



Srčano zatajivanje s održanom sistoličkom funkcijom — novi entitet u kardiologiji

Heart failure with preserved ejection fraction — a new entity in cardiology

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SAŽETAK: S većom prevalencijom osoba starije životne dobi u razvijenim zemljama, a napose primjenom suvremene ehokardiografske dijagnostike, šire se dometi spoznaje temeljnih mehanizma nastanka zatajivanja srca temeljenog na dijasstoličkoj disfunkciji i stvara potreba za definiranjem entiteta srčanog zatajivanja s održanom sistoličkom funkcijom (Heart Failure with preserved Ejection Fraction; HFpEF). Nejasne karakteristike bolesnika i liječenje bez dokaza učinkovitosti marginaliziraju poznati entitet od 1998. godine. Jednako ozbiljna prognoza kao srčano zatajivanje s reduciranom sistoličkom funkcijom (Heart Failure with reduced Ejection Fraction; HFrEF), nakon hospitalizacije i rast udjela u ukupnom broju zatajivanja srca repositioniraju HFpEF u središte pozornosti. Evaluacija dijasstoličke funkcije mora se istaknuti u svakom nalazu ehokardiografskog pregleda. Preliminarni rezultati studije Aldo-DHF pojašnjavaju kliničke karakteristike oboljelih od HFpEF. Ulogu humoralne aktivacije u remodeliranju miokarda i terapijske implikacije nemedikamentnih intervencija osobito treninga unose nove obećavajuće elemente u sveobuhvatnu terapiju.

KLJUČNE RIJEČI: ehokardografija, srčano zatajivanje, dijasstolička funkcija.

SUMMARY: With ever greater prevalence of elderly persons in the developed countries, especially by applying modern echocardiographic diagnostics, the knowledge of fundamental mechanisms of occurrence of heart failure based on diastolic dysfunction is disseminated and the need for defining the heart failure entities with preserved ejection fraction (HFpEF) is created. Unclear characteristics of patients and treatment with no evidence of efficiency have marginalized the known entity since 1998. The equally serious prognosis such as heart failure with reduced ejection fraction (HFrEF) following the hospitalization and the growth in the portion in the total number of heart failure repositions HFrEF into the center of attention. The evaluation of the diastolic function must be emphasized in every finding of the echocardiographic examination. The preliminary results of the study Aldo-DHF explain clinical characteristics of the persons suffering from HFpEF. The role of humoral activation in remodeling of myocardium and therapeutic implication of nonpharmacological interventions, especially of the training bring the new promising elements in the more comprehensive therapy.

KEYWORDS: echocardiography, heart failure, diastolic function.

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Razvojem medicine i primjenom suvremenih metoda konzervativnog, invazivnog i kirurškog liječenja, mijenja se kazuistika bolesti. Nove slikovne dijagnostičke metode, osobito široka primjena ultrazvuka i doplera u dijagnostici srčanih bolesti u praksi diferenciraju dosad poznate bolesti u subgrupe.

Godine 1998. Europska radna grupa za dijasstoličko zatajivanje srca objavljuje skup kriterija za dijagnosticiranje dijasstoličkog zatajivanja srca (diastolic heart failure; DHF). U početku se smatralo da je u podlozi jedne trećine svih zatajivanja DHF, no primjenom ujednačenih dijagnostičkih kriterija, DHF se nalazi u više od polovice srčanih zatajivanja¹.

Prema kriterijima ESC za postavljanje dijagnoze dijasstoličkog zatajivanja srca (Heart Failure with preserved Ejection Fraction; HFpEF) potrebno je sljedeće: 1. klinička slika zatajivanja srca NYHA II. stupnja i više; 2. održana ejection fraction LVEF >50%; 3. dokaz postojanja poremećaja popuštanja ili pojačana krutost lijeve kljetke. Zbog subjektivnosti procjene za dijagnozu je neophodno postojanje simptoma i nalaza zatajivanja uz spiroergometriju ili 6-minutni test hodanja. Potpunu sinopsu ehokardiografskih pokazatelja dijasstoličke disfunkcije čine: obrazac transmi-

The change to development of medicine and application of modern methods of conservative, invasive and surgical treatment leads to a change to casuistics of diseases. The new imaging diagnostic methods, especially the wide application of ultrasound and Doppler in the diagnostics of cardiovascular diseases categorize in practice the diseases known so far into the subgroups.

In 1998, the European Working Group for Diagnostic Heart Failure publicized the group of criteria for diagnosing diastolic heart failure (DHF). At the beginning, it was thought that DHF caused one third of all cases, but the application of uniform diagnostic criteria showed that DHF is a cause of more than one half of all heart failures¹.

According to ESC criteria for making diagnosis of diastolic heart failure (Heart Failure with preserved Ejection Fraction; HFpEF) the below is required: 1. clinical image of heart failure of NYHA class II or more; 2. preserved ejection fraction LVEF >50%; 3. evidence of presence of the failure disorder or greater rigidity of the left ventricle. Due to subjectivity of the evaluation for the diagnosis, the presence of symptoms and signs of failure with spiroergometry or 6-minute walk test is necessary. The complete synopsis of echocardiographic indicators of the diastolic dysfunc-



tralnog utoka, ranodijastolne vršne brzine produljenja mitralnog prstena, profil protoka u pulmonalnim venama, Ard-Ad, volumen lijevog atrija (površina-duljina ili sumacijski slojni — atrijski "Simpson"), IVRT, LVMI. Postojanje fibrilacije atrija smatra se surogatom dijastoličke disfunkcije²⁻⁴.

Prognoza dijastoličke i sistoličke insuficijencije smatraju se jednako ozbiljnom nakon prve hospitalizacije². Prevalencija i ozbiljna prognoza dovoljni su razlozi za pridavanje jednake važnosti dijastoličkoj funkciji u ehokardiografskoj evaluaciji kao i sistoličkoj. Prema preporukama Europskog udruženja za ehokardiografiju o standardizaciji izvedbe i izvješća ehokardiografskih studija, vrijednosti varijabli dijastoličke disfunkcije te definicija stupnja moraju biti zastupljenom u svakom nalazu ehokardiografskog pregleda. Praktički je izvedivo u svakom nalazu navesti transmitralni obrazac, odnos E/A i E/e', u slučaju nalaza visokog tlaka punjenja lijeve klijetke, potrebno je odrediti plućni arterijski tlak tako da se transtrikuspidalnom gradijentu doda tlak desnog atrija, procijenjen prema veličini i respiracijskoj modulaciji donje šuplje vene.

Nejasne kliničke karakteristike i potpuno empirijski terapijski pristup, bez dokazane učinkovitosti primjene lijekova koje koristimo za liječenje sistoličke disfunkcije, podupiru nisku razinu percepcije značenja dijastoličke disfunkcije. DHF se drži konglomeratom čimbenika kardiovaskularnog rizika, s posljedičnim remodeliranjem srca i gubitkom elastičnosti, pojačanim odlaganjem kolagena u intercelularnom matriksu, hipertrofiji kardiomiocita i stanica intercelularnog citoskeleta, pod utjecajem aktiviranog renin-angiotenzin-aldosteronskog sustava. Kardinalni čimbenik rizika je starenje, zatim arterijska hipertenzija, tip 2 dijabetes s hiperinzulinemijom i pretilost, češća kod žena.

Prvi rezultati najveće studije o dijastoličkom srčanom zatajivanju Aldo-HF (Aldosterone receptor blockade in diastolic heart failure), donose više saznanja o kliničkim karakteristikama bolesnika s HFpEF. Ispitanici u studiji bili su stariji, pretili, s hipertenzijom kao najzastupljenijim čimbenikom rizika. Usprkos nedostatku dokaza o prognostičkoj dobrobiti, većina pacijenata je bila liječena beta-blokatorima i ACE inhibitorima/AT 1 antagonistima. Pacijenti s DHF imali su male hipertrofične klijetke sa (supra)normalnom ejekcijskom frakcijom, dilatirani lijevi atrij s relevantnom prevalencijom atrijske fibrilacije, povišenim tlakom punjenja, ali je većina bila klasificirana u I. stupanj dijastoličke disfunkcije. Srednja vrijednost NTproBNP je bila samo blago povišena. Stoga se stupanj dijastoličke disfunkcije pokazao kao slabi prediktor intolerancije opterećenja u DHF⁵.

Visoki tlak punjenja lijeve klijetke i pulmonalni kapilarni tlak >15 mmHg prepoznate su kao indikacija za primjenu inhibitora fosfodiesteraze, s dobrim rezultatima poboljšanja kardiorespiratornih varijabli.

Studije o pozitivnom učinku strukturiranog treninga na manjem broju pacijenata pokazale su pozitivni utjecaj na kvalitetu života, ali bez dokaza o utjecaju na dijastoličku disfunkciju.

Među nefarmakološke metode liječenja ubrajamo i primjenu stimulatora barorefleksa karotidne arterije koji su pokazali obećavajuće rezultate⁶.

Dosljednom primjenom spomenutih varijabli u izvješćima ehokardiografskih studija mogao bi se dobiti uvid u

tion includes: transmitral inflow pattern, early diastolic peak velocity of the prolongation of the mitral ring, flow profile in the pulmonary veins, Ard-Ad, left atrial volume (surface-length or summable layer — atrial "Simpson"), IVRT, LVMI. Presence of atrial fibrillation is considered to be the surrogate of the diastolic dysfunction²⁻⁴.

The prognosis of diastolic and systolic insufficiency is considered to be equally serious after the first hospitalization². The prevalence and serious prognosis are sufficient reasons for attaching the same importance to the diastolic function in the echocardiographic and systolic evaluation as well. According to the recommendations of the European Association of Echocardiography of standardization of performance and report of the echocardiographic studies, the values of the variables of the diastolic dysfunction and the definition of the class have to be represented in every result of the echocardiography examination. It is practically feasible to name the transmitral pattern in every result, the relation between E/A and E/e', in the case of high left ventricular filling pressure it is necessary to determine the pulmonary artery pressure, so that the right atrial pressure should be added to the transtricuspid gradient, evaluated according to the size and respiratory modulation of the inferior vena cava.

Unclear clinical characteristics and a full empiric therapeutic approach with no proved drug efficiency that we use for the treatment of systolic dysfunction, support a low level of perception of the importance of diastolic dysfunction. DHF is considered to be the conglomerate of cardiovascular risks factors with consequential remodeling of heart and loss of elasticity by stronger disposal of collagen in the intercellular matrix, hypertrophy of cardiomyocytes and cells of intercellular cytoskeleton influenced by activated renin-angiotensin-aldosterone system. The essential risk factor is aging, hypertension, type 2 diabetes with hyperinsulinemia and obesity, more often in women.

The first results of the largest study of diastolic heart failure Aldo-HF (Aldosterone receptor blockade in diastolic heart failure), bring some more information on clinical characteristics of patients with HFpEF. The patients in the study were older, obese with hypertension as the most represented risk factor. In spite of the lack of evidence on prognostic benefit, the majority of patients were treated by beta-blockers and ACE inhibitors/AT 1 antagonists. Patients with DHF had small hypertrophic ventricles with (supra)normal ejection fraction, dilated left atrium with relevant prevalence of atrial fibrillation, increased filling pressure, but the most of them were classified as diastolic dysfunction class I. The mean value of NTproBNP was only slightly increased. Therefore, the class of diastolic dysfunction was shown as a poor predictor of intolerance of load in DHF⁵.

Increased left ventricular filling pressure and pulmonary capillary pressure >15 mmHg were recognized as an indication for applying phosphodiesterase inhibitor with good results of improvement of cardiorespiratory variables.

The studies on positive effect of the structured training on a smaller number of patients have shown positive impact on the life quality, but without any evidence of impact on diastolic dysfunction.



učestalost HFpEF u hrvatskoj kazuistici, unaprijediti spoznaje i omogućiti vlastita iskustva u tijeku bolesti i terapiji.

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Amongst non-pharmacological treatment methods we include the application of baroreflex carotid stimulator artery that showed promising results⁶.

By consistent application of the above mentioned variables in the echocardiography reports we could get an insight into the frequency of HFpEF in the Croatian casuistics, improve knowledge about it and acquire our own experience in the course of the disease and therapy.

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