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Association between mRNA expression of CD74 and IL10 and risk of ICU-acquired infections - a multicentre cohort study

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Background: Intensive care unit (ICU)-acquired infections (IAI) result in higher ICU length of stay, costs and mortality. No biomarker showed sufficient evidence and ease-of-use application in clinical routine for the identification of patients at risk of IAI. We evaluated the association of the systemic mRNA expression level of two host response biomarkers, CD74 and IL10, with IAI occurrence in a large cohort of ICU patients.

Material/methods: ICU patients were prospectively enrolled in a multicentric cohort. Whole blood was collected at the day of admission (D1), day 3 (D3) and day 6 (D6) after admission. Patients were daily screened for IAI occurrence, and data censored after IAI diagnosis. mRNA expression levels of biomarkers were measured using RT-qPCR. Fine and Gray competing risk models were used to assess the association between gene expression and IAI occurrence.

Results: A total of 725 patients were analyzed. At least one IAI episode occurred for 137 patients (19%). After adjustment on shock and sepsis status at admission, CD74 and IL10 levels were found significantly associated with IAI occurrence (subdistribution hazard ratio [Interquartile range] 0.67 [0.46-0.97] for CD74 D3/D1 expression ratio and 2.21 [1.63-3.00] for IL10 at D3). IAI cumulative incidence was significantly different between groups stratified on CD74 or IL10 expressions (Gray test $p=0.0005$ and $p<0.0001$, respectively).

Conclusions: Our results suggest that two immune biomarkers, CD74 and IL10, could be relevant tools for the identification of IAI risk in ICU patients.