

LETTER



De-escalation of antimicrobial therapy in critically ill hematology patients: a prospective cohort study

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Dear Editor,

De-escalation of empirical antimicrobial therapy (EAT) may help reduce the spread of antimicrobial resistance and the side effects and costs of antibiotics [1]. A randomized trial confirmed that de-escalation did not result in worse outcomes for ICU patients [2]. Indeed, physicians may be reluctant to de-escalate antibiotics in the most fragile patients, even though some centers reported that de-escalation was performed routinely in neutropenic and non-neutropenic ICU cancer patients without affecting their prognosis [3, 4].

The present report describes the prevalence of de-escalation and factors associated with in the Trial-OH study, a prospective cohort of hematology patients admitted to the ICU [5]. De-escalation was only evaluated during ICU stay in patients without antibiotics at ICU admission and receiving EAT in the ICU. De-escalation was defined either by the cessation of a β -lactam or a glycopeptid or by the switch from a β -lactam to another one with a narrower spectrum before the fifth day. The β -lactams were classified in order of narrower spectrum as follows: carbapenems, piperacillin/tazobactam, ceftazidime or cefepime, piperacillin or ticarcillin, cefotaxime or ceftriaxone, other penicillins.

Among the 1011 patients from the prospective cohort, 124 patients were included. The study flow chart and

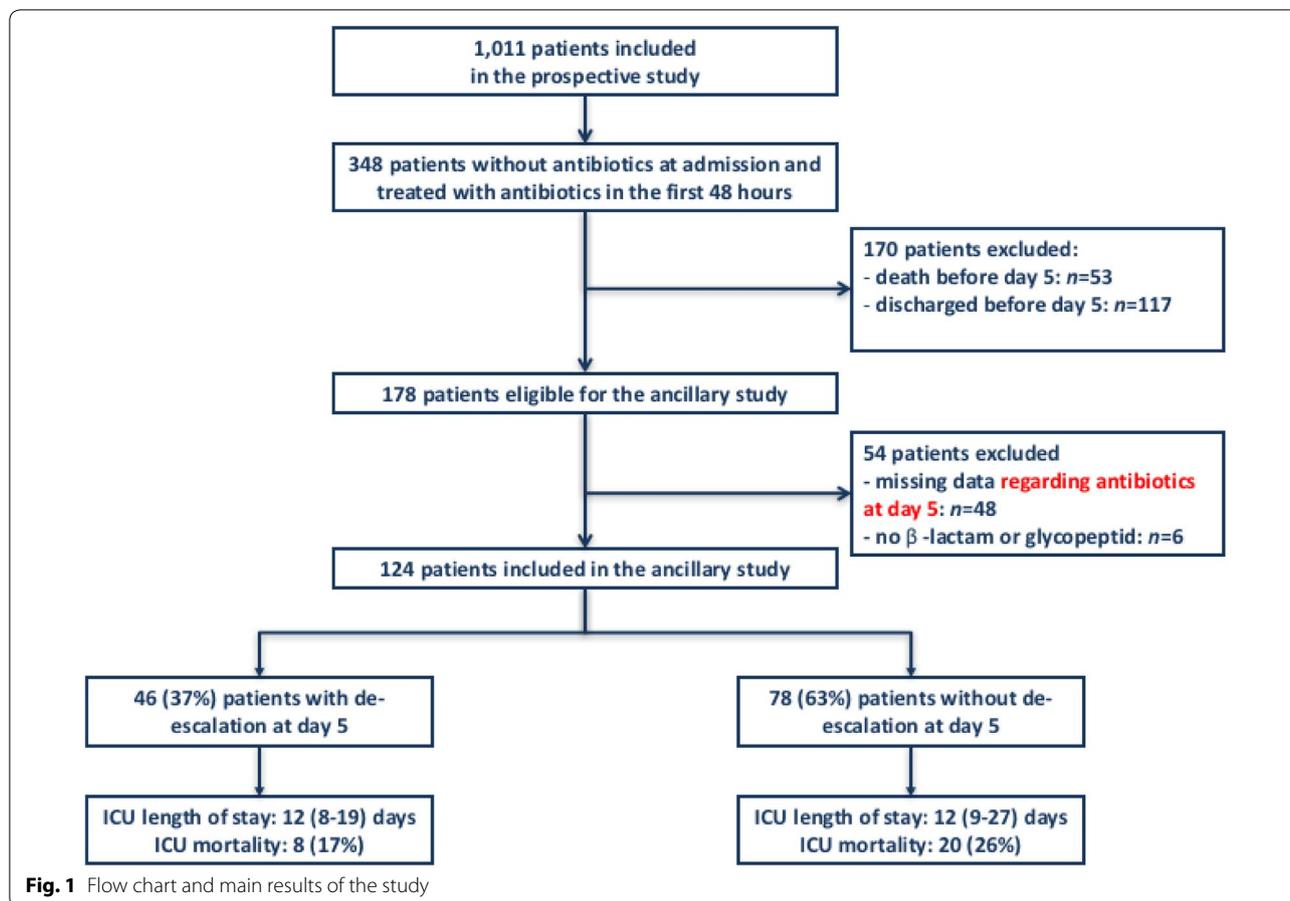
main results are displayed on Fig. 1. In the whole cohort, 28 (23%) patients died in the ICU and 43 (35%) in the hospital. The EAT consisted in a β -lactam in 122 (98%) patients and a glycopeptide in 21 (17%), combined to a β -lactam in 19 (90%). Patients received these antibiotics alone or in combination with other antibiotics (Table S1, online supplementary material). The EAT was de-escalated before day 5 in 46 (37%) patients. Baseline characteristics, comorbidities and underlying malignancies status were not statistically different in patients with and without de-escalation (Table S2, online supplementary material). At admission, no statistical differences regarding organ failures and the Sepsis Organ Failure Assessment (SOFA) score [7 (3–10) in the de-escalation group vs. 6 (4–8), $P=0.55$] were observed between groups (Table S3, online supplementary material). From day 1 to day 3, the evolution of SOFA score [0 (–4 to –3) in the de-escalation group vs. 0 (–2 to –1), $P=0.78$] and the rate of neutropenia recovery [6 (35%) vs 6 (55%), $P=0.44$] were not different. At day 5, SOFA score ($P=0.13$) and neutropenia rate ($P=0.61$) were also not different. Finally, ICU mortality [8 (17%) in de-escalation group vs. 20 (26%), $P=0.38$] and hospital mortality [12 (26%) vs. 31 (40%), $P=0.17$] were not statistically different, even after adjustment for confounders.

The rate of de-escalation was high in this cohort of hematology patients admitted to the ICU and did not seem to adversely affect the outcome of these high-risk patients. This statement may however be taken with caution given the observational design of the present study, the potential improvement of ICU prognosis in recent years, and especially in the neutropenic patients given

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their low rate in the present cohort. The DÉPOH study (NCT03683329) has been specifically designed to prospectively evaluate the impact of de-escalation on the outcome of septic ICU onco-hematology patients.

Electronic supplementary material

The online version of this article (<https://doi.org/10.1007/s00134-019-05554-9>) contains supplementary material, which is available to authorized users.

Abbreviations

EAT: Empirical antimicrobial therapy; GCSF: Granulocyte colony-stimulating factor; ICU: Intensive care unit; SOFA: Sepsis organ failure assessment; WBC: White blood cell.

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Compliance with ethical standards

Conflicts of interest

The author(s) declare that they have no competing interests.

Ethical approval

The study was approved by the appropriate ethics committees in France and Belgium. All patients or relatives were informed and consented to participate in the study.

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