EDITORIAL

Advantages and Limitations of Killip and Kimball Class A on Admission for Deciding Early Discharge in ST-Segment Elevation Myocardial Infarction. ARGEN-IAM-ST Registry

Ventajas y limitaciones de la clase Killip y Kimball A al ingreso para decidir el alta precoz en el infarto agudo de miocardio con elevación del segmento ST. Registro ARGEN-IAM-ST

JAVIER GUETTA[1,MTSAC]

In this issue of the Argentine Journal of Cardiology, Dr. José Macías et al. take an interesting look at the prognostic value of Killip & Kimball (KK) class A .(1) They argue that this category does not guarantee a hospital stay free of adverse events, mainly for two reasons: first, because despite having a low individual mortality rate, its high prevalence means that its impact on overall mortality is not negligible; and second, because approximately 5% of patients classified as KK A on admission develop heart failure (HF) during hospitalization, and among them, 20% die before discharge.

The KK classification has been a useful tool since its development, providing a simple but valuable resource for prognostic information in patients with ST-segment elevation myocardial infarction (STEMI). Its usefulness is attributed both to its inherent prognostic value and its simplicity, as it is based exclusively on physical examination. (2,3)

The researchers conducted a retrospective analysis of the prospective, observational, and continuous ARGEN-IAM-ST registry, focusing on the in-hospital evolution of patients admitted in KK class A. A total of 7304 patients were included between March 2015 and October 2024, excluding 174 due to lack of data and 90 due to mechanical complications. Median age was 60 years, and 80% were men. KK class A was the most prevalent finding, (77.6%, n=5666 patients), probably attributable to the implementation of better medical treatments and early reperfusion. Classes B, C, and D accounted for 14%, 1.4%, and 7%, respectively. Overall mortality was 7.3%, and mortality among patients with KK A was 2.6%, representing 28% of the registry total mortality.

A total of 311 patients (5.5%) with KK A at admission developed HF during the course of their illness, with a mortality rate of 21%. In contrast, the mortality rate for those who did not develop HF was 1.5% (OR = 17.7; 95% CI: 12.1-24.3; $p < 0.001$). This means that presenting with KK class A and not developing HF during hospitalization has a high negative predictive value (98.5%) for in-hospital mortality.

The independent variables associated with the development of HF were: age >70 years, female sex, diabetes, left anterior descending artery involvement, longer time from onset of pain to consultation, and failed primary percutaneous coronary intervention (PCI). The model showed moderate discriminatory power (C statistic 0.68). (1)

Despite its simplicity and clinical usefulness, the KK classification has limitations, such as subjectivity in the auscultation of crackles or a third heart sound (S3), which depends on the skill of the examiner and may overlap with other concomitant conditions, such as pneumonia, chronic obstructive pulmonary disease (COPD), or acute respiratory distress syndrome (ARDS). (4) Therefore, physical examination should be considered a complementary method. At this point, there is emerging evidence on the contribution of artificial intelligence to improve our semiological skills. (5)

On the other hand, several authors have supplemented the KK classification with natriuretic peptide testing or lung ultrasound. A new scale that combined the latter with KK class, called the LUCK classification, showed that the absence of pulmonary congestion detected by ultrasound conferred a negative predictive value for in-hospital mortality of 98.1% (95%

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Correspondence: Emiliano Salmeri. E-mail: emilianosalmeri@yahoo.com.ar

[1] Centro de Educación Médica e Investigaciones Clínicas Norberto Quirno (CEMIC), Autonomous City of Buenos Aires, Argentina

CI 93.1-99.5%). The area under the ROC curve of the LUCK classification for in-hospital mortality was 0.89 ($p = 0.001$), compared with 0.86 ($p < 0.001$) for the traditional KK classification. The LUCK classification reclassified patients in 18% of cases. (5) Other studies using lung ultrasound also found that most reclassification was at the expense of patients KK A and B, reflecting the difficulty in correctly detecting mild forms of HF. (6–9)

Beyond these considerations, the value of this analysis, that was carried out in the most representative registry in our field with a cohort of more than 7000 patients, lies in the practicality of its implementation.

Another noteworthy aspect is that it provides a different perspective, focusing the analysis on HF as an evolving event in patients who were classified as KK A. Years ago, in the early 1990s, Carlos Bertolasi's group at Argerich Hospital proposed the use of the Peel and KK indices both in the first hours of evolution and at the time of discharge, calling them "admission" and "discharge" or "stay," respectively. With regard to the latter, the experience of the Coronary Care Unit at Argerich Hospital in 580 patients showed an excellent correlation between stratification at discharge and mortality one year after the infarction, establishing the concept that risk stratification is a continuous process throughout the patient's evolution. (10)

In conclusion, the present study by Macías et al., based on the robust ARGEN-IAM-ST registry, provides an invaluable contribution to the contemporary management of STEMI. Their analysis reinforces a fundamental principle: risk stratification is a dynamic process and does not depend on a single condition at admission. By demonstrating that a subgroup of patients in class KK A, identifiable by simple clinical predictors, has a significant risk of developing HF and mortality, the study challenges complacency and advocates for intensive and prolonged monitoring even in patients who appear to be at lower risk. This finding does not invalidate the usefulness of the KK classification, but rather contextualizes and enriches it. Thus, this study transcends the academic realm to offer practical and crucial guidance for optimizing the safety of early discharge, improving clinical outcomes in our population.

Conflicts of interest

None declared

(See authors conflicts of interest forms on the website).

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