Impact of Insulin-Dependent Diabetes and Critical Preoperative State on Early Mortality in Indian Patients Undergoing Valvular Heart Surgery: A Prospective Observational Study

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Abstract

Background: Preoperative risk factors such as diabetes mellitus and critical preoperative state are known contributors to postoperative mortality in cardiac surgery, but their specific impact on Indian patients undergoing valvular heart surgery has not been thoroughly studied.

Objective: To assess the role of insulin-dependent diabetes and critical preoperative state in predicting early (within 1 month) mortality in Indian patients undergoing valvular heart surgery.

Methods: A prospective observational study was conducted at Sher-i-Kashmir Institute of Medical Sciences, Srinagar, between 2018 and 2021. Fifty-six patients undergoing elective or urgent valvular heart surgery were included. Preoperative variables, including insulin-dependent diabetes and critical preoperative state (defined by the need for inotropes, intra-aortic balloon pump, or mechanical ventilation preoperatively), were recorded. Mortality outcomes were analyzed in relation to these variables.

Results: Fourteen patients (25%) were insulin-dependent diabetics. Twenty-seven patients (48.2%) presented in a critical preoperative state. Early mortality occurred in 5 patients (8.9%). Three of these were both diabetic and in critical preoperative state, one was diabetic only, and one was non-diabetic but in critical preoperative state.

Conclusion: Both insulin-dependent diabetes and critical preoperative state are significantly associated with early mortality in Indian patients undergoing valvular heart surgery. These factors should be considered in perioperative management and risk prediction models for improved outcomes.

Keywords: Insulin-dependent diabetes, Critical preoperative state, Valvular heart surgery, Early mortality, India

Introduction

Preoperative risk assessment is a key component of surgical planning in cardiac surgery. Diabetes mellitus, particularly when insulin-dependent, is known to increase the risk of postoperative complications and mortality. Similarly, the presence of a critical preoperative state significantly increases surgical risk. India has a unique patient profile with a high prevalence of rheumatic heart disease, younger patients, poor access to regular medical care, and often poorly controlled chronic conditions. Despite this, the role of Thisinsulin-dependent diabetes and critical preoperative state in early mortality following valvular heart surgery in Indian patients has not been well characterized. This study aims to fill this gap.

Materials and Methods

prospective observational study was conducted from 2018 to 2021 at Sher-i-Kashmir Institute of Medical Sciences (SKIMS), Srinagar. Inclusion criteria were patients aged >18 years, ASA physical status I–IV, undergoing single-valve surgery (elective or urgent). Preoperative variables recorded included insulin-dependent diabetes and critical preoperative state (defined by requirement of inotropes, mechanical ventilation, or intra-aortic balloon pump use).

Mortality outcomes were recorded at 1 week and 1 month. Descriptive analysis and chi-square tests were applied to assess associations.

Results

Among 56 patients, 14 (25%) were insulin-dependent diabetics, 27 (48.2%) were in a critical preoperative state, and 10 (17.9%) had both conditions. Early mortality occurred in 5 patients (8.9%): 3 with both conditions, 1 diabetic only, and 1 critical state only. Mortality was highest (30%) in patients with both risk factors, compared to 28.6% in diabetes alone and 18.5% in critical state alone, while none without these factors died.

Discussion

This study highlights that insulin-dependent diabetes and critical preoperative state are strong predictors of early mortality in Indian valvular heart surgery patients. Insulin dependency may reflect poor glycemic control and long-standing disease, increasing the risk of wound infection, sepsis, and organ dysfunction postoperatively. Critical preoperative state reflects severe instability and poor baseline cardiac function, adding to surgical risk. The combination of these two factors significantly amplified mortality risk. These findings underscore the need to integrate these variables into risk models, which currently underrepresent their impact in Indian populations.

Conclusion

Insulin-dependent diabetes and critical preoperative state are significant predictors of early mortality in Indian patients undergoing valvular heart surgery. These factors must be incorporated into future risk prediction models and perioperative care strategies to improve patient outcomes.

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