A history of coronary artery disease has long been considered as a predictor of a higher postoperative risk after noncardiac surgery. Most of the strategies to reduce the risk have been focused on this clinical condition.1-3

Much less evidence is available on the predictors of noncardiac postoperative risk related to a diagnosis of heart failure for at least 2 reasons: (a) the weak definition of documented heart failure common in most studies, and (b) the relatively low number of events on which the evidence is based. Atrial fibrillation has been considered even less, and very scarce information is available on the role of this frequent arrhythmia in predicting the postoperative risk of noncardiac surgery.

This lack of evidence is particularly relevant because both clinical conditions—heart failure4-8 and atrial fibrillation, even more so,9-12—are increasing in prevalence, determining a relevant burden on healthcare systems. Specifically, with increasing age and the improvement of treatments of acute coronary syndromes, heart failure is the most frequent cause of hospitalization in both the United States and Europe today. Although atrial fibrillation is less severe in terms of mortality and morbidity than heart failure, it is now the arrhythmia most frequently seen in clinical practice and is not without adverse consequences.

The article by van Diepen et al13 has the merit of focusing attention on the impact that these 2 relevant clinical conditions can have in terms of short-term mortality after major and minor noncardiac interventions. For this purpose, the authors used administrative databases from Alberta, Canada, that included hospital discharge, survival, and ambulatory care information.

The authors showed that patients with both nonischemic and ischemic heart failure or those with atrial fibrillation had worse postoperative 30-day mortality than patients with coronary artery disease, but without these conditions. More specifically, patients with heart failure had a worse outcome even after a minor surgical intervention such as colonoscopy, cataract, or cystoscopy. Furthermore, the risk was particularly high in patients undergoing a surgical procedure in the 4 weeks that follow an index admission for heart failure or atrial fibrillation. This observation could be the basis for suggesting a longer period of stabilization after an admission, specifically in patients with heart failure, before planning an even minor elective noncardiac intervention.

Strengths and Limitations of the Clinical Message

If the efforts of today's clinicians are focused mainly to reduce the postoperative risk in patients with documented coronary artery disease, the information derived from this study highlights the need to explore new strategies to reduce the risk even in patients with heart failure or atrial fibrillation. This is surely new and important information that this study adds to our knowledge. However, there are 2 major limitations. The first one is related to the definitions of the index clinical conditions. With respect to heart failure, the classification in ischemic/nonischemic is too vague. It is possible that many of the patients with a nonischemic pathogenesis have coronary artery disease even in the absence of a prior admission for an acute coronary syndrome or a revascularization procedure. Furthermore, no information is available regarding the level of the left ventricular ejection fraction of these patients. It can be anticipated that approximately half of the patients admitted for heart failure had preserved left ventricular function,14 and the impact on the outcome of this condition is generally less relevant than that determined by the presence of a clear reduction of left systolic ventricular function.15 These limitations preclude the possibility to generalize the message to all patients with a clinical diagnosis of heart failure.

As far as atrial fibrillation is concerned, the definition is based on having had a prior admission with a primary diagnosis of atrial fibrillation. It is known that, in clinical practice, the majority of patients with this arrhythmia do not need to be hospitalized to manage their clinical condition. Only the subset of hospitalized patients was considered, and the generalization of the message to all patients with atrial fibrillation is not appropriate.

The second major limitation is the applicability in clinical practice of the messages of this article. In this context, the causes of death have been not appropriately defined and validated; therefore, it is very difficult to plan strategies that could be useful in the postoperative risk reduction. This aspect is particularly true for patients with atrial fibrillation for whom anticoagulation therapy or heart/rhythm control strategies could be more specifically and appropriately planned, where a better definition of the poor postoperative outcomes would be useful.

Strengths and Limitations of the Used Methodology

The most relevant aspect of the methodology used in this article is the possibility of broadening the whole spectrum of...
cardiovascular conditions to relate to postsurgical outcomes. The limitation of other methods mainly relate to the fact that the findings are generally derived from a single or limited number of center experience. This raises serious concerns about the transferability of their messages to general clinical practice.\(^{16}\) In this case of the link between discharge databases, survival databases, and ambulatory care databases of a Canadian province, an important perspective is given on performance and outcomes that could not be cleaned from any single institution; this is a major strength. These data include small and less visible institutions committed to the care of a relevant proportion of real-life patients. The other strength is the public nature of the data, reinforcing the transparency and focusing attention on the activities of the broad spectrum of institutions.

However, as in all administrative datasets, the type and number of clinical variables are quite limited. Specifically, (a) the information needed to better define the clinical conditions (the cases of heart failure and atrial fibrillation) is insufficient. For example, we cannot distinguish between heart failure with preserved or reduced ejection fraction; the type of atrial fibrillation (paroxysmal, persistent or permanent; symptomatic versus asymptomatic) cannot be defined; and (b) the limited number of clinical variables does not allow a complete adjustment for all possible confounding factors. It is well known that, even with an extensive list of clinical variables and an outstanding risk model, some patients will have unmeasured conditions, which can influence the mortality risk.

**Take-Home Messages**

Despite these limitations, the article by van Diepen et al adds some important relevant information to the existing knowledge. We have to extend our efforts from the usual strategy of reducing the postsurgical risk of patients with documented coronary artery disease to the evaluation and appropriate management of patients with heart failure of both ischemic and nonischemic pathogenesis. For these patients, even noncardiac minor interventions could be associated with an elevated risk of early postoperative mortality, even greater than the risk of having a diagnosis of coronary artery disease. Further studies with a more detailed definition of atrial fibrillation are necessary to develop updated models to predict the risk of noncardiac, minor, and major interventions, which could possibly include this frequent arrhythmia or just some of its clinical presentations.

**Disclosures**

None.

**References**


Should Heart Failure and Atrial Fibrillation be Considered in Determining the Risk of Noncardiac Surgery?
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_Circulation._ 2011;124:276-277
doi: 10.1161/CIRCULATIONAHA.111.040501

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