

1058-73

Microsimulation to Support Prosthetic Aortic Valve Selection

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Background. Prognosis after aortic valve replacement (AVR) is determined by multiple inter-related factors, and objective selection of the preferred valve substitute can be difficult. Standard statistical methods do not allow detailed insight into the factors that affect outcome in the individual patient.

Methods. The use of a microsimulation state-transition model to predict age- and gender-specific outcome is illustrated using meta-analyses on the occurrence of valve-related events and outcome after AVR with different valve substitutes (bileaflet mechanical valves (N=2986), stented bioprostheses (N=5837), allografts (N=629) and autografts (N=380)). The microsimulation model uses the meta-analysis information to generate a large number (10,000) of age and gender-specific life histories of patients after AVR, allowing detailed insight into all probable outcomes after AVR for patients with this specific age and gender. The impact of valve-related events, excess mortality due to heart valve disease, and other non-valve-related events on survival can thus be quantified.

Results. Compared to healthy age-matched people, life expectancy of patients after AVR is markedly reduced, especially at a younger age. For a 40-year-old male patient mean life expectancy after AVR is reduced from 35 to 19-20 years, depending on the type of prosthesis used. This reduction is mainly due to excess mortality (14 years), while valve-related events play a minor role (1-2 years). Reoperation for structural valve deterioration is common in younger patients with tissue valves, causing 4-5% of all deaths for patients aged 40, depending on the type of tissue valve. On the other hand, younger patients with mechanical valves have a high lifetime risk of suffering thrombo-embolic and bleeding events, causing for example 4% of mortality in patients aged 40 years.

Conclusion. Microsimulation allows detailed insight into the factors that affect outcome after AVR. Valve-related events play a minor but important role, since their effect on life expectancy can be minimized by choosing the 'best' valve substitute for the individual patient. In this respect microsimulation is a useful and objective decision support tool.

POSTER SESSION

1077 Quality of Care for Cardiovascular Disease

Monday, March 08, 2004, 9:00 a.m.-11:00 a.m.

Morial Convention Center, Hall G

Presentation Hour: 10:00 a.m.-11:00 a.m.

1077-67

Guideline-Based Standardized Care Substantially Reduces Mortality in Medicare Patients With Acute Myocardial Infarction: The American College of Cardiology's Guidelines Applied in Practice Program in Michigan

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Background: It has been shown that the American College of Cardiology (ACC) Guidelines Applied in Practice (GAP) program improves adherence to key evidenced-based therapies in acute myocardial infarction (AMI), particularly when standardized care tools are used. To assess the impact of GAP on mortality, we studied 30-day and 1-year (yr) mortality in 2857 Medicare Beneficiaries cared for at 33 hospitals in Michigan during the 3 GAP projects.

Methods: We compared baseline features, in-hospital treatments, and outcomes in 1368 patients cared for prior to GAP and 1489 patients treated after GAP. Logistic regression models were built to identify clinical variables predictive of 30 day and 1-yr mortality. We tested effects of the GAP project and the use of standard orders and discharge tool on mortality.

Results: Pre and post GAP patients were similar in demographics, clinical presentation, co-morbidities and complications. Multivariate predictors of mortality were old age, heart failure, increased heart rate, chest pain, atrial fib, MI location, anemia, LVEF, troponin level, and PCI /CABG: 0.76 C-statistic. Both GAP and use of standardized care tools were associated with significantly lower 30 day and 1-yr mortality.

Conclusions: The ACC AMI GAP program is associated with a reduced 30-day and 1-yr

mortality among Medicare Beneficiaries. This independent and substantial mortality reduction is realized in patients who receive system-based care with standard, guideline-based orders and/or discharge tools.

In-hospital, 30 day and 1-year Mortality Rates

	GAP	No GAP	p value	Odds Ratio	Care Tools	No Tools	p value	Odds Ratio
In hospital	10.7%	13.6%	0.017	-----	8.7%	13.1%	0.0009	-----
30 day	16.7%	21.6%	0.001	1.35 (CI 1.07-1.70)	13.6%	22.4%	<0.0001	1.73 (CI 1.27-2.35)
1 year	33.2%	38.3%	0.004	1.28 (CI 1.06-1.56)	29.3%	40.7%	<0.0001	1.39 (CI 1.08-1.80)

1077-68

Decreasing Mortality in Primary Percutaneous Coronary Intervention in Northern New England Is Related to Efforts at Regional Quality Improvement

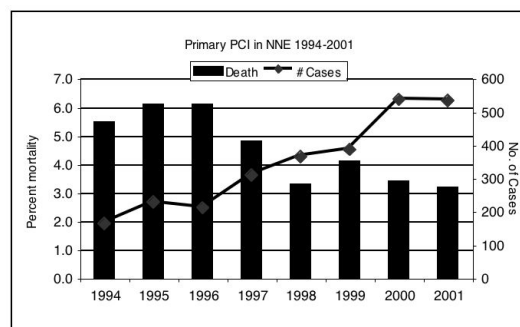
Theodore Silver, Mirle Kellett, Jr., Winthrop Piper, Michael Hearne, Peter VerLee, Thomas Wharton, John Robb, Matthew Watkins, David Malenka, for the Northern New England Cardiovascular Disease Study Group, Dartmouth-Hitchcock Medical Center, Lebanon, NH

Background: Primary PCI has become the treatment of choice for STEMI and a focus of quality improvement efforts (e.g., early recognition, decreased door-to-balloon time) in Northern New England hospitals. We hypothesized that these efforts would be temporally associated with lower in-hospital mortality for this patient population.

Methods: We studied 3,013 consecutive cases of primary PCI contributed by 8 hospitals to the Northern New England PCI Registry from 1994 to 2001 to assess changes in case-mix and in-hospital mortality.

Results: Over the study period annual caseload increased from 165 to 535 (Figure). Case-mix remained stable over time. Crude mortality declined significantly from 6.1% to 3.2% (ptrend=0.01), as did adjusted mortality (ptrend=0.01), and was observed at all institutions. The declining mortality was seen across patient subsets including those over age 70 (ptrend=0.02), women (ptrend=0.08), those with left main disease (ptrend=0.01), and in patients with multivessel disease (p=0.10).

Conclusion: Since 1994 regional mortality associated with primary PCI has decreased by 48%. While likely multifactorial, it was clearly concurrent with regional efforts at quality improvement.



1077-69

Underutilization of Effective Treatment in Diabetic Patients Admitted With Acute Myocardial Infarction

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Background

Diabetic patients suffering acute myocardial infarction (AMI) have significantly higher mortality compared with non-diabetic patients. While it has been demonstrated that thrombolytics are underused in diabetic patients, it is unclear whether other effective therapies are also underutilized.

Methods

We analyzed the Enhanced Feedback for Effective Cardiac Treatment (EFFECT) database, an initiative to improve care that collected information for patients admitted with an AMI in Ontario, Canada during 1999 to 2001.

Results

There were 7,207 AMI patients, 25% had diabetes and 75% did not. Diabetic AMI patients were significantly older (71 vs 68 years), more likely to be female (41% vs 34%), had higher likelihood of comorbid conditions, and had higher adjusted mortality at 30-days (14% vs 11%). Among ideal candidates, aspirin and beta blockers were prescribed less often both on admission and at discharge in diabetics. However, ACE inhibitors were prescribed more often compared with non-diabetics at discharge. (Table)

Conclusions

Despite higher risk of death, life-saving therapies such as aspirin and beta blockers are substantially underutilized in diabetic patients with AMI. Improving the quality of care in