

## A Simple Clinical Risk Score to Predict Post-Discharge Mortality in Chinese Patients Hospitalized with Heart Failure

Guillermo Alberto Arana Morales,<sup>1</sup> Hugo Alpaca-Salvador,<sup>1</sup> Ricardo Salazar-Ramírez<sup>1</sup>

Universidade Nacional de Santa, Chimbote - Peru

We have read with great interest the article published by Wang et al.<sup>1</sup> on the clinical risk score to predict mortality in Chinese patients hospitalized for heart failure (HF). The authors developed a scale with five variables to predict mortality from HF after hospital discharge within one year: age, female sex, New York Heart Association (NYHA) score >3, left atrial diameter, and body mass index; with good predictive ability.<sup>1</sup> One limitation of the study is the design of random division into two groups, one for the development of the predictive model and the other to evaluate its performance, which, when drawn from the same cohort, have similar characteristics and therefore the predictive performance may be overestimated.<sup>2</sup>

A very interesting aspect of the study is that it focuses on the evaluation of patients with HF at hospital discharge, uses simple, easily assessable predictive variables, and predicts mortality at one year. There are a variety of studies of prognostic scores for HF, in outpatient, hospitalized, or emergency patients, and they predict mortality during hospitalization, within the first 30 days, or a year; many of them with biases that limit their validity.

A systematic review evaluated prognostic models in patients with acute HF in the emergency room. Eight studies were identified. The most frequently estimated predictive outcome was 30-day mortality. The scales evaluated the following predictors: age, NYHA class, systolic pressure, diastolic pressure, oxygen saturation, pCO<sub>2</sub> (partial pressure of carbon

dioxide), creatinine, atrial natriuretic peptide. Only two scales evaluated were very precise and duly validated.<sup>3</sup>

Iwakami et al. evaluated the performance of existing prognostic scores in a cohort of Japanese patients with acute HF to predict 30-day mortality. It evaluated the characteristics of the derivation study and applied tools to determine biases. Of 6,340 items identified, he studied 224 models. Only 30 (13%) reported c-statistic in the derivation cohort. When the identified models were applied to the Japanese cohort, an overall c-statistic of 0.64 was found. The study found a good correlation between low risk of bias in sample selection and c-statistic. It concludes that an optimal sample in the derivation study is key to determining the performance of HF prognostic models.<sup>4</sup>

Can the predictive model proposed by Wang et al.,<sup>1</sup> or other models be applied to patients in a Latin American population? Sprockel et al.<sup>5</sup> evaluated three existing predictive models for estimating in-hospital death in patients with acute HF from a hospital in Colombia; the ADHERE, OPTIMIZE-HF and GWTC-HF models were evaluated. The study concludes that the risk scales evaluated showed a poor ability to discriminate the risk of intra hospital death.<sup>5</sup>

Studies in Latin America of external validity are definitely required to evaluate the performance, stability and reproducibility of predictive models applied in other geographical areas or, better still, carry out studies to develop and validate their own models.

### References

1. Wang L, Wang L-Q, Gu M, Li L, Wang C, Xia Y. Escore de risco clínico simples para prever a mortalidade pós-alta hospitalar em pacientes chineses hospitalizados por insuficiência cardíaca. *Arq Bras Cardiol.* 2021;117(4):615-23. doi: 10.36660/abc.20200435
2. Steyeberg E, Bleeker S, Moll H, Grobbee D, Moons K. Internal and external validation of predictive models: a simulation study of bias and precision in small samples. *J Clin Epidemiol.* 2003;56(5):441-7. doi: 10.1016/s0895-4356(03)00047-7
3. Miró O, Rossello X, Platz E, Masip J, Gualandro D, Peacock W, et al. Risk stratification scores for patients with acute heart failure in the Emergency Department: A systematic review. *Eur Heart J Acute Cardiovasc Care.* 2020;9(5):375-98. doi: 10.1177/2048872620930889
4. Iwakami N, Nagai T, Furukawa T, Tajika A, Onishi A, Nishimura K, et al. Optimal sampling in derivation studies was associated with improved discrimination in external validation for heart failure prognostic models. *J Clin Epidemiol.* 2020;121:71-80. doi: 10.1016/j.jclinepi.2020.01.011
5. Sprockel J, Alfaro L, Cifuentes J, Jiménez M, Baron R, Chaves W. Escalas de estratificación del pronóstico en pacientes con falla cardíaca aguda. *Rev Argent Cardiol.* 2016; 84(6):574-80.

### Keywords

Heart Failure/mortality; Hospitalization; Population; China; Latin America.

**Mailing Address:** Guillermo Alberto Arana Morales •  
Rua As Caviotas A1 Lote 19 Urbanização, Buenos Aires, Nuevo Chimbote -  
Província de Santa, departamento de Ancash - Perú  
E-mail: guillearana@gmail.com

DOI: <https://doi.org/10.36660/abc.2022050>



This is an open-access article distributed under the terms of the Creative Commons Attribution License