



IRON DEFICIENCY AND ANEMIA IN HEART FAILURE

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ABSTRACT

Heart failure is an international health problem with its high incidence, prevalence, morbidity and mortality rates. There are many complications that can be seen in patients with heart failure due to pathophysiology, drug side effects, comorbid comorbid diseases and limitations caused by heart failure. Comorbid conditions adversely affect the clinical course, worsen the prognosis, make treatment difficult, and make the clinical picture difficult to control.

One of the most common comorbid conditions in heart failure is iron deficiency and anemia. It is important that healthcare professionals, be attentive to iron deficiency and anemia, and raise awareness among patients and their caregivers. In this article, the importance of iron deficiency and anemia, which are common in heart failure patients, will be discussed.

INTRODUCTION

Heart failure is an international health problem with increasing incidence, prevalence, morbidity and mortality rates (1,2) It is defined as heart failure syndrome in the heart failure guidelines published by the European Society of Cardiology. This syndrome; Typically, symptoms of heart failure such as shortness of breath and / or weakness during rest or exercise, signs of fluid retention such as pulmonary congestion or swelling in the ankles, a serious condition with a structural or functional abnormality of the heart (3). The prevalence of heart failure is reported to be approximately 1-2% in adults in developed countries and 10% in individuals over 70 years of age (4). There are 26 million people who are diagnosed with heart failure in the World (5), in

Turkey the Heart Failure Prevalence of Society of Cardiology (HAPPY) at 2 million 424 persons compared to the work that the diagnosis of heart failure and the next 10 years in the number of 3-4 times will increase is stated (6). Heart failure is the most common cause of hospitalization in patients over the age of 65, resulting in more than one million hospitalizations per year (7). Despite the advances in treatment, heart failure still has low quality of life, high hospitalization rates and poor prognosis (2). Patients have difficulties in performing daily life activities, experience economic and psychosocial problems, and encounter problems in business life and social relations (8). There are many problems that can be seen in patients with heart failure due to physio pathological reasons, drug side effects,

comorbid diseases and limitations caused by heart failure (4). Comorbid conditions adversely affect the clinical course, worsen the prognosis, make treatment difficult, and make the control of the clinical picture difficult (2, 9). One of the most common comorbid conditions in heart failure is iron deficiency and anemia (10). Anemia is present in 5-55% of patients with chronic heart failure, and anemia is an important risk factor for hospitalization and death (11). In the study, it was found that iron deficiency and anemia are common in heart failure with low ejection fraction and preserved ejection fraction (10). It is also stated that iron deficiency and anemia are predictors of poor prognosis in heart failure. The World Health Organization states that approximately 1/3 of its patients with heart failure have anemia (2). Argan et al. (2020) examined iron deficiency in right heart failure and iron deficiency was found in 83.3% of the patients and the patients' iron deficiency the prevalence of anemia was found to be 44%. (12). In the study conducted, the prevalence of anemia in hospitalized acute decompensated heart failure reaches up to 49%. (13). Therefore, for the first time in heart failure guidelines (ESC, 2016), iron deficiency has been included in the guidelines as a treatment goal (14). Unlike the previous guideline, the class of indication is specified for HF patients with iron deficiency. Iron deficient (serum ferritin <100 µg / L, or ferritin 100--299 µg / L and transferrin saturation <20%) of symptomatic HF-REF patients should be considered IV ferric carboxymaltose to reduce symptoms, improve exercise capacity and quality of life (class IIa, level of evidence A) (3). Iron; It plays an important role in hematopoiesis, synthesis and degradation of macromolecules, oxygen storage, transport and metabolism, and oxidative metabolism in cardio-skeletal muscle (15,16). Iron deficiency affects about half of the world population (17). Iron deficiency; low aerobic performance, poor physical condition, decreased cognitive function, dizziness, shortness of breath, restless leg syndrome and hair loss (18). There is a strong relationship between iron deficiency and

anemia with the severity of the picture of heart failure (2,19). A decrease of 1 g / dl in hemoglobin causes a 6% increase in the risk of left ventricular hypertrophy (20). In a study conducted, it was found that hematocrit values lower than 30% in patients aged 65 and over hospitalized in the coronary intensive care unit were associated with increased mortality (21).

Iron deficiency and anemia are different concepts. Anemia; While the hemoglobin level is <13 g / dL in men and below 12 g / dL in women, iron deficiency; It is defined as a ferritin level below 100 µg / L (4, 22, 23). Anemia is not necessary for iron deficiency. In the study conducted by Wong et al. (2016), the prevalence of iron deficiency in heart failure with or without anemia was found to be 61%. In this study, it was found that the rate of iron deficiency alone or with anemia was higher than the rate of anemia (24). In the study of Jankowska et al. (2010), iron deficiency was stated as independent from anemia and as a cause of poor prognosis (25). The mortality rate of patients with iron deficiency increases four times compared to patients without iron deficiency (22). This shows that iron deficiency is a more dangerous comorbid condition than anemia. There are many etiologies of the development of anemia and iron deficiency in patients with heart failure. These; advanced age, diabetes mellitus, chronic renal failure, low exercise capacity, NYHA III-IV, poor quality of life, edema, low blood pressure, high dose diuretic use, low body mass index and high neurohormone, proinflammatory cytokine and C-reactive protein (CRP) levels (26, 27). In addition, malabsorption, malnutrition, decreased iron absorption, occult bleeding from the gastrointestinal system (GIS) are also among the causes of iron deficiency and anemia. Causes such as intestinal edema, anorexia, and cachexia, which occur especially as HF progresses, cause impairment in iron intake with malnutrition (26, 28). According to the study that Örsçelik and Özkan (2018) studied the prevalence of anemia in patients with heart failure in mersin university cardiology clinic; approximately half of HF patients have anemia (29). In the studies

conducted, the prevalence of anemia and iron deficiency in heart failure patients with preserved ejection fraction was found between 45% and 71.2%. It is stated that the prevalence of anemia and iron deficiency in heart failure gradually increases as the age progresses (30-36). Jankowska et al. (2010) found that iron deficiency independent of anemia was associated with increased mortality (25). In the study conducted by Klip et al. (2013), it was found that iron deficiency independent of anemia is common in heart failure in a study in which patients diagnosed with heart failure with low ejection fraction and heart failure with preserved ejection fraction were examined (37). Anemia and increased red cell distribution width (RDW) has been demonstrated to be independently associated with increased risks of hospitalization and all-cause mortality in patients with chronic heart failure (CHF). The mechanisms underlying anemia in CHF are not fully understood and probably multifactorial (38). In conclusion, studies have found that anemia is associated with heart failure, causing worsening of prognosis and increasing hospitalizations. These studies show that anemia increases mortality 1.5--2 times independent of other clinical variables (2). Studies on iron deficiency and anemia have shown that patients with heart failure and iron deficiency improve their prognosis when treated with IV iron preparations (4, 22). In the study conducted, significant improvements were achieved such as an increase in the quality of life of patients using IV iron preparations, an improvement in their psychosocial status, an increase in 6-minute walking distance, an increase in peak oxygen consumption, and a decrease in the hospitalization time of the patients (4, 22). According to the results of the study of Canım and colleagues investigating the effect of intravenous iron therapy on exercise capacity and cardiac functions in patients with chronic heart failure and anemia, the prevalence of anemia is quite high in patients with HF, and it significantly increases the mortality and morbidity rates in these patients. In patients with HF and iron deficiency anemia i.v. Iron sucrose therapy is safe in

increasing hemoglobin, relieving symptoms and increasing exercise capacity (39). Transfusion is recommended when Hb is below 7 g/dl or if Hb is 7-9 g/dl and hemoglobinuria persists (40). Correction of iron deficiency provides a significant improvement in functional capacity, symptoms and quality of life and reduces hospitalizations (2, 8). In studies conducted with erythropoietin and oral iron preparations, the expected clinical benefits could not be achieved and comorbid conditions were observed (2). Indicating significant benefits in clinical outcomes, even if not in mortality, in studies conducted with intravenous iron therapy in heart failure patients with iron deficiency, with or without anemia, made iron deficiency a treatment target in heart failure (2). In addition, Anker et al. (2009) demonstrated that IV iron treatment had a positive effect on prognosis in chronic heart failure as well as in patients with anemia (41). When anemia is treated in patients with heart failure, it has been observed that cardiac functions improve, as well as hospitalization due to heart failure and a decrease in diuretic use (42). Therefore, the European Heart Association Heart Failure Guideline (2016) recommends IV iron preparation for the treatment of iron deficiency in heart failure (4). If anemia is a marker of disease severity, the increased risk associated with anemia may not be prevented with treatment, but if anemia is a mediator, knowing and treating the cause of anemia may contribute to the reduction of mortality and morbidity in heart failure. However, large randomized studies are still needed to show the effects of anemia and specific treatments on these patients (43).

CONCLUSION

In conclusion, iron deficiency treatment is an important criterion in heart failure. In anemic patients with chronic heart failure, iron sucrose therapy alone has been found to be effective and safe in increasing hemoglobin, increasing effort capacity and functional improved capacity and reduced symptoms. Correction of iron deficiency provides a significant increase in functional capacity, symptoms and quality of life, reduces hospitalizations and improves the

psychosocial status of patients. With advances in diagnosis and risk assessment, more effective treatments will be applied to patient groups at an earlier stage. For this reason, it is important for healthcare professionals, to determine the iron deficiency and anemia of patients, to make the necessary referrals, and to raise awareness among patients and caregivers. In conclusion, although there is no definitive treatment protocol for anemia in heart failure today, a diagnostic evaluation should be made for correctable causes of anemia in all patients (eg iron deficiency, blood loss), and then treatment should be applied accordingly.

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