

Heart failure: unfavorable patient prognosis from the coexistence of many diseases

Niewydolność serca – niekorzystne rokowanie u pacjenta
ze współistnieniem wielu chorób

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Abstract

Due to its incidence (approx. 750,000 patients in Poland) and simultaneous short survival time (only approx. 50% of patients survive 4 years after the diagnosis), heart failure (HF) poses a serious problem in contemporary cardiology. The clinical case presented below concerns a HF patient with multiple comorbidities which make prognosis significantly more difficult. Clinical assessment is of key importance with regard to the determination of treatment and the decision to implement palliative care. Despite the administration of optimal pharmacological treatment of HF, the condition of the patient in question deteriorated significantly within two months – to such extent that treatment characteristic of the end-of-life period had to be implemented. Such procedure is supported by the current scientific reports suggesting the implementation of palliative treatment already at earlier stages of HF advancement, particularly in patients with severe comorbidities.

Key words: heart failure, palliative care, left ventricular ejection fraction, prognosis

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Introduction

Heart failure (HF) is a condition consisting in reduced supply of oxygenated blood to body tissues in relation to their metabolic needs. It stems from abnormal function of the myocardium and manifests primarily by reduced tolerance to effort, dyspnea and peripheral edema. Due to its high incidence in the population and short average survival time from the moment of diagnosis (only 50% of patients survive 4 years after the diagnosis), HF poses a serious problem in contemporary cardiology. It is estimated that approximately 750,000 people are suffering from heart failure in Poland [1]. In this article we are presenting a number of diagnostic and treatment-related difficulties encountered by physicians caring for HF patients with multiple comorbidities.

In such case, consideration should be given to prognosis evaluation and making of a possible decision regarding withdrawal of futile medical care and implementation of palliative care [2].

Case study

A 78-year-old patient with obesity, type 2 diabetes, asthma and left His bundle branch block was admitted to the Clinic of Cardiology due to increasing dyspnea and worsening tolerance to physical effort. At admission, the patient was in a serious condition, suffering from resting dyspnea. Auscultatory examination revealed reduced vesicular murmur above the lung fields and rales below scapular angles. Moderate peripheral edemas and bradychardia [heart rate

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(HR) 45/min], blood pressure (BP): 136/58 mm Hg, were present. Laboratory tests revealed significantly elevated N-terminal pro-B-type natriuretic peptide (NT-proBNP) and C-reactive protein (CRP), signs of impaired renal function, macrocytic anaemia, hypernatremia, a number of shifts in protein fraction panel in the course of inflammation and hematuria (detail in Table 1). Electrocardiography (ECG) revealed third degree atrioventricular block with escape ventricular rhythm 40/min. Echocardiographic signs of HF with slightly impaired left ventricular ejection fraction (LVEF) were observed: 48%, no sectional contractility disorders were observed in the left ventricle and no significant valvular defects were found. Chest X-ray revealed inflammatory lesions in lower and central lung fields. Blood, sputum, urine and rectal swab cultures were performed. The cultures revealed an increase in *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*. During the hospitalisation the patient was unresponsive. A computed tomography (CT) scan of the head was performed, revealing foci of vascular hypodensity, cortico-subcortical atrophies, without signs of cerebral stroke. Due to the fact that patient's stomach was bloated and painful on palpation, an ultrasound of the abdominal cavity was performed. It revealed hepatomegaly with signs of steatosis, dilated intestinal loops and lack of peristalsis. The diagnostics was extended by a CT angiography of the abdominal cavity that revealed a solid mass within the splenic flexure of the transverse colon of 90 mm in length and signs of obstruction in the small intestine. Gastroscopy revealed a duodenal ulcer covered in fibrin, without active bleeding. Colonoscopy did not reveal the described mass in the transverse colon.

Salbutamol was administered intravenously in order to accelerate the HR. The effect was good. Pneumonia was treated with levofloxacin administered in a standard dose. Berodual, budesonide and teophylline were administered to achieve bronchodilation. Due to progressing circulatory failure and increasing peripheral oedemas, diuretic treatment was intensified. Symptoms of respiratory and renal failure were increasing despite the administered treatment, the patient was still unresponsive. Decision was made to intubate and ventilate the patient; he was temporarily secured with an endocavitary electrode and then transferred to the Intensive Care Unit (ICU).

After 2 months of intensive, multidirectional treatment, the patient was again transferred to the Cardiology Clinic. He was conscious, spontaneously breathing through the tracheostomy tube and receiving passive oxygen therapy with a flow of 5 L/min, BP 136/80 mm Hg, HR 80/min. Percutaneous endoscope gastrostomy (PEG) was performed and the patient was fed with a specialised formula. Auscultatory examination revealed symmetric vesicular murmur, crackles and rhonchi above the lung fields. Laboratory tests revealed persistent leukocytosis, elevated CRP, macrocytic ischemia, normal renal parameters (creatinin: 0.78 mg/dL).

Table 1. Results of additional examinations during the first hospitalisation at the Cardiology Clinic

Laboratory test	Result
NT-proBNP [pg/mL]	3,112
Urea [mg/dL]	76
Creatinine [mg/dL]	2.32
GFR [mL/min]	29
RBC [$\times 10^6/\mu\text{L}$]	3.85
HgB [g/dL]	13.2
MCV [fL]	104.2
Na [mmol/L]	163
WBC [$\times 10^3/\mu\text{L}$]	12.00
Fibrinogen [mg/dL]	460
CRP [mg/L]	296.8
Protein fraction pattern	
Total protein [g/dL]	5.4
Albumins [%]	52.9
Alpha ₁ -globulins [%]	5.2
Alpha ₂ -globulins [%]	16.4
Beta-globulins [%]	14.3
General urinalysis	
Erythrocytes	20–30, isomorphic, dysmorphic
Bilirubin [mg/dL]	1
Colour	Brown
Clarity	Slightly cloudy

NT-proBNP – N-terminal pro-B-type natriuretic peptide; GFR – glomerular filtration rate; RBC – red blood count; HgB – hemoglobin; MCV – mean corpuscular volume; Na – sodium; WBC – white blood count; CRP – C-reactive protein

ECG revealed cardiotropic rhythm without significant slow downs, low percentage of stimulation (details: Figure 1). In echocardiography, the left ventricle showed regional contractility disorders, lowering of LVEF from 48% to 30%. During hospitalization, the condition of the patient remained severe. The patient was occasionally agitated, removed the PEG – the feeding was continued with the use of a nasogastric tube. Decision was made to remove the endocavitary electrode. Pressure ulcers were surgically treated. Laryngologist recommended maintaining the endotracheal tube due to the necessity of further passive oxygen therapy. Given the severe condition of the patient, treatment characteristic of the end of life period had to be considered. The decision was made with the use of the guidelines of the Polish Society of Cardiology (PTK, *Polskie Towarzystwo Kardiologiczne*), according to which the patient met most of the criteria suggesting such treatment (Table 2) [3]. Due to the overall clinical picture, it was decided that the patient would be transferred to a hospice.

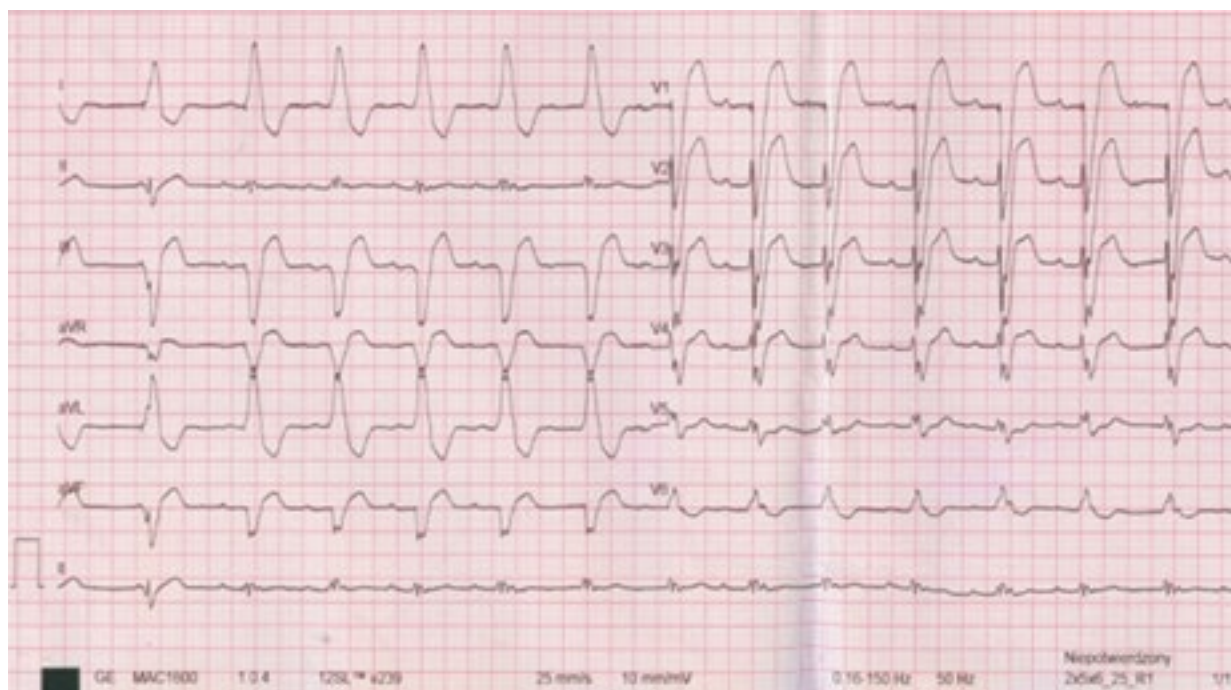


Figure 1. Electrocardiography (ECG) during re-hospitalisation at the Clinic of Cardiology: sinus rhythm frequency 84/min, levogram, left His bundle branch block (LBBB), atrioventricular block of the 1st degree, single stimulations from the pacemaker – effective ventricular stimulation

Table 2. The guidelines of the Polish Society of Cardiology, helpful when assessing patients with heart failure in whom treatment characteristic of the end of life period should be considered. The criteria met by the described patient are on the darker background (source [3])

Progressive decline in capacity (physical and mental) and lack of independence in most everyday activities
Severe symptoms of heart failure accompanied by low quality of life despite the optimised pharmacotherapy and other management methods
Frequent hospitalisations or other serious episodes of decompensation despite optimal treatment
Lack of possibility of heart transplant and mechanical circulatory support
Heart cachexia
Impending end of life in clinical assessment

Discussion

There is a number of literature data describing clinical assessment and prognosis in HF patients, which are also helpful when making the decision regarding the implementation of palliative treatment. The LVEF value constitutes a standard criterion in clinical assessment in HF; in the case of patients with LVEF < 45% prognosis is poor and palliative treatment should be considered. According to the reports, some patients with LVEF > 45% also need such treatment [4]. In the described case, due to comorbidities of other systems, the condition of the patient who was initially diagnosed with HF with slightly impaired LVEF, at the level of 48% (a decrease

to 30% within 2 months), significantly deteriorated within several months and the implementation of treatment characteristic of the end of life period was necessary. A study comparing a group of patients (N = 75) treated with the use of traditional pharmacological treatment of HF with a group of patients (N = 75) simultaneously treated with heart failure and palliative treatment, indicates a significant improvement in the comfort of life, reduction in anxiety and the incidence of depression as well as improvement in the mental state of those patients in whom palliative treatment was additionally administered [5]. It confirms the necessity to consider such treatment already at early stages of HF advancement, in particular when numerous comorbidities are present.

Conclusions

Analysing the above case, it can be concluded that comorbidities significantly worsen the prognosis in HF patients and may cause adverse course of the disease, despite initial diagnosis of HF with slightly impaired LVEF. It prompts increased caution and results in a necessity to carefully

monitor the condition of such patients in order not to delay the implementation of palliative treatment, which improves the quality of life of patients.

Conflict of interest

The authors declare no the conflict of interest.

Streszczenie

Niewydolność serca (HF) jest poważnym problemem współczesnej kardiologii ze względu na częstość występowania (w Polsce ok. 750 tys.) przy jednoczesnym krótkim czasie przeżycia (tylko ok. 50% pacjentów przeżywa 4 lata od rozpoznania). Przedstawiony przypadek kliniczny dotyczy pacjenta z HF obciążonego wieloma chorobami współistniejącymi, które znacząco utrudniają określenie rokowania. Ocena kliniczna jest kluczowa w ustaleniu właściwego postępowania i podjęciu ewentualnej decyzji o wdrożeniu leczenia paliatywnego. W opisywanym przypadku mimo optymalnej farmakoterapii HF stan pacjenta w ciągu 2 miesięcy znacząco się pogorszył – do tego stopnia, że trzeba było wdrożyć leczenie charakterystyczne dla schyłkowego okresu życia. Takie postępowanie znajduje potwierdzenie w aktualnych doniesieniach naukowych sugerujących stosowanie leczenia paliatywnego już na wcześniejszych etapach zaawansowania HF, a w szczególności gdy współistnieją ciężkie choroby towarzyszące.

Słowa kluczowe: niewydolność serca, leczenie paliatywne, frakcja wyrzutowa lewej komory, rokowanie

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