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Clinical Outcomes of Pericardial Effusions in End-Stage Renal Disease: Pericarditis-associated versus Asymptomatic.

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Type of submitter

Fellow in Training

Abstract

Background:

The clinical outcomes associated with pericardial effusions related to uremic pericarditis have not been clearly differentiated from asymptomatic effusions in patients with end-stage renal disease (ESRD). Although it may seem logical that anti-inflammatory therapy would alter the course of pericardial effusions related to uremic pericarditis, it remains unknown whether there is a clear impact.

Objectives:

Our objectives are: 1) to assess whether pericardial effusions associated with uremic pericarditis are more likely to result in pericardial drainage and/or mortality than asymptomatic pericardial effusions in similar ESRD patients; and

2) to assess whether anti-inflammatory therapy decreases the need for pericardial drainage in patients with pericardial effusions associated with uremic pericarditis.

Methods: This single-center, retrospective study identified patients with pericardial effusions associated with uremic pericarditis (n=71) and asymptomatic pericardial effusions in ESRD (n=89), from the Cleveland Clinic Pericardial Center database (n= 5,366) collected from 2007-2016. Pericardial drainage and the combination of pericardial drainage and mortality were the outcomes measured. Multivariable logistic regression models adjusted for age, gender, and size of the effusion were used to examine the association between the type of pericardial effusion and the outcomes, as well as between the use of medical therapy and the rate of pericardial drainage.

Results: Patients with acute uremic pericarditis received more pericardial drainages compared with asymptomatic uremic pericardial effusions (58% versus 31%, p=0.001). After adjusting for age, gender and size of the effusion, the odds of mortality and the need for pericardial drainage increased significantly for those patients with acute pericarditis (OR: 3.26, CI: 1.61-6.50, p<0.001). Medical therapy was not associated with a decreased need for pericardiocentesis (OR: 0.98, CI 0.29-1.72, p=0.827).

Conclusion: Pericardial effusions associated with uremic pericarditis have worse outcomes (rate of pericardial drainage and mortality) than asymptomatic pericardial effusions in ESRD. The use of anti-inflammatory therapy did not reduce the rate of pericardial drainage in uremic pericarditis in our sample. Our study indicates that the contemporary management of uremic

pericarditis lacks agreement when selecting optimal medical therapy, and calls for further investigations and consensus guidelines

Categories

1st year Fellow: Research

Program Name

Cleveland Clinic Foundation

32

Oral Anticoagulant use in patients with STEMI increases bleeding complication and prolong length of stay.

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Type of submitter

Fellow in Training

Abstract

Background:

The use of oral anticoagulants (OAC) continues to increase in clinical practice. The outcome of primary PCI in patients taking OAC is not clear. Hence this retrospective study is designed to answer this question.

Methods:

All patients with STEMI who underwent Primary PCI and who were also taking OAC from Jan 1st, 2015 to March 31st, 2018 were included. Outcomes including length of stay, bleeding event within 72 hours, bleeding at access site and non-access site were recorded. Standard definitions for bleeding events were used as per CathPCI version 4.4.

Results:

729 patients presented with STEMI during the study period. 28 (3.8%) patients with STEMI on OAC were included. 2 patients were excluded since primary PCI was not performed. 26 patients were included for analysis. Warfarin was used in 11 patients, Dabigatran in 2, Rivaroxaban in 9 and Apixaban was used in 4 patients. 5 patients (19.2%) had a bleeding event within 72 hours. 80% of the bleeding events happened in patients taking warfarin. Bleeding at access site and non-access site was 11.5% each. 2 patients received blood transfusion. Overall Length of stay (LOS) was 4.46 days. LOS was significantly higher in patients who had bleeding event compared non-bleeding group (8.8 vs 3.4 days). Our observed bleeding rates were significantly higher than reported STEMI outcomes using CathPCI registry.

Conclusion:

STEMI patients on OAC had more bleeding complications, and length of stay is significantly prolonged in patients with bleeding events. Patients on warfarin appears to have more bleeding events compared to newer oral anticoagulants. Larger sample size is needed to validate these findings.

Categories

2nd year Fellow: Research

Program Name

Canton Medical Education Foundation/ Aultman Hospital

5

Similar Outcomes at 5 Years in Patients With Radiation-Associated Aortic Stenosis Undergoing TAVR vs. SAVR

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Type of submitter

Fellow in Training

Abstract

Background: Cardiac disease after mediastinal radiation therapy (XRT) for thoracic malignancy frequently manifests as severe aortic stenosis (AS). We previously demonstrated that patients with severe AS undergoing surgical aortic valve replacement (SAVR) have significantly worse longer-term survival than a matched cohort without a history of thoracic XRT despite similar AS severity. We sought to study outcomes of patients with XRT-associated severe AS who underwent transcatheter AVR (TAVR) vs. SAVR.

Methods: We studied 196 patients with XRT-induced symptomatic severe AS [98 underwent SAVR (age 64±11, 62% female) and 98 underwent TAVR (66±11, 63% female)], matched them in a 1:1 fashion (based on age, gender and aortic valve area).

Results: Baseline data are shown in Figure 1. Only 25% SAVR patients had isolated AVR, while 79% TAVR patients had transfemoral approach (19 coronary interventions). SAVR was associated with significantly longer in-hospital length of stay (16±13 vs. 6.9±6 days, p<0.001). At 5-year follow-up, there were 50 (26%) deaths. Multivariable Cox Survival analysis demonstrated that increasing Society of Thoracic Surgeons score (hazard ratio or HR 1.36 [1.05-1.77]) and reduced left ventricular stroke volume index (HR 1.03 [1.01-1.05]) were associated with increased 5-year mortality, while TAVR vs. SAVR (HR 0.85 [0.62-1.17], p=0.32) was not. 1, 2, 3 and 5 year survival in TAVR was 91%, 86%, 79%, 65%, and 86%, 80%, 76%, 66% in SAVR (Kaplan-Meier curves for 5-year survival, Figure 2).

Conclusion: In carefully patients with XRT-associated severe AS, despite slightly better 1 and 3-year survival in TAVR vs. SAVR, 5-year outcomes are similar.

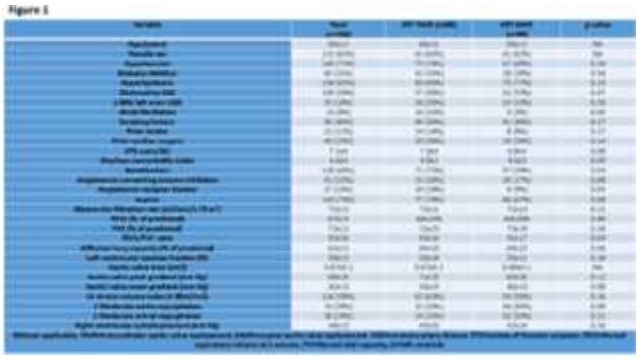
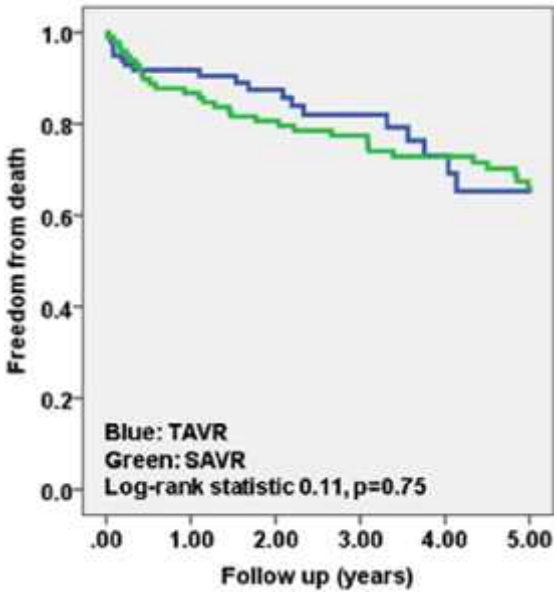


Figure 2



Categories

2nd year Fellow: Research

Program Name

Cleveland Clinic

4

The Comparative Effectiveness of Carvedilol versus Metoprolol on 30 day Readmission in Patients with Chronic Heart Failure

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Type of submitter

Fellow in Training

Abstract

INTRODUCTION: The study sought to evaluate whether Carvedilol use was associated with improved 30 day readmission rates and all cause mortality when compared with Metoprolol succinate in real-world patients with chronic heart failure in a community hospital in Kettering, Ohio.
It is well established that beta blockers improve outcomes with patients with systolic heart failure. It is unknown whether this benefit is class effect or if there is superiority between specific agents. There is a general paucity of real-world evidence that the use of Carvedilol in patients with heart failure leads to better outcomes than Metoprolol succinate.
METHODS: This single center retrospective cohort study analyzed a total of 442 patients admitted for systolic heart failure (HFrEF) at Kettering Medical Center between January 1, 2011 and January 30, 2016 and who received either Carvedilol or Metoprolol succinate upon discharge. Outcomes analyzed included the number of heart-failure related readmission within 30 days of initiation of either therapy and number of days to second and third readmissions. Statistical analysis of the data included chi-square tests and ANOVA.
RESULTS: Among 442 patients admitted with systolic heart failure ranging in age from 26-100 years old, 84.8% were 60 years of age or older, 51.3% were male and 39.5% were female. Of these patients, 17% (n =75) were discharged on Metoprolol succinate at dosages ranging from 13-100 miligrams (M = 68.67, SD 58.07) and 83% were discharged on Carvedilol at doses ranging from 6.25 mg to 100 mg per day (M = 21.92, SD = 16.32). For the Carvedilol group, the 30-day readmission rate due to heart failure was 15.8%. The Metoprolol group had a readmission rate of 16.0%. There were no statistically significant differences in the rate of readmissions or days to either the first, second or third heart failure related readmission.
DISCUSSION: Readmissions due to decompensated heart failure represents a substantial burden to our healthcare system. Beta blockers demonstrate a significant and proven benefit in the treatment of patients with chronic heart failure. There are appreciable differences in the physiological effects exerted by each of the beta blockers. Multiple trials have compared readmission rates between the non-selective beta blocker, Carvedilol and the selective beta-1 blocker Metoprolol. There is a tremendous biochemical and physiological evidence which is developing in favor of non-selective beta blockers in patients with chronic heart failure. However there is a considerable amount of debate as to whether there is a specific beta blocker that has superiority over another or if the benefit heart failure patients experience is simply a class effect. Our study demonstrates that in a real-world community setting there was no statistical difference in heart failure related 30-day readmission in patients discharged on either Carvedilol or Metoprolol succinate.

Categories

1st year Fellow: Research

Program Name

KETTERING MEDICAL CENTER

15

Exaggerated Blood Pressure Response and Outcomes in Asymptomatic Executives Undergoing Exercise Treadmill Testing

Haris Riaz, Alaa Alashi, Richard Lang, Raul Seballos, Steven Feinleib, Roxanne Sukol, Leslie Cho, Paul Cremer, Wael Jaber, Brian Griffin, Milind Desai

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Type of submitter

Fellow in Training

Abstract

Introduction
Exaggerated systolic blood pressure response (ESBPR, >220 mm Hg) during exercise treadmill testing (TMT) is associated with incident hypertension. We sought to assess whether EBPR adds incremental prognostic value to Reynolds risk score (RRS, a combination of traditional risk factors and c-reactive protein) and exercise capacity in asymptomatic individuals without documented hypertension.

Methodology
We studied 3401 self-referred, normotensive (excluding documented hypertensives (n=463), asymptomatic subjects patients (mean age 50±7 years, 76% males, 83% Caucasian) presenting for a prospective clinical and TMT evaluation between 1/2005-12/2013. RRS and % age-gender predicted metabolic equivalents (AGP-METs) were calculated. Primary endpoint was a combination of death, non-fatal myocardial infarction and stroke (MACE).

Results
Diabetes mellitus, statin use, smoking history and family history of premature coronary disease were present in 2%, 18%, 13% and 9% subjects, respectively. Mean RRS was 3.2±4. ESBPR was observed in 168 (5%) subjects; 97% had normal Duke TMT score and 78% achieved >100% AGP-METs. At 7.3±3 years, 67 (2%) had MACE [death in 36 (1%)]. On multivariable Cox survival analysis, higher RRS (Hazard ratio or HR 1.13 [95% confidence interval or CI 1.09-1.17]), lower% AGP-METs (HR 1.20 [95% CI 1.06-1.35]) and ESBPR (HR 2.38 [95% CI 1.19-4.38]) were associated with longer-term MACE (all $p<0.05$). Survival curves, separated on ESBPR vs. not, are shown in Figure 1. Findings were similar for longer-term death.

Conclusion
In a low-risk asymptomatic cohort, ESBPR is associated with longer term MACE, independent of exercise capacity and standard risk prediction model.

Categories

2nd year Fellow: Research

Program Name

Cleveland Clinic

38

Inpatient Modified Overnight Vital Sign Monitoring to Assess Improvement in Quiet at Night Scores

Salvatore Savona[1], Deborah Francis[1], Amanda Haberman[2], Candace Hicks[1], Vijay Duggirala[1], Kevin Stiver[3]

[1]Ohio State University, Columbus, USA. [2]Northwestern Medicine, Winfield, USA. [3]Ohio Health, Columbus, USA

Type of submitter

Fellow in Training

Abstract

Background

Standardized 4 hour vital sign monitoring has been utilized since 1893, but the frequency of vital sign monitoring has never been validated to improve outcomes. Additionally, interrupted sleep leads to fractured patient sleep cycles, increased morbidity, and reduced Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) quiet at night scores. Modified Early Warning Score (MEWS) is a validated tool to help identify patients who are at risk for clinical deterioration. Patients with low MEWS scores have reduced rates of clinical deterioration, transfer to higher levels of care, or death. A study published in JAMA in 2013 by Yoder et al at the University of Chicago found that the median MEWS score was 2, yet all patients received the same frequency of vital signs.

Objective

To investigate the effects on HCAHPS quiet at night scores in low-risk hospitalized patients in a modified vital signs check model compared to usual care.

Methods

A 2-month initiative was performed on 4 medical nursing units from January 2nd – March 1st of 2016 in a single tertiary care center. During the first month of the project, patients who had 2 or more vital signs since admission and a MEWS of less than 1 were eligible. In the second month, eligibility was expanded to include patients who had a MEWS of less than 1 in past 24 hours. If the patient wanted to participate, the patient's vital sign checks were changed from every 4 hours to every 8 hours. Nursing was expected to still perform bedside assessments every 2 hours, but did not disturb the patient if they were participating in the intervention. If MEWS score rose above 1 or nursing assessment resulted in concern, the patient's vital sign checks were changed to at least every 4 hours.

Results

592 patients enrolled in the intervention. 133 patients were removed from the study: 125 for abnormal daytime vital signs (resulting in MEWS ≥2), 7 for abnormal evening vital signs (resulting in MEWS ≥2), and 1 for decline in clinical status. When comparing the cohort of patients from the first month to the second month, reason for removal was equally driven by abnormal daytime vitals (p=1). However, there was a statistically significant increase in patients who were removed from the study due to having abnormal vitals when comparing the initial strict inclusion criteria to the more liberal inclusion criteria (15% vs. 28%, p=0.0003). No delays or escalation in care were noted. For all participating nursing units, the composite national percentile for HCAHPS quiet at night score increased by at least 10 percentile points.

Conclusion

Our project suggests that patients with low clinical acuity, as defined by a MEWS of less than 1, may benefit from reduced vital signs monitoring. Due to continued vigilance by bedside nursing, patients continue to receive safe effective care.

Categories

2nd year Fellow: Research

Program Name

Ohio State University

17

Disease-specific quality of life improvements do not predict overall quality of life in older adults following discharge from heart failure hospitalization

Jeremy Slivnick[1], Cara Marolt[2], Joanna Wells[2], Erika Trumble[3], Omar Jimenez[4], Stephen Helmke[4], Mathew Maurer[4], Scott Hummel[2]

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Type of submitter

Fellow in Training

Abstract

Background: Older patients hospitalized for heart failure (HF) often have poor disease-specific quality of life (QOL), but less is known about their general QOL.

Methods: We analyzed data from GOURMET-HF, which randomized older patients to usual care or home-delivered meals following HF hospitalization. Disease-specific QOL was assessed by Kansas City Cardiomyopathy Questionnaire (KCCQ) and general QOL by SF-12 Physical and Mental Health scores. We compared QOL at discharge and 4 weeks using paired t-testing. We defined poor general QOL as SF-12 Physical and Mental scores below age-defined norms at 4 weeks (<40 and <50, respectively). We compared clinical and biomarker variables between patients with normal and impaired general QOL using paired t-testing (table). We validated a previous model to predict post-discharge KCCQ <45 and then evaluated it for poor general QOL (model variables: age, diabetes, stroke, atrial fibrillation, BUN, serum sodium, BNP, and discharge KCCQ).

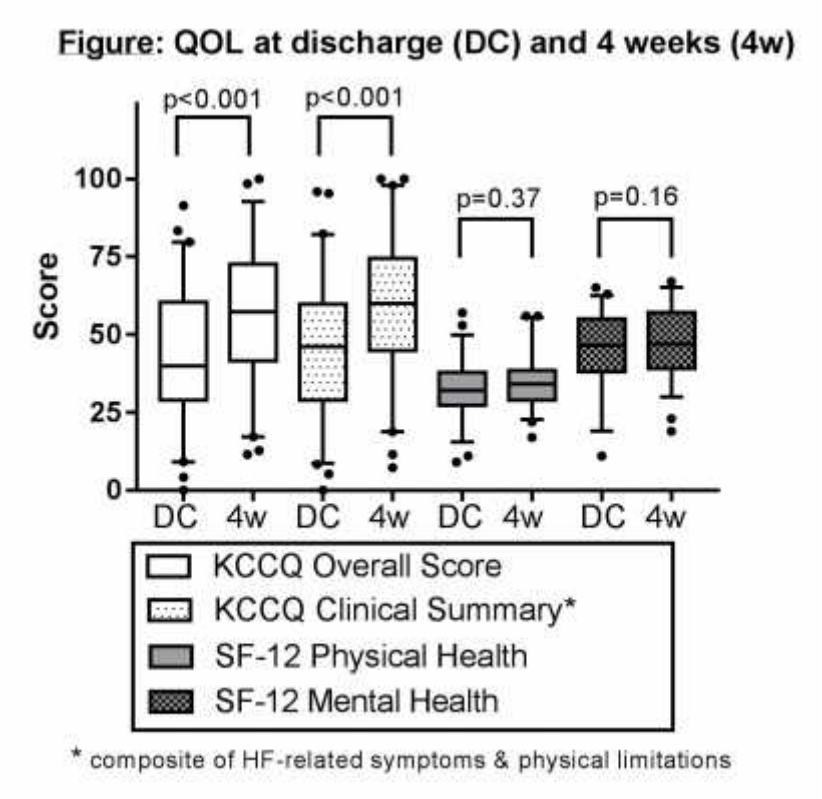
Results: 54 patients (age 70±7, EF 40±19%) had complete QOL data. Overall KCCQ and KCCQ Clinical Summary scores improved at 4 weeks; SF-12 Mental and Physical scores did not significantly change (Figure). At 4 weeks, 15 (28%) patients had KCCQ <45 compared with 23 (43%) with poor general QOL. Compared to patients with SF-12 Physical scores >40, those with scores <40 were prescribed significantly more pre-hospitalization medications and had more comorbidities (Table). There were no significant differences among groups in NYHA class or discharge biomarkers. The EVEREST model predicted KCCQ <45 at 4 weeks (p<0.001, c-statistic 0.79) but not poor general QOL scores, even when comorbidity burden, treatment arm, and change in KCCQ were added.

Conclusions: While disease-specific QOL improves after HF hospitalization, persistently poor general QOL is common. Polypharmacy and comorbidity burden may contribute to this finding. Further research is needed to clarify other non-cardiac factors contributing to poor general QOL in older patients hospitalized with HF.

Table

		SF-12 Physical at 4 weeks	**SF-12 Mental at 4 Weeks**				
		Score ≥40	**Score <40**	**P-value**	**Score ≥50**	**Score <50**	**P-value**
		n=14	**n=40**		**n=23**	**n=31**	
Age (years)	67±7	71±7	0.08	69±6	71±8	0.25	
NYHA Class	**Class I**	1	2	0.08	1	2	0.86
	Class II	9	13		9	13	
	Class	4	20		10	14	

	III Class IV	0	5		3	2
BMI (kg/m^2)	30.3±7	34.5±8	0.08	34.8±8	32.2±8	0.23
Ejection Fraction (%)	27±17	44±18	**0.003**	47±20	34±17	**0.01**
Discharge KCCQ (total)	60±20	42±19	**0.008**	48±19	42±21	0.23
Discharge SF-12: Physical	42±8	30±8	**0.0002**	33±10	34±9	0.83
Discharge SF-12: Mental	48±10	44±13	0.25	49±10	42±13	**0.05**
Number of Comorbidities (Hypertension, Arthritis, Peripheral Vascular Disease, Coronary Artery Disease, Obesity, Osteoporosis, Diabetes, Arrhythmia)	2.5±1.	3.6±1.2	**0.008**	3.3±1.5	3.4±1.2	0.78
Number of Outpatient Meds	5±3	9±6	**0.0008**	9±6	7±5	0.40
Number of Hospitalizations in past 12 months	1.4±0.6	1.8±1.0	0.15	1.7±1	1.6±0.8	0.73
Sodium	136±3	137±3	0.33	138±3	136±3	**0.03**
BUN	26±10	31±13	0.13	28±12	31±13	0.42
Creatinine	1.28±0.3	1.37±0.4	0.40	1.26±0.3	1.40±0.4	0.12
Hemoglobin	12.7±1.4	12.0±1.8	0.17	12.0±1.8	12.2±1.7	0.76
BNP	247 (131-1014)	459 (103-1052)	0.65	459 (93-875)	391 (120-1073)	0.86



Categories

1st year Fellow: Research

Program Name

Ohio State Wexner Medical Center

14

Populations-based Outcomes following Endovascular Interventions and Bypass surgery for lower extremity PAD

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Type of submitter

Fellow in Training

Abstract

Background: Peripheral bypass surgery and endovascular therapy (EVT) are two established treatment strategies to treat symptomatic lower extremity PAD. There is lack of large randomized data to evaluate clinical outcomes with either approach. We studied large scale population-based data about the utilization of either approach and their effect on clinical outcomes.

Methods: We collected data about PAD utilizing the Nationwide Inpatient Sample (NIS) from 2012 to 2014 using ICD-9CM diagnostic and procedure codes. We compared outcomes including in-hospital mortality, major amputation, non-major amputation, gangrene, infection of the lower limb, blood loss requiring transfusion, and stroke with peripheral bypass surgery compared to EVT. Patients aged below 18 years or with sequential revascularization were excluded.

Results: There were a total of 89,256 hospitalizations with 57,428 in EVT and 31,828 in surgical bypass group. The mean age in EVT was 68.6 years and in bypass surgery was 66.2 years (p <0.001). Charlson/Deyo's Comorbidity Index (CCI) ≥3 was seen in 44.7% EVT and 29.6% surgical bypasses (p <0.001). In-hospital mortality was 1.5% in EVT and 2.5% in surgical bypass group (p<0.001). Other outcomes were also noted to be lower with EVT vs. bypass surgery: major amputation (1% vs. 1.3%, p<0.001), non-major amputation (4% vs. 5.5%, p<0.001), gangrene (2.8% vs. 3.2%, p0.005), and acute renal failure (8.9% vs. 11.7, p<0.001). Blood loss requiring transfusion was 11.1% with EVT as compared to 20.6% in bypass surgery (p=<0.001). In EVT, 66.4% patients were discharged home with a median length of hospital stay 3 days. In surgical bypass group 49.2% were sent home and their median length of hospital stay was 5 days (p<0.001 for both). Cost of initial hospitalization was lower in EVT as compared to surgical bypass (25,430$ vs 26271$, p<0.001).

Conclusion: Peripheral bypass surgery had significantly higher in-hospital mortality and complications (amputations, gangrene, infection, acute renal failure, blood loss) as compared to EVT group in this population-based study. In addition, hospital stay, and cost of hospitalization was significantly higher in surgical group as compared to EVT.

Categories

2nd year Fellow: Research

Program Name

Cardiovascular Medicine - University of Toledo Medical Center

39

Postoperative myocardial injury is particularly prognostic toward predicting long-term mortality after non-cardiac surgery in patients classified as low-risk preoperatively.

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MetroHealth/Case Western Reserve University, Cleveland, USA

Type of submitter

Fellow in Training

Abstract

Background: Prior studies have shown an association between postoperative myocardial injury (MINS) and all-cause mortality in non-cardiac surgery patients. However, the role and performance of current pre-operative risk assessments, RCRI and NSQIP, toward predicting post-operative (post-op) troponin elevation and long-term mortality is unknown.

Methods: A retrospective chart review identified 548 patients who underwent non-cardiac surgery that required an overnight hospital stay and had a troponin-I level drawn within 14 days of operation at MetroHealth Medical Center. Inclusion criteria were age between 40-80 years and at least two cardiovascular risk factors. Patients with chest trauma, PE, and neurosurgery were excluded. Patients were determined to have troponin elevation if they had a troponin level of 2 times at or above the upper limit of normal. Individual NSQIP and RCRI pre-operative risk scores were calculated and patients were classified as low or high risk for both tools. Kaplan-Meir survival and odds-ratio with sensitivity/specificity analysis were performed to assess the predictive value of pre-operative risk toward post-op troponin elevation and all-cause mortality at 1-year. We further evaluated the differential prognostic and predictive value of post-op troponin elevation across the pre-operative risk groups toward all-cause mortality at 1-year.

Results: Of the total 548 patients, 39% of patients had troponin elevation post-op with a 1-year all-cause mortality of 16%. Of the total population, those classified as low-risk/high-risk per RCRI was 69% /31% and NSQIP was 66%/34%. Per RCRI, comparing the low-risk vs high-risk groups showed OR: 1.24 (0.85-1.79) with a sensitivity/specificity of 0.33/0.71 toward troponin elevation, and OR: 1.57 (0.97-2.45) with sensitivity/specificity of 0.39/0.71 toward 1-yr mortality. Per NSQIP, comparing the low-risk vs high-risk groups showed OR: 0.62 (0.43-0.9) with sensitivity/specificity of 0.29/0.61 toward troponin elevation, and OR: 1.43 (0.9-2.27) with a sensitivity/specificity of 0.42/0.66 toward 1-yr mortality.

In the total population, elevated troponin portended a 1-yr mortality of OR: 3.9 (2.44-6.33) with a sensitivity/specificity of 0.66/0.67. In the low-risk patients per RCRI, post-op troponin elevation portended a 1-yr mortality risk of OR: 7.6 (3.98-15.22) with sensitivity/specificity of 0.76/0.70. Similarly, in low-risk patients per NSQIP, post-op troponin elevation portended a 1-yr mortality risk of OR: 6.7 (3.4-14.12) with sensitivity/specificity of 0.79/0.64. In patients classified as low-risk by both risk stratification tools, the mortality risk portended by post-op troponin elevation was the highest at OR: 9.6 (4.27-24.38), with sensitivity/specificity of 0.83/0.67.

Conclusion: This work reveals that current pre-operative risk stratification tools, by themselves, may be inadequate toward predicting the risk of post-op troponin elevation and all-cause mortality at 1-year. Interestingly, in patients classified as low-risk pre-operatively, post-op troponin elevation was noted to better predict a markedly higher 1-yr mortality risk compared to the general population. Our results suggest for the first time that post-op troponin elevation, when done in patients classified as low-risk by either RCRI or NSQIP, may better prognosticate their long-term mortality risk and help identify patients who might best benefit from further investigation.

Categories

1st year Fellow: Research

Program Name

MetroHealth/Case Western Reserve University