Crit Care 2007;11(3):R62

Nucleated red blood cells in the blood of medical intensive care patients indicate increased mortality risk: a prospective cohort study

Stachon A, **Segbers E**, **Holland-Letz T**, **Kempf R**, **Hering S**, **Krieg M**.

Institute of Clinical Chemistry, Transfusion and Laboratory Medicine, BG-University Hospital Bergmannsheil, Buerkle de la Camp-Platz 1, Ruhr-University Bochum, 44789 Bochum, Germany

INTRODUCTION: In critically ill patients, the appearance of nucleated red blood cells (NRBCs) in blood is associated with a variety of severe diseases. Generally, when NRBCs are detected in the patients' blood, the prognosis is poor. METHODS: In a prospective study, the detection of NRBCs was used for a daily monitoring of 383 medical intensive care patients. RESULTS: The incidence of NRBCs in medical intensive care patients was 17.5% (67/383). The mortality of NRBC-positive patients was 50.7% (34/67); this was significantly higher ($p < 0.001$) than the mortality of NRBC-negative patients (9.8%, 31/316). Mortality increased with increasing NRBC concentration. Seventy-eight point six percent of the patients with NRBCs of more than 200/microl died. The detection of NRBCs is highly predictive of death, the odds ratio after adjustment for other laboratory and clinical prognostic indicators being 1.987 ($p < 0.01$) for each increase in the NRBC category (0/microl, 1 to 100/microl, 101 to 200/microl, and more than 200/microl). Each step-up in the NRBC category increased the mortality risk as much as an increase in APACHE II (Acute Physiology and Chronic Health Evaluation II) score of approximately 4 points. The mortality of patients who were NRBC-positive on the day of relocation from the intensive care unit to a peripheral ward was 27.6% (8/27). This was significantly higher than the mortality of patients who were NRBC-negative on the relocation day (8.6%, 28/325; $p < 0.01$). On average, NRBCs were detected for the first time 14 days (median, 3 days) before death. CONCLUSION: The routine analysis of NRBCs in blood is of high prognostic power with regard to mortality of critically ill patients. Therefore, this parameter may serve as a daily indicator of patients at high mortality risk. Furthermore, NRBC-positive intensive care patients should not be relocated to a normal ward but should obtain ongoing intensive care treatment.

PMID: 17550592 [PubMed - indexed for MEDLINE]