rates were higher than predicted, but not statistically different. Our data also suggest that emergency patients (high-risk patients requiring an operation within 12 h) do not sufficiently benefit from an intraoperative or postoperative IABP support because the in-hospital mortality could not be reduced. This finding might be explained by several factors. We think that besides advanced myocardial damage, systemic stress factors, such as a systemic inflammatory response, counteract the potential benefit of an IABP support. Whereas an IABP might facilitate the intraoperative weaning from cardiopulmonary bypass, long-term outcome and in-hospital mortality seem not to be reduced.

Our data do not fully answer the question when and for whom an IABP support may be helpful. Whereas we could not show a statistically significant reduction of perioperative mortality among high-risk non-emergency patients most likely because this subgroup was too small to reach significance, emergency patients with preoperative IABP insertion had a higher actual mortality than predicted by the logistic EuroSCORE. On the other hand, patients without preoperative IABP placement had the highest overall actual mortality and non-emergency patients performed significantly worse than predicted. This finding advocates an early preoperative IABP insertion to reduce mortality, at least to the predicted value.

The EuroSCORE has been the best established and validated risk model for contemporary practice [21]. The logistic EuroSCORE was shown to be superior to the standard additive EuroSCORE in predicting mortality in high-risk cardiac surgical patients [22] and could also be applied to North American cardiac surgery [23]. However, our data also show that the EuroSCORE cannot be applied to patients requiring intra- or postoperative IABP support and their actual mortality rates have been grossly underestimated. Since the EuroSCORE was developed for preoperative assessment of perioperative mortality, intra- and postoperative aggravating factors such as low cardiac output or acute renal failure cannot be considered for the calculation.

We conclude from our data that preoperative IABP support in high-risk non-emergency patients should be initiated as soon as possible because these patients seem to have a reduced EuroSCORE-predicted mortality, whereas high-risk emergency patients do not benefit from preoperative IABP support.

Intra- and/or postoperative IABP support should be used where appropriate, but EuroSCORE-based mortality rates do not reflect the actual rates and thus should be valued carefully. A further prospective, randomized controlled trial with more study participants is needed to determine for whom IABP support is truly beneficial.

References


eComment: Intraaortic balloon pump placement in various patient populations

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doi:10.1510/icvts.2007.165795A

Diez et al. [1] cover a very interesting subject, namely finding the correct indication for inserting an intraaortic balloon pump (IABP). This is important, because IABP may cause complications [2] but it may also have a significant impact on reducing mortality in certain groups of patients [3]. The authors have to be commended on collecting and analyzing large clinical material. Diez et al. draw conclusions from a comparison of predicted mortality by logistic EuroSCORE with actual observed mortality. It appears uncertain
whether the results and conclusions presented by the authors contribute to a clarification of the issue.

The material was divided into 3 groups: patients who received an IABP prior to surgery, those who received it during or after surgery and a third group who was not treated with IABP. It appears that these three groups represent different clinical entities and a direct statistical comparison seems unsound. Moreover, a statistical comparison of predicted and actual mortality in each of the subgroups is problematic for several reasons:

In the group of patients who received an IABP prior to surgery, the actual mortality was in accordance with predicted mortality. However, it is unclear why the use of IABP was not included in the EuroSCORE count. In the methods section it is stated that preoperative insertion was done on the basis of specific indications which obviously are markers of operative risk and should be included in the EuroSCORE.

An IABP was inserted intraoperatively or postoperatively in 113 patients. This group had the highest number of non-CABG-procedures, highest ejection fraction (EF) and the lowest number of emergency procedures (24%).

According to the methods section all patients were high risk with an EF below 40%. Thus, it is surprising that the mean EF in this group was 50%.

Patients who received an IABP during or after surgery (because they needed mechanical support) represent a negative selection, i.e. those who developed problems during the course of surgery. It is not surprising that the preoperative EuroSCORE doesn’t reflect actual mortality in this situation.

Patients who did not receive an IABP, but were included on the basis of their high-risk status were emergencies in 70% of cases and developed low cardiac output in 60% of cases. It is surprising that these patients did not receive an IABP. Maybe that had an impact on mortality.

It would have been interesting to compare patients with and without IABP on the basis of a matched pair comparison. This might help to find out whether IABP represents a survival advantage in this material.

References


eResponse: Intraaortic balloon pump placement in various patient populations

Authors: Claudiaus Diez, Department of Cardiothoracic Surgery, University Regensburg, Regensburg 93053, Germany; Rolf-Edgar Silber, Michael Wächner, Markus Stiller, Hans-Stefan Hofmann
doi:10.1510/icvts.2007.165795a1

We thank Dr. Wahba for his valuable comments because he addressed several critical issues of our study [1].

We think that the exclusion of the preoperative IABP placement in the EuroSCORE calculation is justified because it is the score before IABP insertion that will influence the decision to place it. Although we proposed specific indications for IABP placement, the final decision was made on the basis of the EuroSCORE result before the IABP was inserted.

We agree with Dr. Wahba that the analysis of patients with intra- and postoperative IABP might be a negative selection and a statistical comparison seems unsound. Their mean EF was slightly higher than 40% and we should have stated that in the methods section. Indeed, these patients were not intended to receive an IABP (e.g. lowest number of emergency procedure, highest EF) and the EuroSCORE does not reflect the actual mortality. But it also shows that scoring systems that try to approximate the perioperative risk from a preoperative parameter only, may, under some circumstances, not be very helpful in making statements on the actual outcome after cardiac surgery.

We included the analysis of 92 patients (from a three-year period) without any IABP support to compare the outcome between patients with and without preoperative IABP placement. The demographic data and comorbidities were quite similar compared to patients with preoperative IABP. The decision not to insert an IABP was mainly based on the surgeon’s individual decision and might be influenced by several conditions (e.g. good clinical appearance, contraindications for IABP, severe peripheral vascular disease). The mortality between patients with and without IABP insertion was statistically not significant. However, the latter experienced a longer ICU- and overall hospital stay.

We agree with Dr. Wahba’s suggestion for a matched pair comparison. His suggestion is one way to analyze the outcome.

Reference


eComment: Using EuroSCORE to select patients for prophylactic IABP

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doi:10.1510/icvts.2007.165795b

We congratulate this group for attempting to address what we regard as a very interesting and practical point [1].

There is some evidence that preoperative elective placement of an IABP in high risk patients prior to cardiac surgery may improve their outcomes. However, the complications of IABP placement are significant. Therefore the question of interest is how to define a high risk patient so that the risk to benefit ratio is favourable. The use of a preoperative risk calculator would be ideal as it would be easily reproducible in any cardiac surgery centre and therefore the results of any trials or observational studies could easily be reproduced.

The authors of this study imply in the title of their study that they have used the EuroSCORE to select suitable patients for preoperative IABP placement. However, this is a retrospective review and they have made no attempt to analyse the population who received an IABP preoperatively based on their EuroSCORE. The preoperative placement population should be divided into low, intermediate and high risk groups using the EuroSCORE and the survival of these groups assessed and compared to similar EuroSCORE patients who did not receive a preoperative IABP. Our previously published work cited by the authors does this and we found that patients with a preoperative additive EuroSCORE of >5 were the patients who benefited most from preoperative IABP placement [2]. We agree with the practise of this study however in not including the preoperative IABP in the EuroSCORE calculation for this group. The utility of the score is in the decision making regarding the placement of an IABP in an otherwise stable patient. It is the score of the patient before the IABP is placed that will influence the decision to place it.

This study used 175 IABPs in a population of 267 (65%) and used 85 IABPs to wean patients from cardiopulmonary bypass support. This is a very significant IABP usage and must be significantly higher than the majority of centres. The analysis of intra and postoperative IABP placement we feel is a distraction from the main question. These patients are having IABP placed in result to contemporaneous clinical need. Whereas the most interesting group is the patients who have IABP placed in anticipation of future benefit where no immediate need is perceived.

References


eResponse: Using EuroSCORE to select patients for prophylactic IABP

Authors: Claudiaus Diez, Department of Cardiothoracic Surgery, University Regensburg, Regensburg 93053, Germany; Rolf-Edgar Silber, Michael Wächner, Markus Stiller, Hans-Stefan Hofmann
doi:10.1510/icvts.2007.165795b1
We thank Dr. Healy for his valuable comment on our study [1]. He addressed the issue of the risk to benefit ratio in the patients receiving an IABP. We completely agree with him about using a preoperative risk calculator to define high-risk patients and their potential outcome. Since the definitions may differ from one center to another, the results of studies prove to be difficult to reproduce. Apart from our retrospective study, we conducted a prospective, randomized trial to determine the effects of preoperative IABP insertion on mortality. We still analyze the data and hope to present the results within the next months. In this study, the population with preoperative IABP insertion is going to be analyzed based on their EuroSCORE, as suggested by Dr. Healy. It is a clear drawback of our current study not to have done this. We also agree that the analysis of intra- and postoperative IABP placement might be a distraction from the main question.

Indeed, our data might easily be misunderstood. The sample comprised 175 patients with IABP insertion. Eighty-five of those patients received the balloon for weaning. According to a reviewer’s suggestion, we included a similar (‘pseudomatched’) control group (92 patients) without any IABP support. However, this number did not reflect the total number of patients operated on during the study period (> 3000) and thus the overall frequency of an IABP insertion is much lower as assumed by Dr. Healy.

Reference