

CASE PRESENTATION

Iron deficiency in chronic heart failure

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Abstract: Iron deficiency, defined as a value of ferritin level under 100 ng/ml or between 100 and 299 ng/ml, when the transferrin saturation is <20%, represents an important comorbidity in heart failure, its prevalence being directly correlated with the increase in the NYHA scale. Despite this fact, it is frequently neglected. Moreover, it has been observed that iron deficit is an important predictor of morbidity and mortality, even in the absence of anemia.

Keywords: iron deficiency, anemia

Rezumat: Deficitul de fier, definit ca o valoare a feritinei <100 ng/ml sau o valoare cuprinsă între 100 și 299 ng/ml, dar cu TSAT <20%, reprezintă o comorbiditate importantă în insuficiența cardiacă, prevalența sa crescând cu creșterea clasei funcționale NYHA. Cu toate acestea este frecvent neglijată. Totodată, s-a observat că deficitul de fier reprezintă un predictor important al morbidității și mortalității, chiar în absența anemiei.

Cuvinte cheie: deficit de fier, anemie

INTRODUCTION

Iron deficiency represents an important comorbidity in heart failure, however it is frequently neglected. It has been proved that iron deficiency is common in one of two patients with chronic heart failure, its prevalence being directly correlated with the increase in the NYHA scale¹⁻³.

Iron deficiency is defined as a value of ferritin level under 100 ng/ml or between 100 and 299 ng/ml, if the transferrin saturation is <20%². Moreover, it has been observed that iron deficit is an important predictor of morbidity and mortality, even in the absence of anemia⁴.

The following algorithm is recommended to diagnose iron deficiency in chronic heart failure^{1,4}.

Therefore, the 2016 Heart Failure ESC Guide recommends to investigate iron parameters in all patients with chronic heart failure and to treat iron deficiency with ferric carboxymaltose regardless of the presence of anemia^{5,6}.

CASE PRESENTATION

We present the case of a 63 years old woman, without any cardiovascular risk factors, diagnosed with dilated

cardiomyopathy and severe systolic dysfunction of left ventricle (LVEF=15%), who came to the hospital for symptoms of congestive heart failure (minimal effort dyspnea, large amount of ascites fluid and severe peripheral edema).

The patient was diagnosed with dilated cardiomyopathy 6 years ago, when she presented to the hospital for medium effort dyspnea and abnormal, high rate heartbeats.

In order to exclude an ischemic etiology of the dilated cardiomyopathy, the patient underwent a coronary angiography and no lesions of the coronaries were discovered. In addition, in order to evaluate the possibility that the cardiac dysfunction was secondary to viral myocarditis we performed viral markers for hepatitis C, hepatitis B, HIV, CMV, EBV, Toxoplasma and Treponema pallidum, which were all negative.

According to Heart Failure ESC Guide⁵, in order to prevent sudden cardiac death, and because of the fact that on the Holter ECG recording there were observed episodes of non-sustained ventricular tachycardia, a cardioverter-defibrillator implant (I.C.D.) has been performed.

Clinical examination revealed, BP=100/60 mmHg, HR=70/min, rhythmic cardiac sounds, systolic murmur

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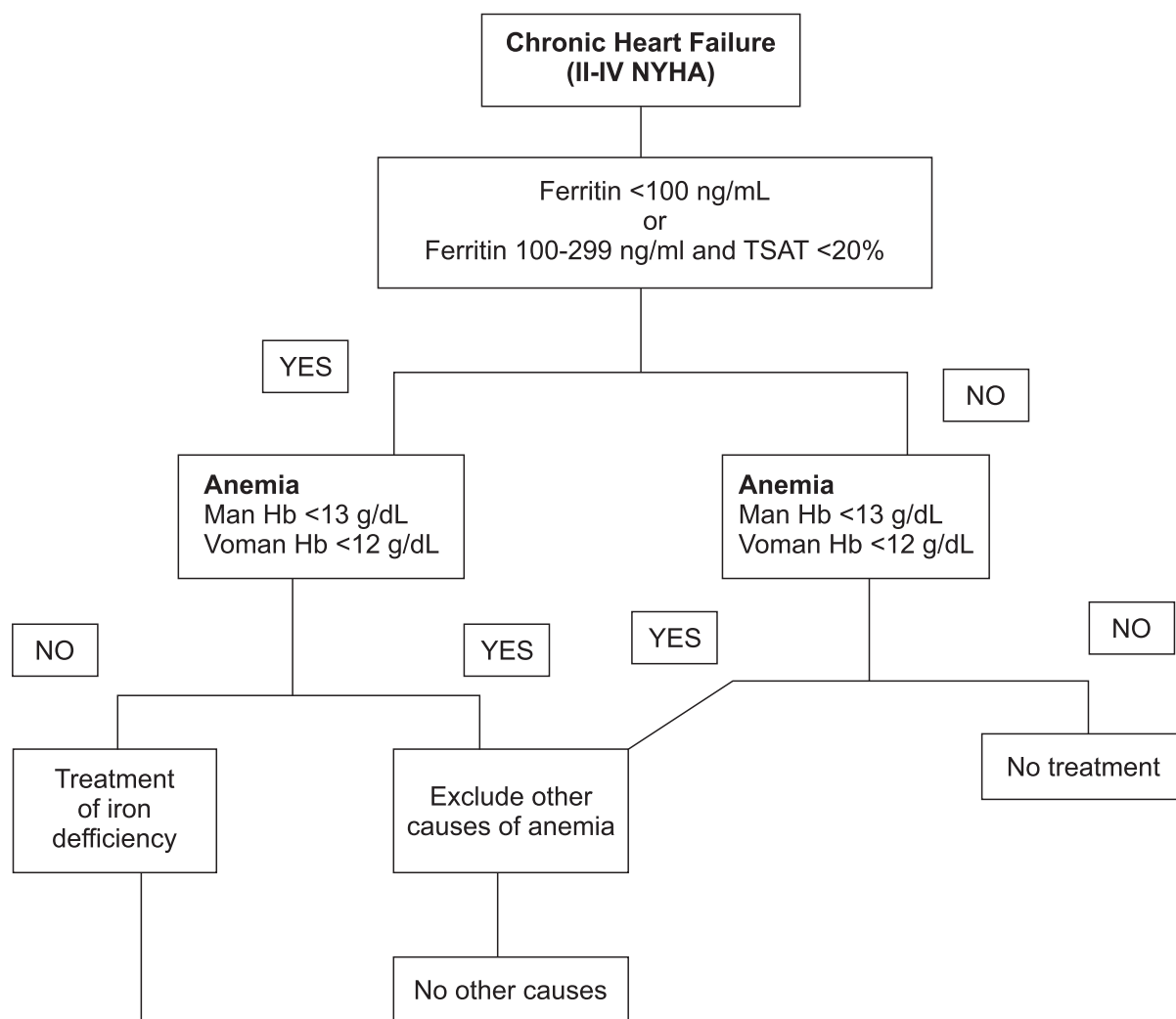


Figure 1. Relationship between cardiovascular complications and depression.

(IV/IV) in the mitral and tricuspid positions, bibasilar crackles, firm and painful hepatomegaly, turgescient jugular veins, large amount of ascites fluid and severe peripheral edema.

On the electrocardiogram, we observe sinus rhythm and first-degree atrioventricular block.

Blood tests reveal increased BNP (1940.7 pg/ml), moderate kidney dysfunction, cholestasis syndrom (total bilirubin=3,06 mg/dl, direct bilirubin=1.73 mg/dl, GGT=205 u/l), iron deficiency (total iron 41 mg/dl, ferritin 34.5 ng/ml), and no anemia (Hb=13.1 g/dl).

Transthoracic ecocardiography showed the aspect of biventricular dilated cardiomyopathy, with severe systolic dysfunction due to diffuse hypokinesia (LVEF 15%), severe biatrial dilation, severe mitral and tricuspid regurgitation, and moderate secondary pulmonary hypertension (estimated sPAP at 50 mmHg).

DISCUSSIONS

The patient received treatment with high dose loop diuretic, in continuous iv administration, with slow response of the diuresis and slow regression of hidrosalin retention. In addition, in accordance with 2016 ESC Guide of Heart Failure⁵, 1000 mg of ferric carboxymaltose were administered, with very good tolerance.

The dose needed to correct iron deficiency was calculated according the following table^{4,6}.

Table 1. Ferric carboxymaltose dosage

Hb g/dl	Patient's weight		
	<35 kg	35-70 kg	>70 kg
<10	500 mg	1500 mg	2000 mg
10-14	500 mg	1000 mg	1500 mg
>14	500 mg	500 mg	500 mg

On discharge, we can observe an improvement in the patient's symptomatology, at the six minutes walk test, she managed to cover 252 m. Three months later, the clinical evaluation showed an increase in the patient's tolerance to effort, at the six minutes walk test, managing to cover with 150 m more than the previous examination. Additionally, we can observe the correction of the ferritin level and a normal value of the hemoglobin. Subsequently, it is recommended to evaluate iron parameters 1-2 times a year, whether alterations in the symptomatology appear or if the hemoglobin level decreases⁹.

The particular aspects of the case are:

- the presence of dilated cardiomyopathy with severe systolic dysfunction in a woman without cardiovascular risk factors, with a rapid evolution.
- maintaining sinus rhythm despite the severe atrial dilation.
- the improvement of the symptomatology and effort capacity after the correction of the iron deficiency.

CONCLUSION

To sum up, we emphasize the importance of investigating iron parameters in all patients diagnosed with chronic heart failure, regardless of the presence of anemia. Even though this may seem as a minor aspect in the long list of investigations needed for diagnosis, it

has a significant impact on the quality of life of patients suffering from chronic heart failure.

Conflict of interest: none declared.

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