Risk Stratification and Mortality Outcomes of Indian Valvular Heart Surgery Patients Using EuroSCORE II: A Prospective Observational Study

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Abstract

Background: Risk stratification tools like EuroSCORE II are critical for preoperative assessment in cardiac surgery, but their applicability in Indian patients undergoing valvular heart surgery remains unclear.

Objective: To analyze the relationship between EuroSCORE II risk categories and actual observed versus predicted mortality outcomes in Indian patients undergoing valvular heart surgery.

Methods: A prospective observational study was conducted on 56 patients undergoing elective or urgent valvular heart surgery at Sher-i-Kashmir Institute of Medical Sciences, Srinagar, India. Patients were categorized into four EuroSCORE II risk groups. Observed mortality was compared with predicted mortality in each group.

Results: Mortality was underestimated by EuroSCORE II in moderate and high-risk categories. Predicted vs. observed mortality: Very Low (0.68% vs. 0%), Low (1.61% vs. 5.6%), Moderate (4.55% vs. 8.3%), High (8.96% vs. 23.1%).

Conclusion: EuroSCORE II underestimates mortality risk in Indian patients. Regional recalibration or a new predictive model is needed.

Keywords

EuroSCORE II, Valvular Heart Surgery, Risk Stratification, Mortality Outcomes, India

Introduction

Valvular heart disease is a major cardiovascular burden in developing nations such as India, where rheumatic heart disease predominates. Preoperative risk stratification is crucial for optimizing surgical outcomes and guiding clinical decisions.

EuroSCORE II is widely applied internationally, but it was developed predominantly on European populations. Its validity for Indian patients undergoing valvular surgery remains uncertain. This study evaluates the accuracy of EuroSCORE II in stratifying Indian patients into risk categories and compares observed vs. predicted mortality.

Materials and Methods

This prospective observational study was conducted from 2018 to 2021 in the Department of Anaesthesiology and Critical Care at Sher-i-Kashmir Institute of Medical Sciences, Srinagar.

Inclusion criteria: Age >18 years, ASA I–IV, patients undergoing elective or urgent single-valve surgery. EuroSCORE II was calculated for each patient using the online calculator and categorized into Very Low (<1%), Low (1–2.99%), Moderate (3–4.99%), and High (>5%). Observed mortality was recorded at one month post-surgery. Descriptive statistics were used for analysis.

Results

A total of 56 patients were enrolled (Mean age 48.6 ± 12.21 years; 46.4% male, 53.6% female). Critical preoperative state was present in 48.2% of patients, and 25% had diabetes on insulin.

EuroSCORE II Risk Category	Number of Patients	Predicted Mortality (%)	Observed Mortality (%)
Very Low (<1%)	13	0.68	0.0
Low (1–2.99%)	18	1.61	5.6
Moderate (3–4.99%)	12	4.55	8.3
High (>5%)	13	8.96	23.1

Discussion

The study demonstrates that EuroSCORE II underestimates early mortality risk in Indian valvular heart surgery patients, particularly in moderate and high-risk categories.
Possible reasons include differences in patient demographics (younger patients with uncontrolled comorbidities), socioeconomic barriers affecting postoperative care, and a predominance of rheumatic disease.
Findings are consistent with earlier Indian studies validating EuroSCORE II but highlight the urgent need for region-specific recalibration or development of a new predictive model.

Conclusion

EuroSCORE II shows limited accuracy for Indian valvular surgery patients. A region-specific model is recommended to improve preoperative risk prediction and patient outcomes.

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