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Risk Implications of 5 Different Formulas for Renal Function in Patients with STE-ACS

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Background: Antecedent renal insufficiency (RI) is an established predictor of cardiovascular events. Several formulas to estimate glomerular filtration rate (eGFR), as a proxy of renal function, are available, each with its potential strengths and flaws, although their relative implication on outcome among patients with STEACS remains unknown. Given the resources invested in the treatment of STEACS, optimal risk stratification is needed to better allocate them to high-risk patients.
Aim: To assess the risk implications of 5 eGFR formulas among patients admitted with STEACS.
Methods: We examined STEACS patients from 5 consecutive, biennual surveys of acute coronary syndromes in Israel between the years 2002-2010. We compared the implications of 5 different eGFR formulas, based on the initial serum creatinine level, on 1-year mortality: chronic kidney disease epidemiology collaboration (CKD- EPI), modification of diet in renal disease (MDRD), Mayo quadratic (MAYO), Inulin clearance based (IB), and Cockcroft-Gault (CG) formula.
Results: Our cohort included 4220 STEACS patients (79% men, mean age 61.5±13 years), of whom 76.7% received reperfusion therapy. The prevalence of antecedent RI, defined as eGFR<60 ml/minute/1.73m2, varied considerably, yet mortality was higher among RI patients using all formulas (Table). On multivariate analysis, eGFR based on all formulas, except CG and MDRD, was a predictor of 1-year mortality.

	RI -		RI +		P value for 1-yr mortality	HR
	Frequency (%)	1 Year Mortality (%)	Frequency (%)	1 Year Mortality (%)		
CG	80.5	8.9	19.4	9.7	0.51	1.002 (CI 95%1.00-1.005)
MDRD	76.7	4.2	23.3	25.2	<0.001	0.99 (CI 95% 0.98-1.002)
CKD-EPI	74.6	3.8	25.4	24.4	<0.001	0.94 (CI 95% 0.96-0.98)
MAYO	85.8	4.9	14.1	34.4	<0.001	0.97 (CI 95% 0.97-0.98)
IB	74.8	3.6	25.2	24.8	<0.001	0.94 (CI 95% 0.98-1.00)

Conclusion: The prevalence of RI varies considerably among STEACS patients based on the formula used, although for all formulas except CG and possibly MDRD, RI patients fared significantly worse. The CG and MDRD formulas, most commonly used and advocated, may not be the optimal surrogates of outcome among STEACS patients.

COPD Patients with Acute Myocardial Infarction Characteristics and Outcome-ACSIS 2010

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Introduction: Chronic obstructive pulmonary disease (COPD) is common in patients suffer from ischemic heart disease (IHD) and heart failure (CHF). In addition, COPD patients after acute myocardial infarction ST and Non ST (AMI) or PCI and have worsen outcome. The aim of this study was to characterize the differences between patients hospitalized for AMI with and without COPD.
Methodes: Data for patients hospitalized for AMI was obtained from acute coronary syndromes Israeli Surveys (ACSIS) during 2010. Out of these baseline characteristics, management and outcome of 186 COPD patients 70.6±11.8 y old were compared to186 age and sex matched non-COPD patients during the 2 months study period.
Results: Significantly higher proportion of COPD patients had atypical chest pain or dyspnea (14% vs, 5.9% p<.009 and 46.2% vs. 36.6%, p<.05, respectively) as presenting symptome. They had higher proportion of prior AMI and AP and renal failure (45.1% vs, 27.4% p<.0004, 43.2% vs. 34.1%, p<.06 and 24.3% vs. 15.6%, p<.03, respectively). COPD patients have been graded as >killip 1, and higher proportion have been treated by diuretics and nitrates while 5 patients were needed temporary cardiac pacemaker. About 30% of COPD patient discharged with the diagnosis of NSTMI (16.4% vs, 10.4% p<.002) and 15% continued nitrates treatment. Patients with COPD tended to have higher mortality rate after 30 day (9.3% vs. 5.9% p<.22).
Conclusion: COPD patients hospitalized for AMI found to have atypical presentation with higher complication rate with tendency for higher mortality rate after 30 days. Further study with well-defined COPD population for longer follow-up period are needed in order improve the treatment and outcome of COPD patients with AMI.

Drug Eluting Stenting of Bifurcation Lesions: Second Versus First Generation DES

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Background: Recent studies show improved clinical and angiographic results obtained with PCI of de novo coronary artery bifurcation lesions using drug-eluting stenting [DES]. First-generation [DES Gen 1] stents eluting sirolimus or paclitaxel were joined by second-generation [DES Gen 2] stents, such as the everolimus- and the zotarolimus-eluting stents, promising increased safety and efficacy.
Objective: To compare the clinical outcomes between first and second generation DES when treating bifurcation lesions.
Methods & Results: The study included 408 patients. DES Gen 1 included 251 pts [Cypher 78%, Taxus 22%], and DES Gen 2 included 157 pts [Xience, Promus 50%, Endeavor Resolute 39%, Biometrix 11%].
Results: Baseline clinical characteristics were comparable between the two groups.

	DES Gen 1 [n=251]	DES Gen 2 [n=157]	P-value
Two stents technique	43%	47%	0.4
12 month Death	1.6%	1.3%	0.9
12 month MI	0.4%	2.6%	0.6
12 month Definite Stent thrombosis	0.8%	1.3%	0.5
12 month TVR	4.8%	7%	0.1
12 month CABG	2.4%	0%	0.08
12 month MACE	8.8%	8.9%	0.7

Conclusions: During the first year after stent implantation, we didn't find significant differences in clinical outcomes between DES Gen -1 and DES Gen-2 when treating bifurcation lesions and using a systematic approach.

The Effect of Systemic Hypothermia on Myocardial Salvage in Patients with STEMI and Primary PCI

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Introduction: Mild therapeutic hypothermia (MTH) improves survival and neurological outcome in cardiac arrest patients. Preliminary studies showed that hypothermia may be cardio-protective in patients with anterior STEMI undergoing primary PCI. The aim of the present study was to evaluate the effect of MTH on myocardial salvage in patients after out of hospital cardiac arrest (OHCA) with first anterior STEMI.
Methods and Results: The study group consisted of 25 consecutive patients after OHCA due to shockable rhythm with first anterior STEMI who were treated routinely by MTH and primary PCI .The control group consisted of a matched group of patients with anterior STEMI without OHCA .Myocardial salvage was evaluated at hospital discharge by left ventricular ejection fraction (EF) using echocardiography and by clinical signs of congestive heart failure (CHF).The mean EF in the study group was 36%±8.76 compared with a mean EF of 37.8%±9.8 in the control group.The rate CHF was similar in both groups (50%).
Conclusions: In this small group of high risk patients with first anterior STEMI who underwent CPR , PPCI and MTH the myocardial salvage was similar to a matched group of lower risk STEMI patients. We propose a larger national multicenter study to evaluate the beneficial effects of MTH in high risk myocardial infarct patients.

Anemia and Left Atrial Area in Patients with Acute Myocardial Infarction

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Introduction: Both anemia and left atrial area (LAA) are associated with adverse outcome in patients with ST elevation myocardial infarction (STEMI). Anemia is related to background medical comorbidities, and LAA is related to diastolic dysfunction. LAA is the only variable associated with diastolic function that does not change acutely following MI. Here we examine whether or not there is as association between anemia and enlarged LAA in patients with STEM. Such an association might offer another mechanistic explanation for the adverse outcome of patients with anemia and STEMI.

Methods: Patients presented with STEMI and underwent primary PCI were enrolled. Patients with valvular disease were excluded. Serum hemoglobin level was measured on admission, and LAA was measured by echo on day 0-5 (median 1+1.6). Patients were followed prospectively for the occurrence of adverse cardiac events for at least one year.

Results: We recruited 337 consecutive patients aged 62.5±13.1 (range 24-97). Anemia (Hgb <12 gr%) was present in 90 patients (27%). Patients with anemia had larger LAA (20.4 ±4.3 vs 23.1±4.9 P=0.003), higher pulmonary arterial pressure (28.6±6.6 vs .35.4±11.3 P=0.008), with no significant change in ejection fraction (50.5±8.4 versus 48±9.6, p=0.24) suggesting chronic changes. Enlarged left atrium was associated with adverse outcome (OR=3.0, CI 95% 1.2-7.4 p=0.017). Anemia was not significantly associated with MACE (OR=1.8, CI 95% 0.8-4.1 p=0.16). However, combining enlarged LAA and anemia were significantly associated with MACE (OR=3.9, CI 95% 1.3-11.6 p=0.01).

Conclusions: Patients presenting with STEMI and Hb<12.0 have higher incidence of diastolic dysfunction and worse prognosis

Risk Implications of 5 Different Formulas for Renal Function in Patients with NSTE-ACS

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Background: Antecedent renal insufficiency (RI) is an established prognostic predictor of cardiovascular events. Several formulas to estimate glomerular filtration rate (eGFR), as a proxy of renal function, are available, each with its potential strengths and flaws, although their relative implication on long-term outcome among patients with non ST elevation acute coronary syndrome (NSTEACS) remains unknown. Finding the proper prognosticator is important given the high event rates in the first year after NSTEACS.
Aim: To assess the risk implications of 5 eGFR formulas among patients admitted with NSTEACS.
Methods: We examined NSTEACS patients from 5 consecutive, biennial surveys of acute coronary syndromes in Israel between the years 2002-2010. We compared the implications of 5 different eGFR formulas, based on the initial serum creatinine level, on 1-year mortality: chronic kidney disease epidemiology collaboration (CKD- EPI), modification of diet in renal disease (MDRD), Mayo quadratic (MAYO), Inulin clearance based (IB), and Cockcroft-Gault (CG) formula.
Results: Of the 4876 NSTEACS patients (75.8% men, mean age 65.1±12.6 years), 1782 (36.5%) had unstable angina pectoris, and the remaining myocardial infarction. The prevalence of antecedent RI, defined as eGFR<60 ml/minute/1.73m2, varied considerably, yet mortality was higher among RI patients using all formulas except CG (Table). On multivariate analysis, GFR based on all formulas, except CG, was a predictor of 1-year mortality (Table).
Conclusion: Although the prevalence of RI varies considerably among NSTEACS patients based on the formula used, for all formulas except CG, RI patients fared significantly worse. The CG formula, commonly used and advocated, may not be a good surrogate of long-term outcome among NSTEACS patients.

	RI+		RI-		p-value for 1-year mortality	Hazard Ratio (95% CI)
	Frequency %	1-Year Mortality %	Frequency %	1-Year Mortality %		
CKD-EPI	35.2	19.5	64.8	3.8	<0.001	0.97 (0.96-0.98)
MDRD	32.8	20.2	67.2	4.1	<0.001	0.98 (0.97-0.99)
MAYO	22.0	24.5	78.0	5.1	<0.001	0.97 (0.97-0.98)
IB	35.2	19.6	64.8	3.6	<0.001	0.98 (0.97-0.99)
CG	20.0	8.3	80.0	9.8	0.22	1.00 (0.99-1.01)

The Clinical Significance of Conditions Presented by ECG Changes Mimicking Acute MI

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The ECG is of critical importance in the diagnosis of AMI. Clinical conditions such as acute pericarditis, esophageal rupture, subarachnoid hemorrhage, hypothermia and pneumothorax, result in ECG changes that include: ST elevation and T wave inversion.
The purpose of this report is to increase the awareness of those non-coronary syndromes, with ECG abnormalities mimicking AMI, and thus avoiding unjustified intervention procedures or therapy. We present 6 patients with different clinical conditions and with ECG changes mimicking AMI:
A 62 -year old female after epileptic seizures and pathological EEG pattern. The ECG was suggestive of evolving AMI. Troponin I and coronary angiography were normal.
An 18-year old female who suffered acute perimyocarditis, ventricular fibrillation and ECG changes mimicking AMI, while coronary arteries were patent.
A 35-year- old schizophrenic female , who was admitted to CCU with severe hypothermia and shock, bradycardia and ST-T changes mimicking AMI. A 78-year old female with known colon cancer, was admitted six days following 5FU chemotherapy, with ECG changes , but no clinical or biochemical evidence of AMI.
A 57- year old male was admitted after anaphylactic shock following a bee-sting that was treated with Adrenaline and Corticosteroids. The ECG demonstrated a transient ST-elevation in the anterior wall, with no clinical or biochemical evidence of AMI. Cardiac CT demonstrated normal coronary arteries.
A 48-year old female was admitted following a few days of chest pain, after a death in the family. On ECG there was a Q wave in v1-v2. Coronary-arteriography was normal. Left ventriculogram documented apical ballooning, typical of stress-induced cardiomyopathy.
We conclude, that prompt and correct diagnosis based on clinical data and serial ECG is crucial in patients with conditions that may be confused with AMI. Otherwise, these patients are liable to be subjected to unnecessary intervention procedures or therapy.

Endothelial Dysfunction and Platelet Activation Following Acute Ischemic Stroke

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Endothelial dysfunction has been observed in stroke patients. Our aim was clarify whether recent acute ischemic stroke is associated with impaired vascular function and platelet activation. Methods: 43 acute ischemic stroke patients were recruited. All were conscious, and ischemic stroke was defined clinically and by brain CT. Clinical evaluation was done on admission and on day 4. Vascular non-invasive evaluation was done (the brachial artery plethysmography method) within 24 hours of admission. Levels of P-selectin were measured on admission and on day 4. Results: 43 patients (28 men, 15 women) and 42 healthy subjects (30 men, 12 women) were enrolled. Patients were older (62.4±12.5 y vs. 43.5±10.8 y, p=0.001), with worse endothelial function (-4.4±7.4% vs. 15.9±6.8%, p=0.001), higher BMIs (28±6 vs. 25±5, p=0.001). No gender effect was noted in age (60.7±12.8 y vs. 65.7±11.4 y, p=0.19) or FMD% (-5.1±7.8% vs. -2.5±6.6%, p=0.25). Neurological scale (NIHSS) on admission was 4.9±3.4, decreased to 3.2±3.0 after 4 days (p=0.001). Men's NIHSS was 4.8±3.8 on admission, decreased to 3.2±3.4 on the 4th day (p=0.001). Women's NIHSS on admission was 5.0±2.7, decreased to 3.3±2.3 on the 4th day (p=0.001) without gender differences P-selectin levels were high on admission (68.0±55.5 pg/ml), increased to 102.3±72.0 pg/ml on the 4th day (p=0.01). Men had higher P-selectin levels on admission (79.1± 66.7 pg/ml vs. 48.9± 15.4 pg/ml, p=0.02) that further increased to 113.6±82.6 pg/ml (p=0.05); Women's P-selectin increased to 83.5±46.4 pg/ml (p=0.01) without a gender effect on day 4 (p=0.08).
Conclusions: Following acute ischemic stroke patients have severe endothelial dysfunction and increased coagulation activity that suggest risk to develop vascular events.