59%) |
| Intravascular devices | 18 (81%) |
| Neutropenic | 1 (5%) |
| Main underlying disease | |
| - Abdominal surgery | 7 (32%) |
| - Heart surgery | 5 (23%) |
| - Other surgery / urinary tract procedure | 2 (10%) |
| - Haematology | 1 (5%) |
| - Premature | 1 (5%) |
| - Other | 6 (27%) |
| <small>(Ohtahara Syndrome, Hyperglycaemic Hyperosmolar State, enterocutaneous fistula, hydranitis suppurativa, DM and obesity, urosepsis)</small> | |

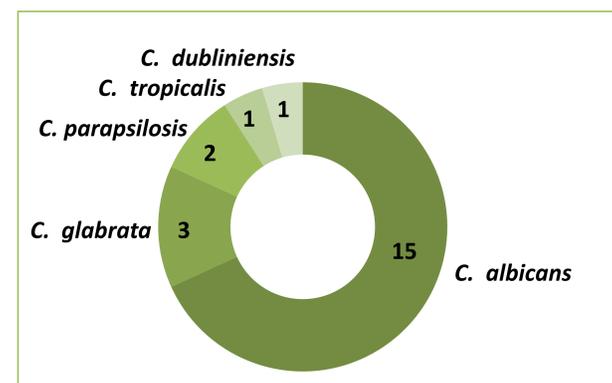
Patient location at time when blood culture was taken

- Adult Intensive Care Unit 14 (63%)
- Paediatric Intensive Care Unit 1 (5%)
- Neonatal Unit 1 (5%)
- Surgical departments 3 (14%)
- Medical departments 2 (9%)
- Accident & Emergency 1 (5%)

Number of positive blood cultures per patient

- 1 pos blood culture 13 (59%)
- 2 positive blood cultures 5 (23%)
- ≥6 positive blood cultures 4 (18%)

Figure 1. Pathogen characteristics



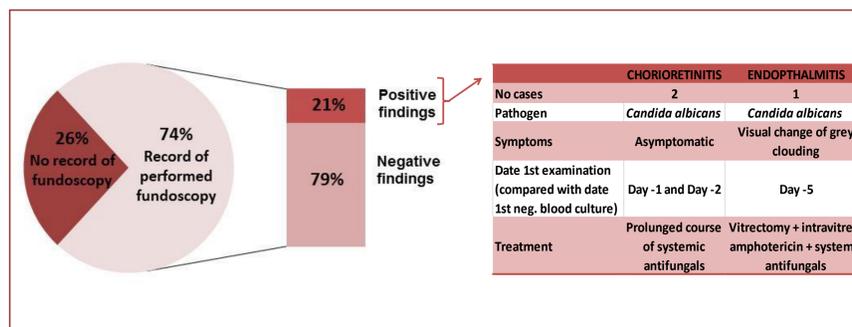
2. Microbiology team role

- When communicating positive results, the Microbiology team advised ophthalmological examination in 19/22 cases; 2 patients were for palliative care and 1 patient died by the time the blood culture flagged positive.
- In 17/19 cases (89%) the advice was given within 48 hours from the time the blood culture flagged positive.
- In none of the 19 cases was it specified to perform fundoscopy after the clearance of candidemia.

3. Ophthalmological examination findings

- Records of ophthalmological examination were found in 14/19 cases (74%) (Figure 2).
- 11/14 patients (79%) had negative findings and 3/14 (21%) had findings consistent with ocular candidiasis (Figure 2).
- Ophthalmological examination was not repeated in any of the patients with a negative examination

Figure 2. Distribution of the 19 cases which received advice to perform an ophthalmological examination and description of the cases with positive findings

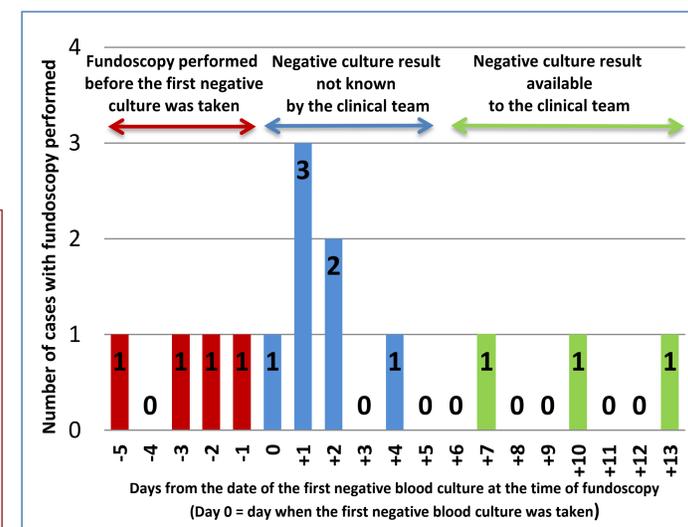


4. Timing of ophthalmological examination

The comparison of the date of fundoscopy with the date of clearance of candidemia (Figure 3) showed that:

- In 4/14 (29%) cases the ophthalmological examination was performed before the date of the first negative blood culture
- In 7/14 cases (50%) within 5 days from the date of the negative blood culture (therefore before the negative report was released)
- In 3/14 cases (21%) 5 days after the date of the negative blood culture.

Figure 3. Comparison of the date of the ophthalmological examination with the date of clearance of candidemia



CONCLUSION

Our audit showed poor compliance with published standards especially in performing fundoscopy at the time of the clearance of candidemia.

The results allowed us to define new local recommendations, with the Microbiology team playing a key role in ensuring standards are met:

- The Microbiology team will advise the clinical team to perform fundoscopy after the first negative blood culture report is available. The soonest the ophthalmological examination could be performed, would be day +6/+7 assuming the first repeated blood culture has been taken at day +1/+2 and is negative (the report is released after 5 days incubation).
- An early eye examination will be advised for symptomatic patients and patients unable to report visual impairment. This is to avoid delays in the surgical and topical treatment of the endophthalmitis cases which are likely to be symptomatic. In case of negative early examination, fundoscopy will be repeated after 7 days.

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