VALIDATION OF EUROSCOR II IN EGYPTIAN CABG PATIENT

Thesis

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By

Khaled Mortada Mohammed Elsayed
Assistant lecturer

Under Supervision of

PROF. DR. YahiaBalbaa Anwar Balbaa
Professor of Cardiothoracic Surgery,
Faculty of Medicine, Cairo University

PROF.DR.Mohamed Ibrahim Ahmad Sewielam
Professor of Cardiothoracic Surgery
Faculty of Medicine, Cairo University

LECTURER .DR. Fouad Mohammed Said Rassekh
Assistant Professor of Cardiothoracic Surgery
Faculty of Medicine, Cairo University

Faculty of Medicine
Cairo University
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Abstract

The aim of the present study is to validate the applicability of EuroSCOREII as a preoperative predictive scoring system of mortality for Egyptian patients undergoing coronary artery bypass grafting surgery.

A randomized prospective study was done including Patients with I.H.D. undergoing isolated CABGsurgery performed by EL KasrELAinystaff.
Total patients number was 545 patients from which 2 patients did not had the operation and 25 patients were excluded due to associated valve lesion so 518 patients were included from which 15 patients died.
According to data of patients who shared in this study and after calculation of EuroSCORE II for each patient, calculation of the mean EuroSCOREII was 1.1325%, 15 cases of postoperative mortality were recorded presenting 2.89% of the whole study.

The area under receiver operating characteristic curve (AUC) was 0.675 which means that EuroSCORE II isn't predictive of mortality in Egyptian CABG patients.

Key words:

EuroSCOREIICABGmortalityEgyptian ROC curve

500 patientsvalidation EL KasrELAiny

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Introduction

Risk prediction in current cardiac surgical practice plays an important role in surgical decision-making preoperative patient education& consent, it also enable comparison between centers.

Despite technological advancements, open-heart operations still carry a risk of mortality and morbidity.

Preoperative risk scores are an essential tool for risk assessment, cost benefit analysis, the study of therapy trendsandto aid in the selection of patients for cardiac surgery, Various score systems have been developed to predict mortality after adult heart surgery.**(Roques F, NashefSAM et al., 1999).**

Operative mortality is also increasingly used as an indicator of the quality of cardiac surgery.**(Dubois RW, Rogers WH et al .,1987)**

Although all of these score systems are based on patient derived data, such as age, gender, comorbidity, and so forth, there are considerable differences between scores with regard to their design and validity.
As quality control and cost-benefit analysis have gained new relevance with recent developments in the health care system, selection of appropriate score systems for the evaluation of hospital performance has become an important issue.

With no knowledge of the current risk profile of Egyptian cardiac surgical patients, crude mortality rate in a center was once used as a risk indicator in Egypt, although it is usually not related to preoperative risk factors.

The European system for cardiac operative risk evaluation (Euroscore II) aiming to predict 30-day mortality of the European cardiac surgical patients is now the most widely used risk prediction algorithm in Egypt.

Owing to its validation in European, North America and Japanese populations, however validation of Euroscore II model has never been tested in Egypt.

Hence there is a doubt as to whether or not the European model for risk prediction was appropriate in Egypt.

Over the last decade patients undergoing coronary artery bypass graft (CABG) have been increasing rapidly in Egypt due to increasing number of I.H.D. we have therefore to analyze the prediction ability of Euroscore II on the patients undergoing CABG in Egypt aiming to assess the applicability of the Euroscore II in egyptian patient undergoing CABG.

Hence the specific questionis to be addressed primarily:

Is the EuroscoreII an accurate operative risk predictor for CABG in Egypt?

Introduction to CABG

Historical background

By following the history of myocardial revascularization worldwide, it is clearly visible that it passed progressive sequential steps. In 1962, a cardiac surgeon by the name of Sabiston conducted the first unsuccessful saphenous vein graft from the ascending aorta to the distal right coronary artery and the patient died 3 days later. The technique was then pioneered by Argentinian René Favaloro and others at the Cleveland Clinic in the late 1960s. The next major development was in 1970, when the internal mammary artery was used as a bypass conduit to the coronary arteries. By the mid 1970s, many centers in the United States, Australia, and Europe were performing CABG with low peri-procedural mortality, and a high rate of pain relief **(PollickC 1993, Keenan and Chou 1998).**The first minimally invasive cardiac surgery/coronary artery bypass grafting was performed on January 21, 2005, at what was then The Heart Institute of Staten Island by a highly trained team led by Dr. Joseph McGinn.

Between (1972) and (1984) several randomized trials compared medical and surgical therapy for the treatment of atherosclerotic CAD. The two major trials, the Coronary Artery Surgery Study (CASS)**,(Eagle et al., 2004)** and the European Coronary Surgery Study (ECSS)**(Hawkes et al., 2006)**demonstrate the greatest survival benefit of revascularization to be among those patients at highest risk.

Timing of operation:

Preoperative hemodynamic instability and/or unstable angina often prompt urgent or emergent surgery. In stable patients, factors to be consider when planning the timing of surgery include the time since cardiac catheterization, the administration of nephrotoxic medications or agents, and the baseline creatinine due to the risk of postoperative renal dysfunction **(Duddakula K et al., 2007).**

Caution should be taken in the stable patient with an acute myocardial infarction in the setting of poor left ventricular function. Allowing recovery from the acute event prior to surgery may decrease morbidity and mortality **(Lee DC et al., 2007).**

Prohibitory systemic illnesses may also indicate a need for further work up or delay in elective surgery as well as additional consultations. Consideration should also be made for a delay in the stable patient when preoperative antithrombotic therapy has been administered due to the increased risk of perioperative bleeding.

Outcome:

Mortality :

Worldwide interest has increased over the last 10 years in evaluating hospital performance through the assessment of actual results of patients care. Outcome based quality assessment in health care has been a growing interest for policymakers, administrators and clinicians. The most significant examples of outcomes studies are mainly related to cardiac surgery, particularly to coronary artery by-pass graft (CABG) and come from the United States, Canada and the United Kingdom **(Ferguson TB, Hammil BG, Peterson ED et al ., 2002).**

These studies allowed the public to have systematic access to health performance results of each hospital and documented wide variations between surgeons, hospitals and regions in post-CABG mortality that persist despite statistical adjustment for differences in patients case-mix.

In fact, in order to control for confounding, when centres outcomes are compared, it is mandatory to take into account and control the potential effect of centers being heterogeneous with regard to variables which describe the severity of the disease for which the patient is being treated and his individual preoperative risk.**(Ugolini C, Nobilio L et al., 2004).**

In Egypt there is no surveillance system aimed to regularly assess the outcomes of hospital care. A few isolated initiatives were made during the last decade, but they were at the regional level and involved only a limited number of hospitals .

Early in hospital mortality from primary coronary artery bypass surgery has seen a steady decline from the 1970s into the 1990s. Recently, however, the patient population referred for coronary artery bypass has become increasingly complex; hence the decline has plateaued in recent years.

Older patient, more advanced and diffuse coronary artery disease, worsening left ventricular function, failure of multiple previous percutaneous manipulation, more serious comorbidities, and a greater frequency of reoperation have contributed to an increase in perioperative risk. Therefore only risk adjusted outcome data can be truly informative.

Currently, the overall operative mortality rate for CABG is about 3 percent, elective primary CABG carries a mortality rate of 1.2 percent, according to the database of the Society of Thoracic Surgeons.

A) Possible complications of CABG surgery (morbidity):

- ## Graft failure or coronary spasm:

Graft patency may be enhanced by the administration of antiplatelet agents including aspirin and/or Plavix that are reinstituted when safe, the use of inotropes or mechanical support to maintain an adequate cardiac output, and the use of calcium channel blockers or nitrates for the prevention of arterial graft spasm **(Maniar HS et al., 2002).**

- ## Infection:

The STS 2008 Report observed rate of deep sternal wound infection was 0.4%(risk adjusted 0.3%) in patients undergoing isolated CABG. Perioperative intravenous antibiotics are administered prior to incision and continued for 48 hours or less postoperatively. Additional antibiotic use should be guided by specific culture and sensitivity studies. In addition, aggressive blood sugar management (often with insulin infusion) is utilized to limit the occurrence of sternal wound infection **(Gandhi GY et al., 2005,Guvener M et al., 2002 and Furnary AP et al., 2003*).***

- ## Postoperative bleeding/early tamponade:

Appropriate surgical hemostasis should be obtained prior to chest closure to avoid postoperative bleeding. Tamponade requires immediate operative drainage