



Patient Comorbidities are Associated with Development of Postoperative Delirium

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Introduction

Post-operative delirium (POD) is a condition observed in adult patients undergoing cardiovascular surgery.¹⁻³ It is known to result in prolonged hospitalization, increased healthcare costs, and greater morbidity.¹ Although studies have focused on the intra-operative or post-operative phases of cardiovascular surgery and association with POD, little information is reported relating to the pre-operative risk factors in this population. This study explores the association of adult patient comorbidities on the occurrence of POD following cardiovascular surgery.

Methods

Following IRB approval, patient characteristics (age, sex, and BMI), twelve separate comorbidities, and the occurrences of POD were the measures of interest in 852 adult patients undergoing cardiovascular surgery between January of 2020 and February of 2025. Data was manually collected via electronic medical record chart review and recorded in JMP® 18 for statistical analysis. Outcomes of interest included relative risk, risk differences, and odds ratios. Key analyses included 95% confidence intervals (CI). Additionally, an overlay plot displaying incidence of POD was run to rule out possible confounders during the study period.

Table 1:Baseline Characteristics in Adults Undergoing Cardiovascular Surgery

Variables	Patients n=852
Age, median years [IQR]	63 [54-70]
Sex [Female] (%)	271 (33)
BMI, median [IQR]	29 [25-33]

BMI: Body mass index (kg/m²); IQR: 25-75% interquartile range.

Table 2: Relative Risk, Risk Difference and Odds Ratios of Comorbidities Associated with Postoperative Delirium in 852 Adults Patients Following Cardiovascular Surgery

X Column	Relative Risk		Risk Difference		Odds Ratio	
Cardiomyopathy	1.14		0.11		2.50	
Congestive heart failure	1.12		0.10		2.76	
Non-sinus dysrhythmias	1.11		0.10		2.74	
Chronic renal insufficiency	1.10		0.09		2.18	
Chronic liver disease	1.05		0.05		1.52	
Diabetes mellitus	1.05		0.04		1.50	
COPD	1.04		0.04		1.43	
Systemic Hypertension	1.01		0.01		1.06	
Reactive airway disease	1.00		-0.00		0.99	
Coronary artery disease	0.99		-0.01		0.95	
Current tobacco use	0.98		-0.01		0.86	
Peripheral vascular disease	0.98		-0.02		0.79	

References

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Results

Baseline patient characteristics are shown in Table 1. The incidence of POD was 10.9%; CI 8.9-13.2%. Relative risk, risk differences, and odds ratio comparisons with their CIs on the association of twelve separate patient comorbidities to POD are shown in Table 2. Patients with history of cardiomyopathy, congestive heart failure, non-sinus dysrhythmias, and chronic renal insufficiency were associated with POD (Table 2).

Conclusion

These results suggest that patient comorbidities play a role in the development of POD. Specifically, cardiomyopathy, congestive heart failure, non-sinus dysrhythmias, and chronic renal insufficiency were associated with development of POD. These findings highlight the importance of comprehensive pre-operative evaluations, particularly in identifying high-risk patients who may benefit from enhanced monitoring or prophylactic strategies. Prior research has largely emphasized intraoperative or postoperative contributors to POD,² while this study suggests that pre-existing health status significantly influences outcomes. Further research should validate these associations and facilitate pre-operative optimization to minimize the development of POD in adult patients undergoing cardiovascular surgery.