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► **To cite this version:**

Nicolas Girerd. The growing importance of heart failure in myocardial infarction. International Journal of Cardiology, 2022, pp.S0167-5273(22)00194-2. 10.1016/j.ijcard.2022.01.068 . hal-03582386

**HAL Id: hal-03582386**

**<https://hal.univ-lorraine.fr/hal-03582386>**

Submitted on 21 Feb 2022

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## **The growing importance of heart failure in myocardial infarction**

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Myocardial infarction (MI) is one of the main initiators of heart failure (HF) (1). The advances made over the last 20 years in MI management, mainly through the advent of percutaneous coronary interventions, has led to a substantial decrease in cardiovascular mortality in the 1990's and the first decade of this century. However, this has also led to an increasing number of patients surviving their MI but developing HF. Whether the favorable trend observed in MI in the 90's would continue in the absence of the major therapeutic breakthroughs in coronary management in the last 10 years is scantily documented. In addition, the impact of HF on outcome following MI has not been sufficiently documented in large registries.

In this month's issue of the *IJC*, De Luca and colleagues (2) report data from a national (Italian) cohort collected between 2009 and 2018. This cohort allowed the assessment of post-discharge mortality at 1 year in more than one million patients. From an HF perspective, the first striking result is that MI was complicated by HF during the index hospitalization in over 20% (21.8%) of patients. This fact alone deserves further consideration. This clearly shows that our management of MI has improved to such an extent that patients with substantial myocardial damage survive their MI at the cost of HF.

The second major result stemming from the study by De Luca and colleagues is the association of HF with mortality following MI. Patients with initial HF experienced an approximately twofold higher 1-year mortality than patients without HF. These findings are in line with previous reports (e.g. HF following PCI has been reported to be associated with an 8-fold higher long-term mortality) (3). This 1-year mortality improved during the course of the study in the entire group (with or without HF), notably from 12.6% to 9.7% in patients aged <75 years and from 15.4% to 11.6%, in males and females respectively, with this improvement being more pronounced in patients with HF than in patients without HF. Yet, despite this improvement, mortality remained at approximately 10% at 1 year in patients under 75 and greater than 30% at 1 year in patients 75 years or older, which is strikingly higher than the 1-year mortality observed in non-HF patients (approximately 4% in patients under 75 and <20 % in patients 75 years or older). The absolute difference in 1-year mortality is consequently considerable, approximately 6% in patients under 75 and 10% in patients 75 years or older.

Given the frequency of this condition (20% of patients with MI) and its association with mid-term mortality (approximately twofold higher mortality at 1 year), we need to adjust our clinical

management to ensure that HF patients receive proper care following MI. Patients managed for an MI complicated by HF should undergo a personalized management during the in-hospital period as well as after discharge to ensure the implementation of HF drugs, HF education, adequate follow-up and management of worsening HF. While we cannot assess whether such integrated/personalized care actually exists currently, it is very likely that such management is relatively inexistent given the low coverage of HF disease management programs in Europe (e.g. based on the Heart Failure Association Atlas of the ESC (4)).

The 2021 HF guidelines of the ESC (1) have emphasized the need for a systematic implementation of disease management programs following hospitalizations for worsening HF. These guidelines also insist that HF medication should be implemented during hospital stay. In light of the striking epidemiological data reported by De Luca and colleagues, we could suggest that this recommendation may/should be extended to patients admitted for MI complicated with HF. Indeed, it is very likely that the in-hospital and post-discharge management of patients admitted for MI despite being complicated by HF is mostly MI-driven, focused on antithrombotic management, treatment of initial ischemia and screening for recurring ischemia during follow-up. Adding a specific HF dimension to this management would probably ensure and hasten HF drug optimization as well as better manage congestion, which could improve mid-term outcome. Importantly, an improvement in HF mortality has been observed in the US during the period 2002-2016 following the implementation of integrated care and promotion of HF drug optimization (5). The in-hospital management of these patients could benefit from the involvement of mobile HF-units and/or a dedicated in-hospital HF consultation with a trained HF physician (or HF nurse). Following discharge, this HF management axis could be subsequently covered by an HF disease management program, operating through eHealth or more conventional HF clinics. In all circumstances, the role of HF nurses is crucial. In addition, pharmacists can greatly contribute to HF management improvement, especially in resource-limited settings (6). These healthcare providers can help reduce/curtail patient non-adherence, which is frequent in the setting of polypharmacy and is associated with increased mortality (7).

The strategy proposed above would appear as a paradigm shift in most centers. Nevertheless, the notion that the outcome of MI with HF is primarily driven by HF should facilitate the acceptance of this shift. In addition, HF treatment has recently evolved into a 4-pillar strategy combining ACEi/ARNi, beta-blockers, mineralocorticoid receptor antagonists and lately SGLT2i (1). This 4-pillar strategy is a new opportunity for which patients and our healthcare system should make every effort to promote its implementation. Investing in the MI with HF healthcare pathway is probably a valuable option to better intervene at early stages of ischemic HF, before the patient enters the vicious cycle of (repeated) worsening HF hospitalizations.

While the strategy detailed above is certainly appealing, evidence is key to change in medicine. The effects of the implementation of such paradigm shift and the involvement of HF care organization in the management of these patients admitted for MI should be assessed in dedicated

studies, ideally RCTs. In the field of HF, it is the wealth of (usually small- to moderately-sized) trials that now allow the recommendation of HF disease management programs within HF guidelines. Let us hope that in the years to come, we will be able to ascertain that this synergy between MI and HF management is the cornerstone to achieving optimized patient care.

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