Introduction: For critically patients, enteral immunonutrition results in notable reductions in infections and in length of stay in hospital, but not on mortality, raising the question as to whether this relate to the heterogeneous nature of critically ill patients or to the absence of the altered absorption of specific nutrients within the immunonutrient mix (e.g. iron). Immune-associated functional iron deficiency (FID) is not only one of the many causes or anaemia in the critically ill, but also a cause of inappropriate immune response, leading to a longer duration of episodes of systemic inflammatory response syndrome and poor outcome. 

Objective: This prospective cross-sectional study was undertaken to assess the prevalence of FID in critically ill patients during their stay in intensive care (ICU) in order to find the more appropriate population of patients that can benefit from iron therapy. 

Method: Full blood cell counts, including reticulocytes (RETIC), serum iron (SI), transferring levels (TRF) and saturation (satTRF), serum TFR receptor (sTfR), ferritin (FRT) and C-reactive protein (CRP) were measured in venous blood samples from 131 random patients admitted to the ICU for at least 24 h (Length of ICU stay, LIS; min: 1 day; max: 38 days). Results: Anaemia (Hb < 12 g/dL) was present in 76% of the patients (Hb < 10 g/dL in 33%), hypoferremia (SI < 45 g/dl) in 69%; satTRF < 20% in 53%; FRT < 100 ng/mL in 23%; sTfR > 2.3 mg/dL in 13%; and CRP > 0.5 mg/dL in 88%. Statistically significant correlations (r of Pearson; *p < 0.05, **p < 0.01) were obtained for serum CRP levels and WBC**, Hb*, TRF**, satTRF*, and FRT**. There was also a strong correlation between TRF and FRT (-0.650**), but not between FRT and satTRF or SI. LIS correlated with Hb*, CRP**, TRF*, satTRF* and FRT**. 

Conclusion: A large proportion of critically ill patients admitted to the ICU presented the typical functional iron deficiency (FID) of acute inflammation-related anaemia (AIRA). This FID correlates with the inflammatory status and the length of stay at the ICU. However, 21% of the ICU patients with AIRA had an associated real iron deficiency (satTRF < 20; FRT < 100 and sTfR > 2,3). Since oral supplementation of iron seems to be ineffective, all these patients might benefit of iv iron therapy for correction of real or functional iron deficiency, which in turn might help to ameliorate their inflammatory status.

Keywords