Early and Late Mortality Among Patients with Renal Dysfunction in Acute Coronary Syndromes

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Disclosure

- None

Background

- Renal Insufficiency (RI) is associated with poor outcome in patients with acute coronary syndrome (ACS)[1].
- Serum creatinine, used in clinical practice as a proxy of renal function, is a relatively poor indicator of RI[2].
- Using eGFR provides a better overall measure of kidney function.
- Several formulas to estimate glomerular filtration rate (eGFR), as a proxy of renal function, are available, although their implication on early and late mortality in patients with ACS remains unknown.

[1]Santopinto JJ *et al*. GRACE Investigators. *HEART* 2003;89:1003-8

[2]Pitsavos C *et al*. *Circ J* 2007; 71: 9-14.

Aim

- To determine the risk implications of the five different formulas for eGFR in a contemporary cohort of "real-world", consecutive ACS patients.

Methods

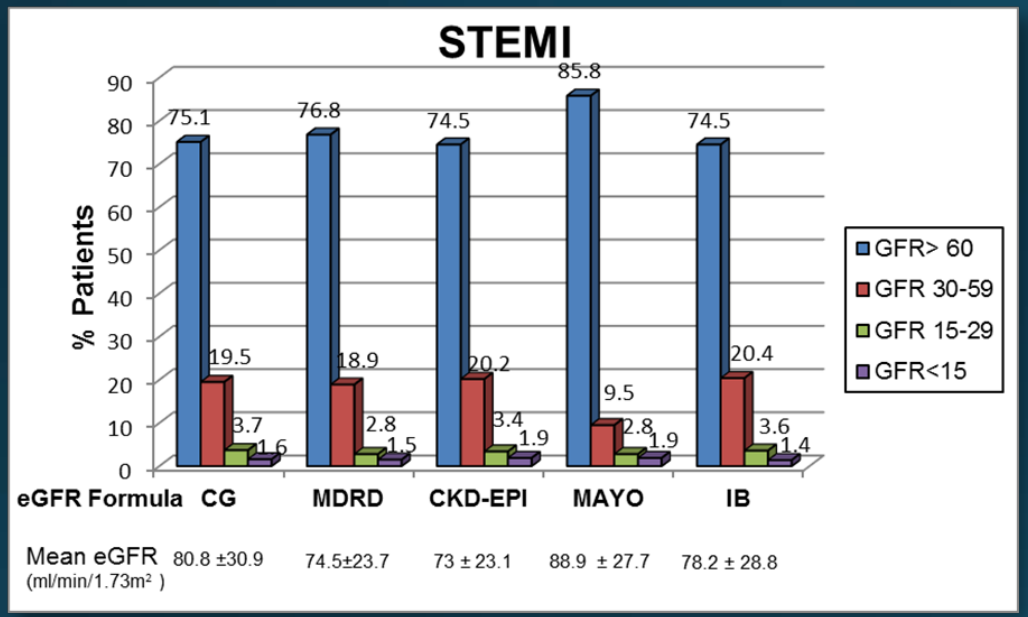
- Data was extracted from the Acute Coronary Syndrome Israeli Survey (ACSIS) between 2002-2010.
- Renal function was assessed using 5 eGFR formulas:
  1. Chronic Kidney Disease Epidemiology Collaboration (CKD- EPI)
  2. Modification of Diet in Renal Disease (MDRD)
  3. The Mayo quadratic formula (MAYO)
  4. Inulin clearance based (IB)
  5. Cockcroft-Gault (CG).
- We compared the implications of 4 stages of RI using the different eGFR formulas on in- hospital and 1-year mortality.
  1. No or Mild RI (GFR≥ 60 ml/min/1.73m^2)
  2. Moderate RI (GFR 30-59 ml/min/1.73m^2)
  3. Severe RI (GFR 15-29 ml/min/1.73m^2)
  4. Very severe RI (GFR<15 ml/min/1.73m^2)

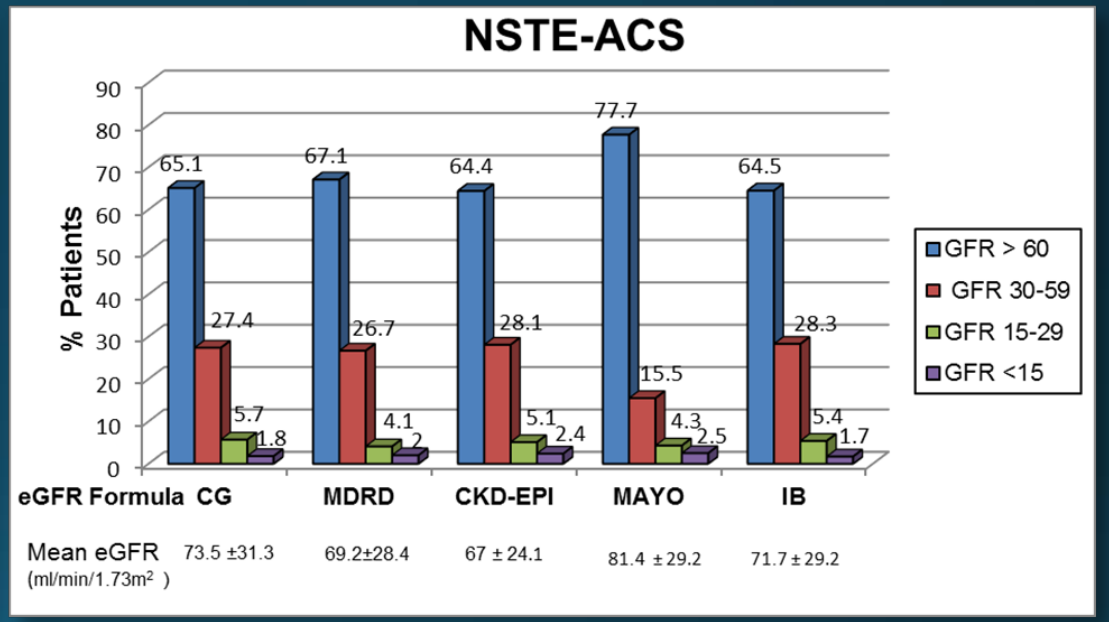
Results

- Baseline Characteristics

	STEMI n=4039	NSTE-ACS n=4687
Male Gender	78.5%	**75.2%**
Age (years)	62.2±12.8	**64±12.7**
Chronic RF	6.3%	**15.4%**
Serum creatinine (mg/dl)	1.17 ±0.7	**1.28 ±0.9**
Hypertension	48.7%	**66.5%**
Diabetes Mellitus	28.3%	**39.1%**
Dyslipidemia	55.4%	**70.7%**
Prior MI	20.2	**37.6**
Prior angina	25.7	**46.3**
Prior PCI	17.3	**35.3**
Prior CABG	4.0	**16.2**
Chronic medications		
Aspirin	33.6	**58.2**
Beta blockers	24.2	**46.4**
ACEI/ARB	25.2	**45.1**
Diuretics	10.7	**23.8**
Statins	29.2	**52.5**

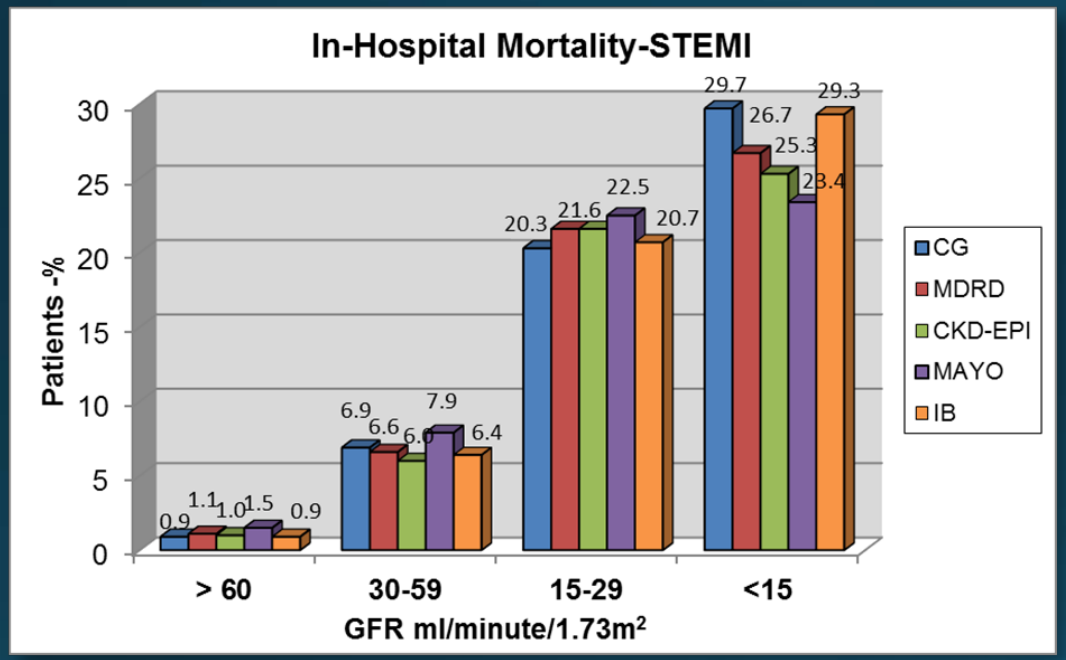
Results

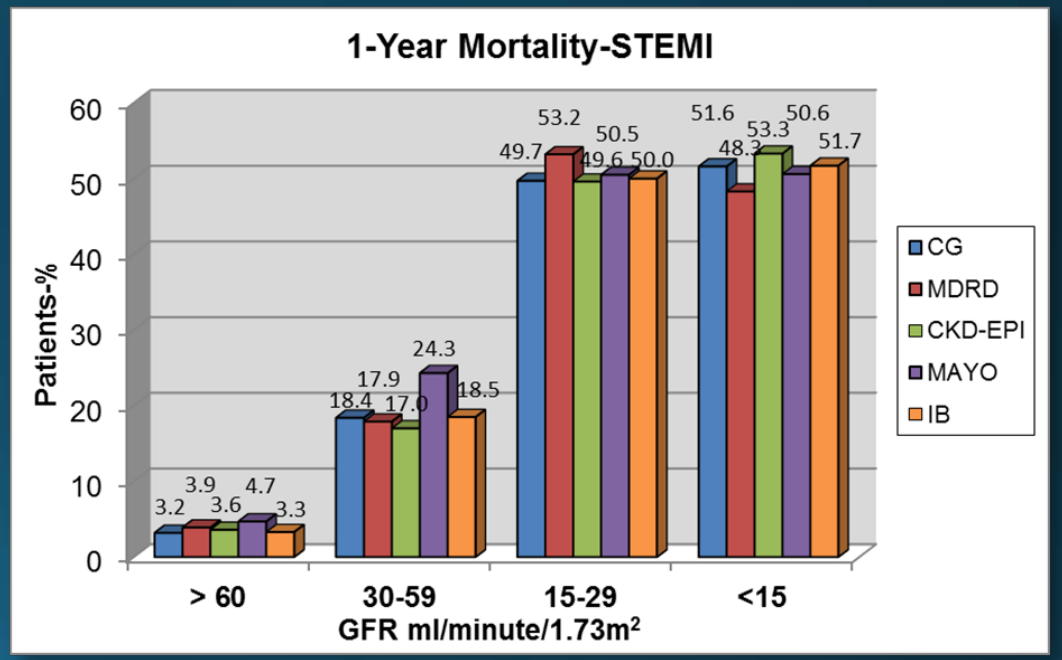




Distribution of STEMI and NSTE-ACS patients based on renal function as determined by eGFR according to 5 different eGFR formulas

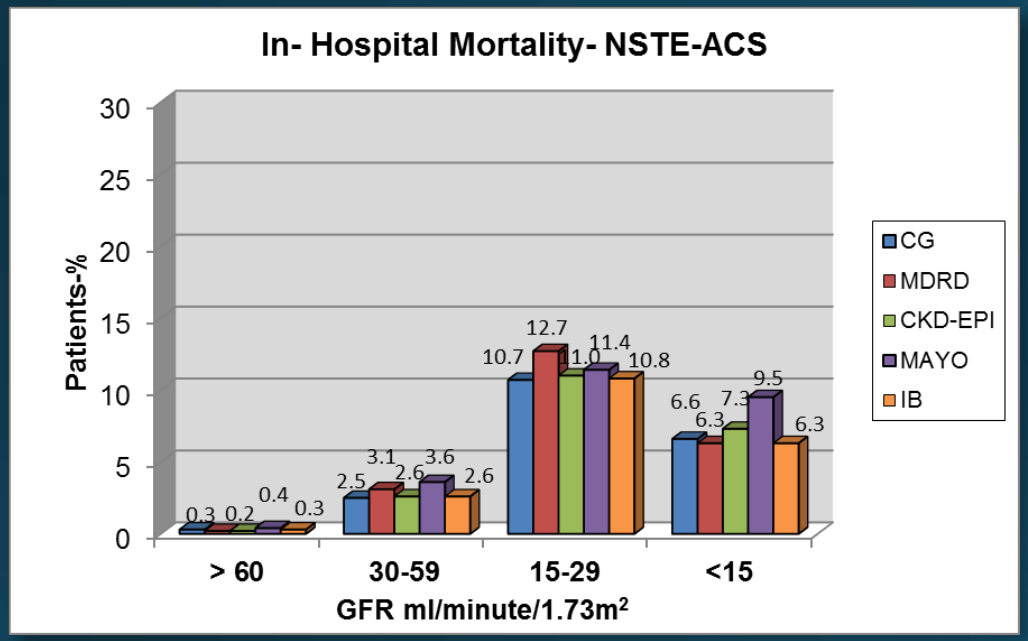
Outcome – Mortality STEMI

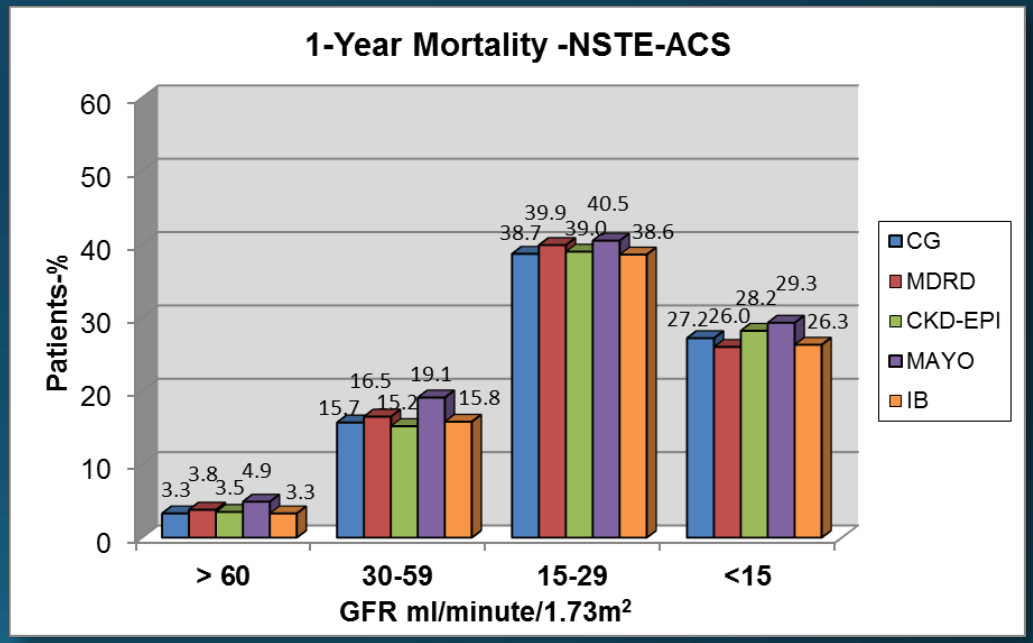




In-hospital and 1-year mortality rates of STEMI patients based on the extent of RI according to 5 different eGFR formulas

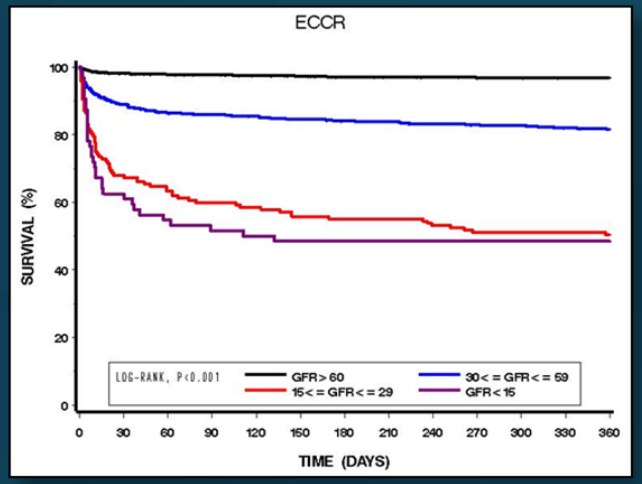
Outcome – Mortality NSTE-ACS

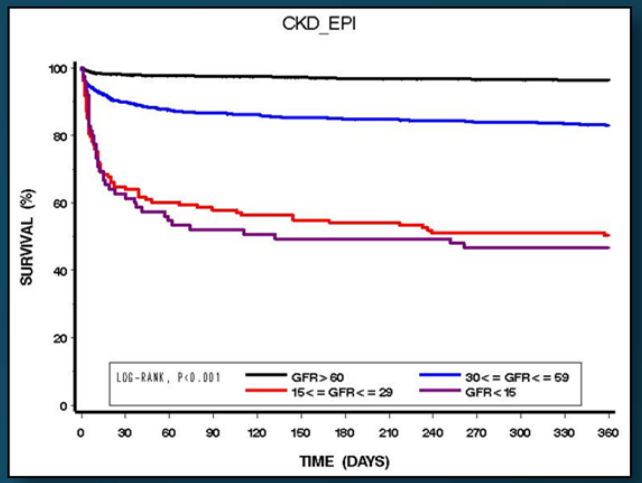


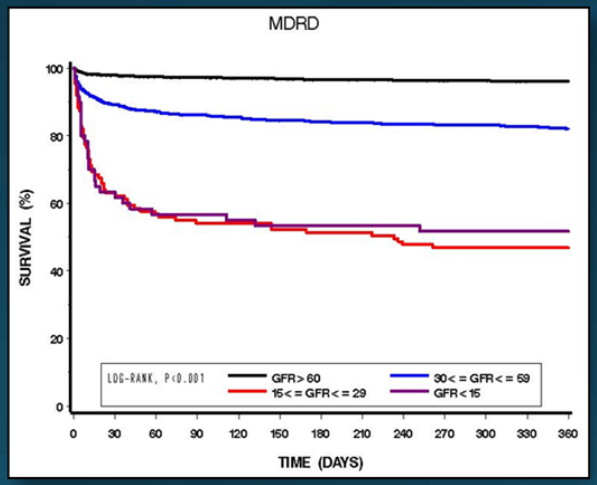


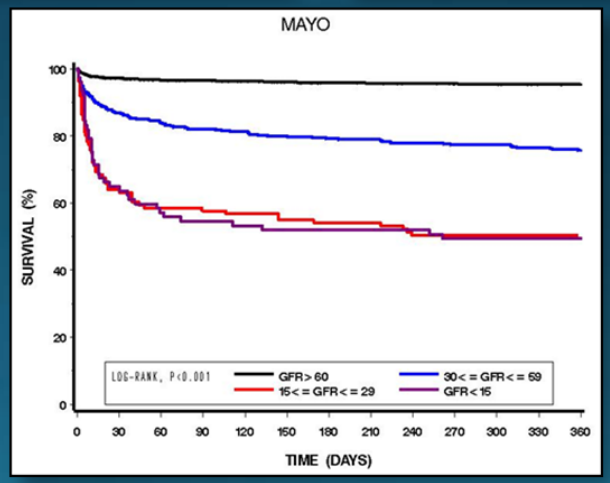
In-hospital and 1-year mortality rates of NSTE-ACS patients based on the extent of RI according to 5 different eGFR formulas

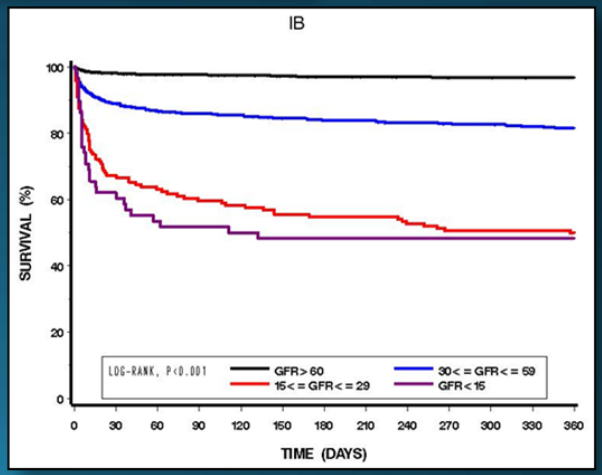
Kaplan-Meier survival curves- STEMI



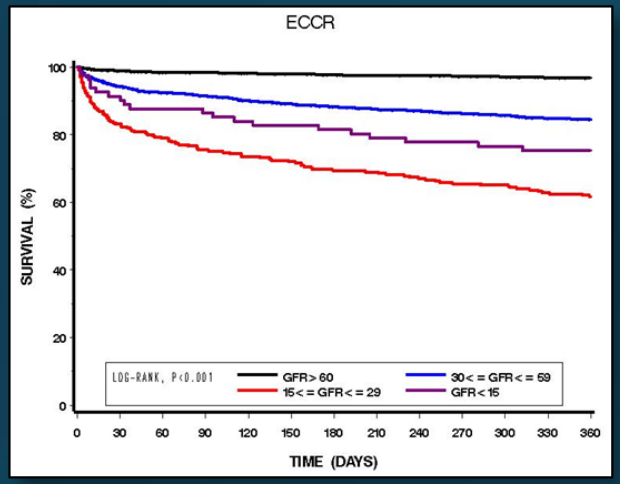


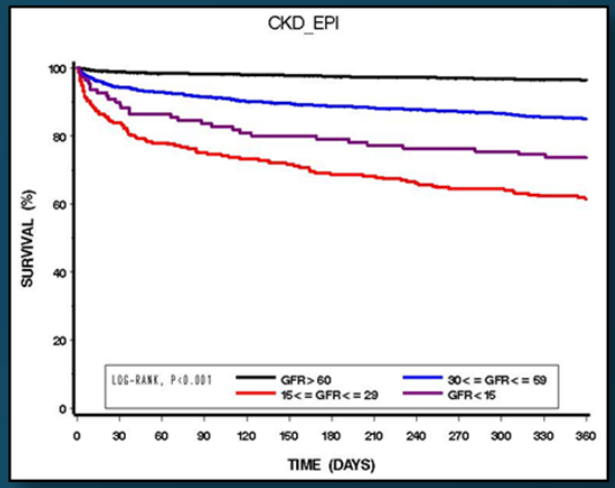


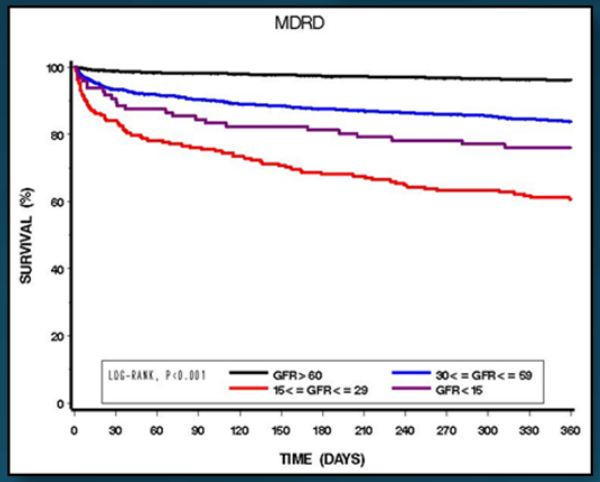


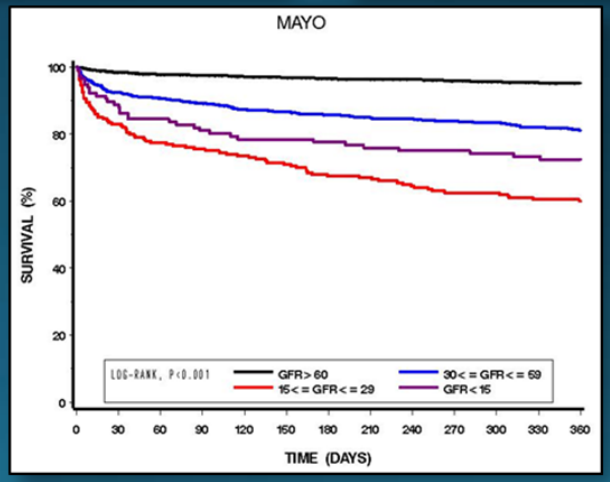


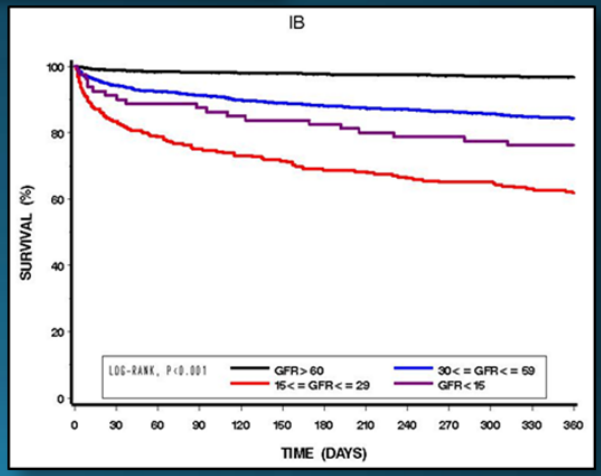
Kaplan-Meier survival curves- NSTE-ACS











Incidence and hazard ratios for 1- year mortality in STEMI and NSTE-ACS patients without or with renal Insufficiency (RI).

STEMI patients			
eGFR formula	1-year mortality (n(%) RI-	1-year mortality (n(%) RI+	Adjusted HR (95% CI)
CG	96 (3.2)	258 (24.9)	1.6 (1.3-2.0)
MDRD	119 (3.9)	235 (24.1)	1.7 (1.4-2.2)
CKD-EPI	106 (3.6)	248 (23.3)	1.8 (1.5-2.3)
MAYO	160 (4.7)	194 (32.7)	1.5 (1.3-1.9)
IB	97 (3.3)	257 (24.3)	1.7 (1.4-2.1)
NSTE-ACS patients			
CG	97 (3.3)	333 (19.8)	1.7 (1.4-2.1)
MDRD	116 (3.8)	314 (19.8)	1.9 (1.5-2.3)
CKD-EPI	104 (3.5)	326 (19.1)	1.8 (1.5-2.3)
MAYO	174 (4.9)	256 (24.0)	1.8(1.5-2.2)
IB	98 (3.3)	332 (19.5)	1.6 (1.3-2.0)

Multivariate analysis

adjusted for age, gender, hypertension, Killip class, dislipidemia, PVD, CRF, prior MI, prior CHF, post VF

Conclusions

- Our study population was unique for its contemporary wide spectrum of ACS patients (including AMI as well as unstable angina patients).
- Renal insufficiency , as assessed by different eGFR formulas, is associated with early and late mortality in patients with STEMI or NSTE-ACS.
- Despite the differences in eGFR values, all formulas may be used for risk stratification in ACS patients.