



ELSEVIER

European Journal of Cardio-thoracic Surgery 25 (2004) 145

EUROPEAN JOURNAL OF
CARDIO-THORACIC
SURGERY

www.elsevier.com/locate/ejcts

Letter to the Editor

The EuroSCORE does well for a single surgeon outside Europe

Marius J. Swart^{a,*}, Gina Joubert^b

^a*Suite 111, Bloemfontein Medi-Clinic Hospital,
Kellner Street, Bloemfontein 9301, South Africa*

^b*Faculty of Health Sciences, University Free State,
Bloemfontein, South Africa*

Received 16 September 2003; accepted 6 October 2003

Keywords: Calibration; CABG; EuroSCORE

Risk of death is a way to compare patient groups. A relationship between patient characteristics and in-hospital mortality can be established. Risk models designed at solitary institutions as well as models based on large multicentre databases are available. The letter by Mandel et al. has brought again the attention to the applicability of the EuroSCORE and other risk models to groups outside the original population database [1]. The question is whether these models are relevant to smaller patient series. In a recent study all the patients who had coronary artery bypass graft surgery (CABG) done by one surgeon (M.J.S.) in three hospitals in Bloemfontein, South Africa, were scored with the Parsonnet (P), Cleveland (C) and EuroSCORE (E) scores. The expected mortality score was correlated with the observed mortality as well as with major morbidity and homologous blood use. The c-index, that is the area under the receiver operating characteristic (ROC) curve, gives an estimate of validity of the scores. It is the probability that a randomly chosen death has a higher chance of mortality than a randomly chosen survivor. The Hosmer and Lemeshow goodness-of-fit-test was used as a measurement of calibration to compare the observed with the expected mortality within risk categories. A significant P -value ($P < 0.05$) indicates a lack of fit between observed and expected values.

A total number of 574 patients had a CABG. The observed mortality was 3.7% (95% CI 2.1–5.2). The predicted mortality was 7.2%, 3.8% and 3.9% for the Parsonnet score, Cleveland score and the EuroSCORE,

respectively. The c-index of all three models illustrated good validation: $P = 0.81$; $C = 0.75$ and $E = 0.80$. The EuroSCORE had the best calibration (Hosmer and Lemeshow goodness-of-fit-test had a P -value of > 0.05). The Parsonnet score and Cleveland score had P -values of ≤ 0.05 .

For each of the three risk models the risk scores of patients who died, those who had morbidity and those who had an uneventful course differed significantly. The risk scores of patients who had homologous blood transfusion differed significantly from those who did not have a blood transfusion for all three risk models.

The Parsonnet score comes from a single centre, has subjective factors and generally over estimates risk. The Cleveland score is also from a single centre; it excludes non-coronary artery surgery and could lead to gaming [2] with a high score for emergency surgery (e.g. unstable angina [3]). The EuroSCORE on the other hand is from a large multicentre database, is fit for all adult cardiac surgery and one would like to believe that it even correlates with the Society of Thoracic Surgery's assessment of risk [4]. The EuroSCORE is the preferred risk model.

References

- [1] Mandel M, Simchen ES, Zitser-Grevich Y. Does the EuroSCORE perform well on the STS population? *Eur J Cardiothorac Surg* 2003;24: 336–7.
- [2] Burack JH, Impellizzeri P, Homel P, Cunningham JN. Public reporting of surgical mortality: A survey of New York state cardiothoracic surgeons. *Ann Thorac Surg* 1999;68:1195–202.
- [3] Higgins TL, Estafanous FG, Loop F, Beck GJ, Blum JM, Parandhi L. Stratification of morbidity and mortality outcome by preoperative risk factors in coronary artery bypass patients. *J Am Med Assoc* 1992;267: 2344–8.
- [4] Nashef SAM, Roques F, Hammill BG, Peterson ED, Michel P, Grover FL, Wyse RKH, Ferguson TB. Validation of European System for Cardiac Operative Risk Evaluation (EUROSCORE) in North American cardiac surgery. *Eur J Cardiothorac Surg* 2002;22:101–5.

* Corresponding author. Tel.: +27-51-4480846; fax: +27-51-4480490.
E-mail address: mjswart@kfc.bfnmcc.co.za (M.J. Swart).