International Cardiovascular Forum Journal 10 (2017)
DOI: 10.17987/icfj.v10i0.451

The Management of Co-Morbidities in Patients with Heart Failure – Angina and Coronary Disease

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Abstract

Co-morbidities are particularly relevant in the management of HF as they may confound HF diagnosis, worsen symptomatology, impact quality of life and aggravate the prognosis. According to the most recent European Society of Cardiology (ESC) guidelines, treatment of co- morbidities is an essential element of the comprehensive care of HF. Angina and coronary artery disease (CAD), in particular are common disorders associated with HF. The pharmacological and surgical management of angina according to the ESC guidelines is reviewed in this article.

Keywords: Coronary artery disease; Heart failure; Angina; Guidelines

Citation: Spoletini I and Seferovic P. The Management of Co- Morbidities in Patients with Heart Failure – Angina and Coronary Disease. International Cardiovascular Forum Journal. 2017;10:65-67. http://dx.doi.org/10.17987/icfj.v10i0.451

Introduction

Co-morbidities are particularly relevant in the management of HF as they may confound HF diagnosis, worsen symptomatology, impact quality of life and aggravate the prognosis.[1,2] According to the most recent European Society of Cardiology (ESC) guidelines[1], treatment of co-morbidities is an essential element of the comprehensive care of HF. Angina and coronary artery disease (CAD), in particular are common disorders associated with HF.[3] The pharmacological management of angina according to the ESC guidelines is shown in Figure 1 and specific recommendations are listed in Tables 1 and 2.

Pharmacological treatment

The recommended first-line therapeutic agent for angina control is a beta blocker, due to its efficacy in reducing the risk of HF hospitalisation and the risk of death.[4–7] In appropriately selected HF patients with reduced ejection fraction (HFrEF) angina relief may be obtained with ivabradine as demonstrated by the Systolic Heart failure treatment with the I(f) inhibitor ivabradine Trial (SHIFT).[8] Beta-blockers and ivabradine may also be used to relieve angina symptoms in HF patients with preserved ejection fraction (HFpEF) but further studies are needed.[1]

The addition of trimetazidine to beta-blockers has been also found to improve New York Heart Association functional class, exercise duration and left ventricular function[9–15] and therefore according to the guidelines[1] trimetazidine may be beneficial and safe in patients with HFrEF for added angina control.

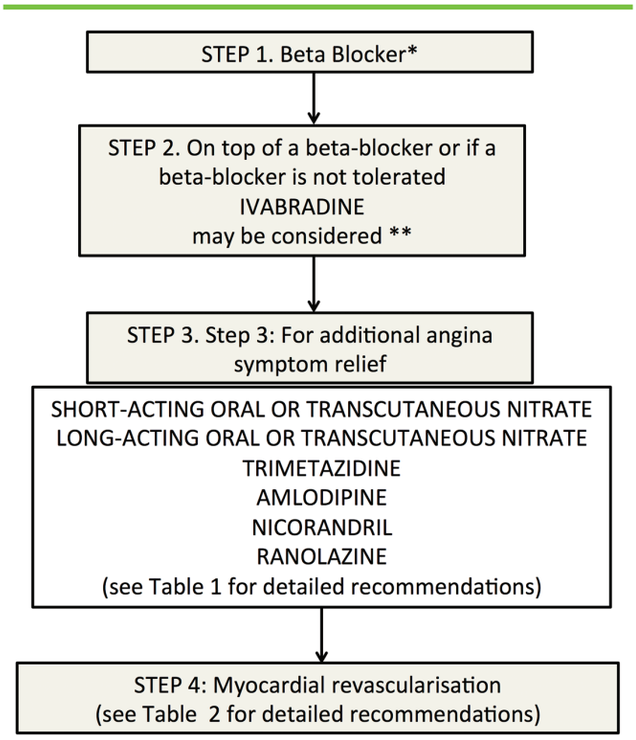

Figure 1. Treatment of stable angina pectoris patients with symptomatic HFrEF according to 2016 ESC guidelines[1]

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ISSN: 2410-2636

International Cardiovascular Forum Journal 10 (2017)
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Table 1. ESC recommendations for additional angina symptom relief* in patients with symptomatic HFrEF

Recommendation	Class
A short-acting oral or transcutaneous nitrate should be considered (effective anti-anginal treatment, safe in HF).	IIa
A long acting oral or transcutaneous nitrate should be considered (effective anti-anginal treatment, not extensively studied in HF).	IIa
Trimetazidine may be considered when angina persists despite treatment with a beta-blocker (or alternative) to relieve angina (effective anti-anginal treatment, safe in HF).	IIb
Amlodipine may be considered in patients unable to tolerate a beta-blocker to relieve angina (effective anti-anginal treatment, safe in HF).	IIb
Nicorandil may be considered in patients unable to tolerate a beta-blocker to relieve angina (effective anti-anginal treatment, but safety in HF uncertain).	IIb
Ranolazine may be considered in patients unable to tolerate a beta-blocker to relieve angina (effective anti-anginal treatment, but safety in HF uncertain).	IIb

* except from any combination not recommended
HF = heart failure; HFrEF = Heart failure with reduced ejection fraction.
Class of recommendation: I = evidence and/or general agreement that a given treatment or procedure is beneficial, useful, effective; II = conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the given treatment or procedure (IIa: weight of evidence/opinion is in favor of usefulness/efficacy; IIb: usefulness/efficacy is less well established by evidence/opinion); III: evidence or general agreement that the given treatment or procedure is not useful/effective, and in some cases may be harmful.

Table 2. ESC recommendations for myocardial revascularisation in patients with stable angina and symptomatic HFrEF

Recommendation	Class
Myocardial revascularization is recommended when angina persists despite treatment with anti-anginal drugs.	I
Alternatives to myocardial revascularization: combination of > 3 anti-anginal drugs (from those listed above) may be considered when angina persists despite treatment with a beta-blocker, ivabradine and an extra anti-anginal drug (excluding the combinations not recommended below).	IIb
The following are NOT recommended: 1. Combination of any of ivabradine, ranolazine, and nicorandil because of unknown safety 2. Combination of nicorandil and a nitrate (because of lack of additional efficacy)	III
Diltiazem and verapamil are not recommended because of their negative inotropic action and risk of worsening HF.	III

Class of recommendation: I = evidence and/or general agreement that a given treatment or procedure is beneficial, useful, effective; II = conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the given treatment or procedure (IIa: weight of evidence/opinion is in favor of usefulness/efficacy; IIb: usefulness/efficacy is less well established by evidence/opinion); III: evidence or general agreement that the given treatment or procedure is not useful/effective, and in some cases may be harmful.

Anti-anginal drugs such as amlodipine.[15] nicorandil[16] and nitrates[17,18] have all been found to be safe and efficacious symptom-wise in HFrEF patients with angina. On the contrary, there is evidence that diltiazem and verapamil are unsafe in HFrEF, although they may be used in HFpEF patients.[19] Finally, the safety of ranolazine and dihydropyridine CCBs (except amlodipine[15] and felodipine[20]) remains to be clarified.

Percutaneous and surgical revascularisation

Relief of angina symptoms in HFpEF may be obtained by myocardial revascularisation.[1] Unfortunately, it still remains to be clarified whether revascularisation procedures would also improve the prognosis. According to the ESC guidelines on myocardial revascularisation[21] and to the ESC guidelines on stable CAD [22],coronary artery bypass grafting (CABG) is recommended to improve prognosis for patients with significant left main stenosis and/or proximal stenosis of both left anterior descending and left circumflex arteries (left main equivalent). However, further studies are needed to substantiate and extend this recommendation to patient with an established diagnosis of HF who formed a very small part of these mainly historical studies upon which this recommendation has been based. The Surgical Treatment for Ischemic Heart Failure (STICH) trial[23] demonstrated the efficacy and safety of CABG in patients with HFrEF and significant CAD (left anterior descending artery or multivessel disease) to reduce death and hospitalisation for cardiovascular causes. In particular, those with >10% of dysfunctional but viable LV myocardium were more likely to benefit from myocardial revascularisation (and those with ≤ 10% less likely to benefit), although further studies are needed to support these conclusions.[1]

According to the 2016 ESC/HFA guidelines, the clinician should make the decision between CABG and percutaneous coronary intervention (PCI) after the careful assessment of patient's clinical status including the prevalent coronary anatomy and site of stenoses, the expected completeness of revascularisation, and any coexisting valvular disease or other co-morbidities.

Declaration of Interest

The author declares no conflicts of interest.

Acknowledgements

The authors have abided by requirements for ethical publishing in biomedical journals [24].

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