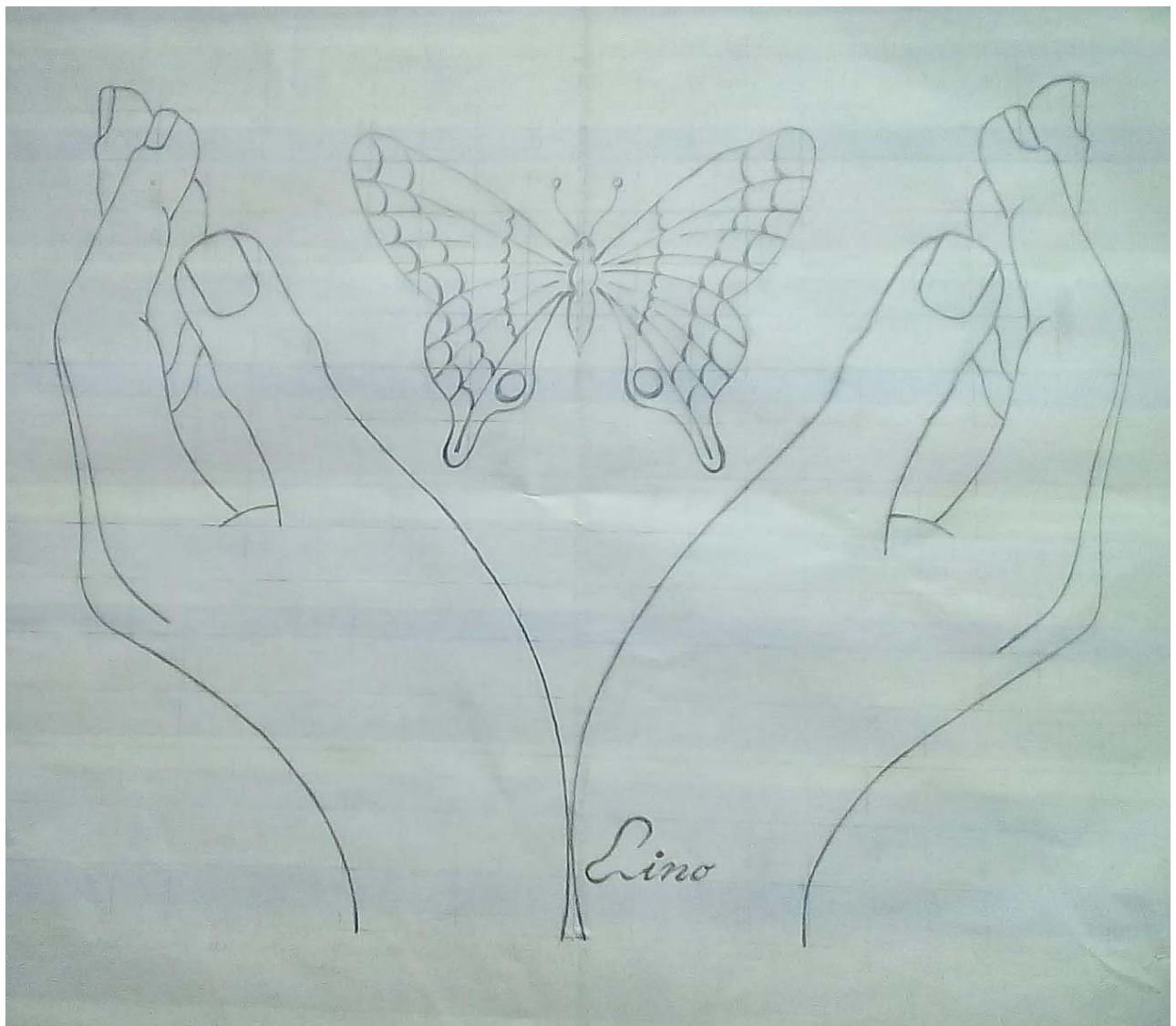


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# Clinical aspects of anemia in CKD patients in ESRD status: A clinical study

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**KEY-WORDS:** CKD, ESRD, Anaemia

## ABSTRACT

**Background:** Anemia is a prevalent condition in patients with chronic renal failure, especially in end-stage patients, corresponding to phase V of the international classification of renal failure (ESRD, End Stage Renal Disease), i.e. individuals with a glomerular filtration rate equal to or less than 15 ml/min. We have therefore reported how anemia has a multifactorial etiopathogenesis, where the main reasons are represented by the reduction of erythropoietin production by the malfunctioning kidney, by the reduced average life of red blood cells due to the circulating toxins not purified by the kidney, by the limited availability iron for erythropoiesis, inadequate proliferation of red blood cell precursors, decreased exposure of erythropoietin receptors, frequent occurrence of infections due to immunosuppression, iron malabsorption, and red blood cell loss secondary to gastritis chronic, also resulting in folate deficiency, from secondary hyperparathyroidism. It is important to correct the anemia, as the lack of circulating hemoglobin is associated with disabling symptoms, especially asthenia, with a considerable negative impact on the patient's quality of life due to the limitation of social life activities.

All these symptoms are the epiphenomenon of severe pathophysiological presuppositions, such as the dilatation of the left ventricle with a functional insufficiency of the same, therefore an increased prevalence of heart failure, or a deterioration of the function of the heart which does not allow adequate blood perfusion proportional to the needs of the organism. This association of anemia, heart failure, and chronic renal failure is termed cardiorenal-anemia syndrome. Therefore, in patients with end-stage renal disease receiving dialysis, anemia and its clinical consequences are one of the main causes of hospitalization and a factor that increases the risk of mortality. In people undergoing renal replacement

treatment by hemodialysis, correction of anemia prevents and improves both left ventricular dilatation and hypertrophy, thereby reducing hospitalization and mortality rates, with an overall benefit on life expectancy. life and its quality. All treatment guidelines therefore provide for the correction of anemia and that this correction cannot be separated from the regularization of the martial structure. More precisely, in accordance with the KDIGO (Kidney Disease Improving Global Outcomes) guidelines, the following laboratory therapeutic targets are desirable: ferritin level  $> 200$  ng / ml, a transferrin saturation of at least 20%, associated with a normal hemoglobin level, which in relation to some risk factors related to vascular access for hemodialysis treatment, is considered optimal in a range between 10 and 12 g/dl. Recovery of physiological values of hemoglobin and bioavailable iron levels in these patients must be rapid.

Oral administration requires a longer time interval than the rapidity of parenteral infusion, because gastrointestinal absorption, in addition to being slower on the pharmacokinetic level, is hindered by pathological factors, of an inflammatory nature (enteritis, gastritis), often present in patients with terminal renal failure. These conditions limit both gastric iron chelation and its absorption from the enteric mucosa. The availability of commercially available products that allow the therapeutic objectives indicated by the KDIGO guidelines to be achieved quickly and with good tolerability, has considerably improved the treatment of anemia in patients with end-stage chronic renal failure. For many years, only intravenous trivalent iron sucrose was used and, starting from 2015, the use of carboxymaltose iron was introduced, proposed as advantageous in terms of rapid efficacy and tolerability. From these assumptions was born the idea of the study conducted at our hemodialysis center, i.e. to evaluate the clinical and economic benefits of the use of carboxymaltose iron in the correction of anemia in patients with end-stage renal disease undergoing hemodialysis.

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