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Efficacy of a "check-list" intervention bundle on the clinical evolution of patients with Candida bloodstream infections

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Background: Candidemia is associated with significant morbidity and mortality that may benefit from regular ID consultation and antifungal stewardship recommendations. However, those recommendations are not always carried out in due time, despite such programs. The objective of this study was to evaluate the clinical impact of implementing routine stewardship measures with a bedside check list care bundle immediately after the detection of candidemia.

Material/methods: The control cohort included patients with candidemia from January 2011 to December 2014. During this period a non-restrictive antifungal stewardship programme was implemented in our hospital. Patients with candidemia were visited by an ID specialist as soon as possible who provided diagnostic and therapeutic advice. The incidence of candidemia during this period was 1.36 cases per 1,000 admissions. The intervention cohort included all cases with candidemia from January 2015. Patients were routinely and immediately visited by the same physician who discussed at the bedside the case with the physician in charge. The bundle of care was systematically applied to all adult patients with candidemia. The incidence of candidemia during this period was 1.12 cases per 1,000 admissions and the candidemic patients were in more severe

conditions than in the control cohort.. The intervention consisted of six recommendations provided in a structured form and checked with a list that included: early adequate antifungal therapy, follow-up blood cultures (within day 3 to 5), source control in the first 72 h, if necessary, ophthalmologic examination, echocardiogram, and a proposal for duration of therapy with an end in a fixed day. Patients who died in the first 72 hours (not subject to intervention) and patients receiving palliative care for terminal conditions were excluded from both cohorts. A quasi-experimental design was used and cases were compared to controls.

Results: The study population consisted of 56 cases and 112 controls. The intervention was independently associated with improved adherence to early effective antifungal therapy (83.9% vs 94.6%, $p=0.05$), follow-up blood cultures (76.5% vs 98.2%, $p<0.001$), 72 h-source control (63.1% vs 68.1%, $p=0.5$), ophthalmologic examination (68.8% vs 100%, $p<0.001$), echocardiogram (82.1% vs 100%, $p<0.001$), and appropriate duration of therapy (45.6% vs 74.1%, $p=0.001$). Full adherence to all indicators increased from 17% to 50%, $p=0.001$. Overall, 14-day all-cause mortality (attributable mortality) was significantly reduced (16% vs 3.5%, $p=0.01$) and the candidemia bundle was an independent good prognostic factor (OR [IC 95%] 0.25 [0.05-0.98], $p=0.05$). No significant difference was found in mortality occurring between days 15 and 30 (non-attributable) mortality (16% vs 25.8%, $p=0.17$).

Conclusions: Reinforcement of routine antifungal stewardship program with a simple check list bundle, focused on increasing adherence to a few evidence-based interventions, provided bedside immediately after the diagnosis of candidemia was able to further reduce 14-day (related) mortality in patients with candidemia.