REFERENCES


eComment. EuroSCORE II - corrected in-hospital mortality rate in a modern cohort of patients undergoing cardiac surgery

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Although both additive and logistic versions of the EuroSCORE have retained very good discriminatory power, suspicions have developed concerning whether the model may now be inappropriately calibrated for current cardiac surgery [1]. Therefore, the old EuroSCORE has recently been adapted into the EuroSCORE II in order to optimize its discriminatory power and, particularly, its calibration [1]. Furthermore, any new adaptations, including the use of new methodologies [2], are welcome in order to improve the Hosmer-Lemeshow statistics.

However, I would like to use this eComment to clarify data in Table 1 (Patient characteristics) from M. Poullis’ manuscript [2]. It is obvious that Poullis [2] has used the same patient cohort that has previously been reported by Chalmers et al. [3] that is, patients who have undergone isolated coronary artery bypass grafting (CABG), isolated aortic valve replacement (AVR), isolated mitral valve surgery (MVR), combined CABG and AVR surgery, aortic surgery and miscellaneous cardiac procedures between January 2006 and March 2010 in the Liverpool Heart and Chest Hospital, Liverpool, UK.

In Table 1 of the Poullis’ manuscript [2], in the last row, we can find data that in-hospital mortality was 2.2% [101 patients out of all 5576 patients (second column) who were operated during aforementioned period, with EuroSCORE II predicted mortality of 2.0% – i.e. 112 patients]. However, those are misleading data. Indeed, 101 patients died but only in the subgroups of CABG surgery, isolated AVR surgery, isolated MVR surgery and AVR + CABG surgery. Data about mortality in aortic surgery and mortality in miscellaneous procedures (24 patients out of 350 who had aortic surgery died, and 66 patients out of 642 who had miscellaneous procedures performed) were not included in overall mortality of the entire cohort (all 5576 who were operated). Therefore, overall mortality is 191 patients out of 5576 who were operated during the period from January 2006 and March 2010. Thus corrected, in-hospital mortality of the reported cohort [2, 3] appears to be 3.43%, not 2.2%. It has recently been suggested that the calibration of the EuroSCORE II should be assessed by the observed/expected (O/E) ratio of mortality. Ideally, this ratio equals 1.0 (the observed mortality equals expected mortality, thus the predictive model is perfectly calibrated). A value above 1.0 means that the model overestimates mortality, a value below 1.0 means that model underestimates mortality. If the 95% confidence interval [CI] of the O/E ratio excludes the value 1.0, it may be considered statistically significant [4]. This leads to the conclusion that the observed to expected mortality ratio (191/112) is 1.71 (95% CI 1.47-1.95), thus not including value of 1.0. Therefore, an overall poor calibration of the EuroSCORE II model in the presented cohort of patients [2, 3] has been confirmed with the O/E ratio of mortality, as well as with Hosmer-Lemeshow statistics (P < 0.001).

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References


eComment. EuroSCORE II and its Achilles’ heel

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We read with great interest the article by Poullis [1] proposing that a recursive and non-linear regression model utilizing the EuroSCORE II risk model improves both its ROC and Hosmer-Lemeshow statistics. The European System for Cardiac Operative Risk Evaluation II (EuroSCORE II) is an updated tool for the prediction of in-hospital mortality after cardiac surgery, recently launched to replace the older additive and logistic EuroSCOREs developed in the late 1990s [2]. These previous versions have been extensively used in the last decade and have performed well, showing acceptable applicability to different populations of cardiac surgical patients [3]. However, the improvements in surgical techniques, the impact of open reporting of clinical