Renal impairment as a risk factor of cardiovascular events in patients with stable coronary artery disease: the results of 4 years follow-up.

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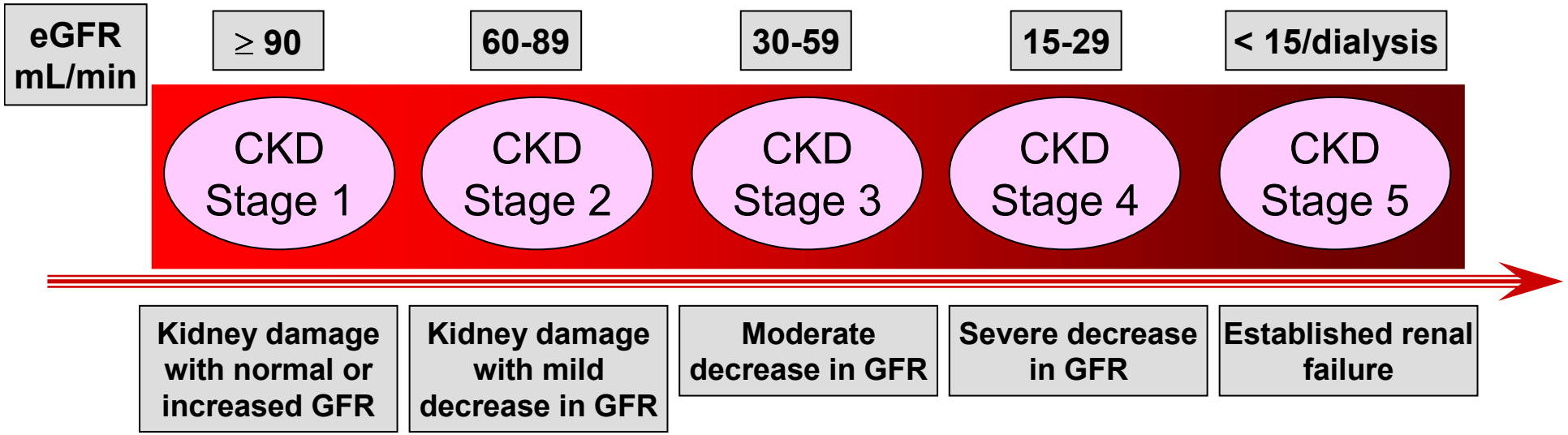
CLASSIFICATION OF CHRONIC KIDNEY DISEASE[1]



- **The prevalence of mild-to-moderate renal dysfunction in general population exceeds 15%[2].**

- **Advanced renal impairment (CKD<60 ml/min) has been shown to be a risk factor of cardiovascular events in hypertensive and diabetic populations as well as in patients with acute coronary syndromes[3,4].**

- **Limited information exists on the risks associated with milder degrees of renal dysfunction in patients with stable coronary artery disease.**

[1] National Kidney Foundation, 2002
[2] N Engl J Med 2004;351:1296-305.
[3] *Ann Intern Med.* 2001;134:629-636.
[4] N Engl J Med 2004;351:1285-95.

AIM OF THE STUDY

- to assess the influence of mild-to-moderate renal impairment on long-term cardiovascular prognosis in patients with stable coronary artery disease

STUDY DESIGN

Inclusion

1. Outpatients aged≥ 45
2. Documented CAD
   - stable angina, Class II – III
   - ACS > 2 months ago
   - PCI/CABG > 2 months ago
3. No apparent kidney disease
4. Therapy:
   - antiplatelets
   - statins,
   - ß-blockers,
   - ACE inhibitors

Risk profile assessment

1. Classic risk factors
2. Cerebrovascular disease (carotid US, CT/MRI if needed)
3. Peripheral arterial disease (US, ABI)
4. Kidney function: Cockcroft–Gault *creatinine clearance* (C_{Cr})

End points

(Vascular events)

follow-up ~48 months

1. Thrombotic events:
   - CV death,
   - nonfatal ACS,
   - stroke/TIA,
   - peripheral arterial thrombosis
2. Revascularization in any affected arterial area

STUDY POPULATION

(risk factors profile)

Classic CV risk factors were common in pts with stable symptomatic CAD

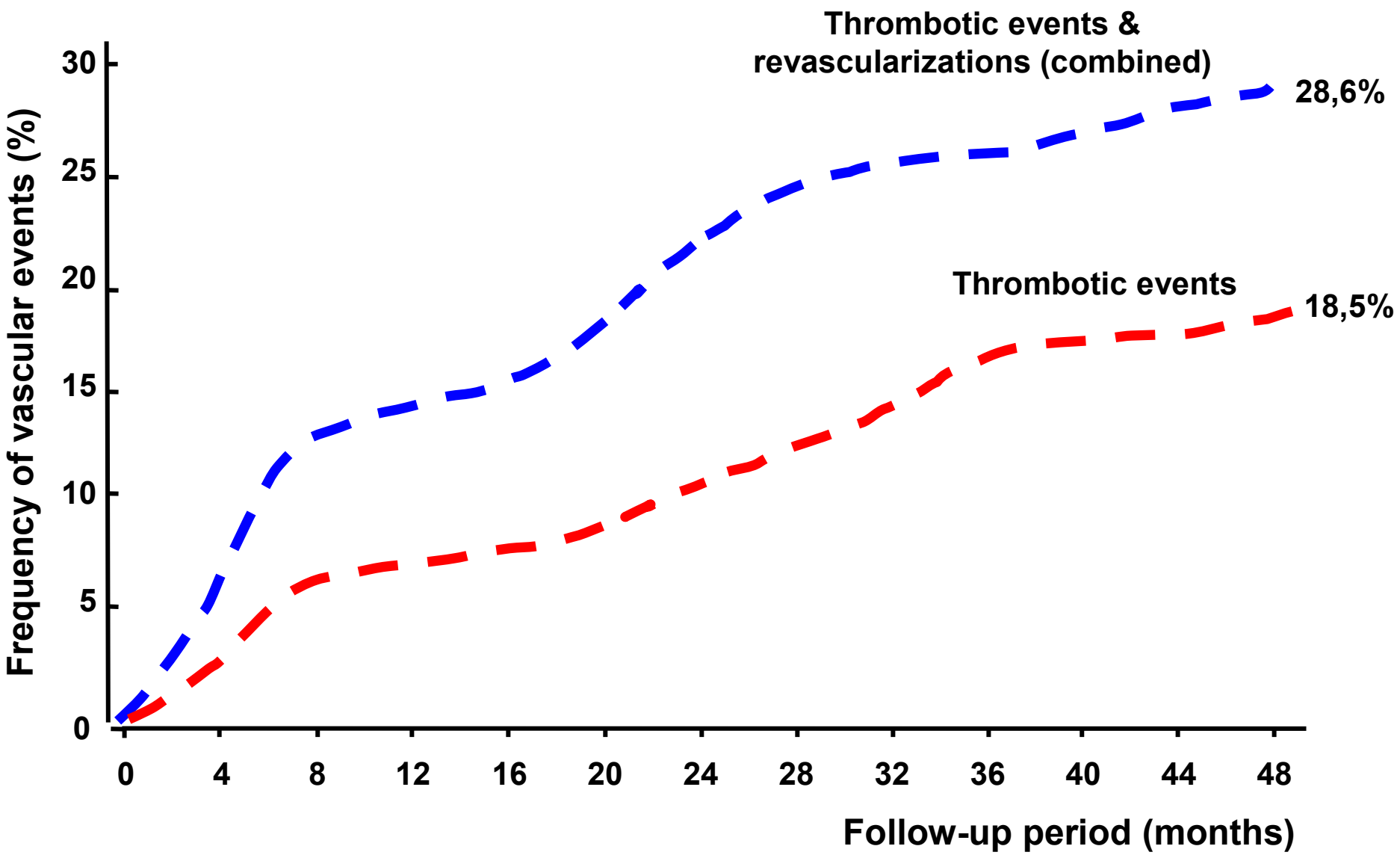
Gender (male/female), n	280 (209/71)
Age, yrs (M±m)	61± 9
Arterial hypertension, n (%)	239 (85,4%)
Hyperlipidemia*, n (%)	217 (77,5%)
Smoking • in history, n (%) • continued, n (%)	 100 (35,7%) 65 (23,3%)
Obesity (BMI> 30 kg/m^2), n (%)	87 (31,1%)
Diabetes mellitus, n (%)	56 (20%)
Atrial fibrillation, n (%)	16 (5,7%)
Serum creatinine, mg/dl (M±m) • Creatinine clearance, ml/min (M±m)	1,1 ± 0,01 85,1 ± 1,49

* Serum cholesterol > 5,2 mmol/l and/or current intake of lipid lowering drugs

STUDY POPULATION
(affected vascular beds)

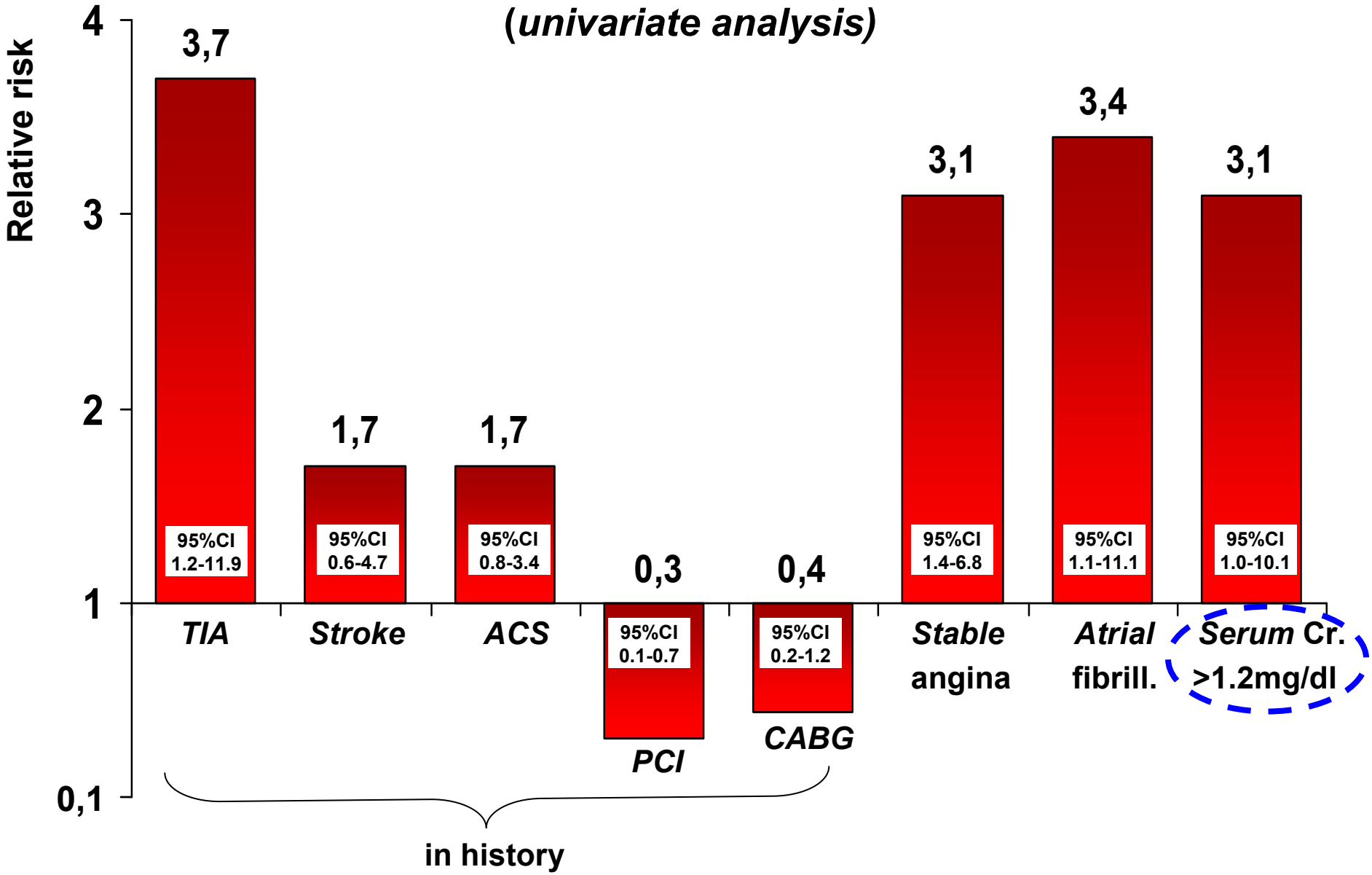
Coronary artery disease (inclusion criteria)	**280 (100%)**
• Stable angina, functional class II – III	181 (64,6%)
• ACS > 2 months ago	169 (60,4%)
• PCI / CABG > 2 months ago	166 (59,3%)
Coexisting with cerebrovascular disease (CVD)	**64 (22,9%)**
• Ischemic stroke / TIA > 2 months ago	34 (13,2%)
• Carotid artery stenosis > 50%	37 (12,1%)
• Carotid surgery/angioplasty > 2 months ago	10 (3,6%)
Coexisting with peripheral arterial disease (PAD)	**51 (18,2%)**
• ABI <0,9	50 (17,9%)
• Intermittent claudication, Fontaine stage II-III	31 (11,1%)
• History of lower limb amputation	1 (0,35%)
• Peripheral surgery / angioplasty > 2 months ago	4 (1,4%)

FOUR-YEARS EVENT CURVES

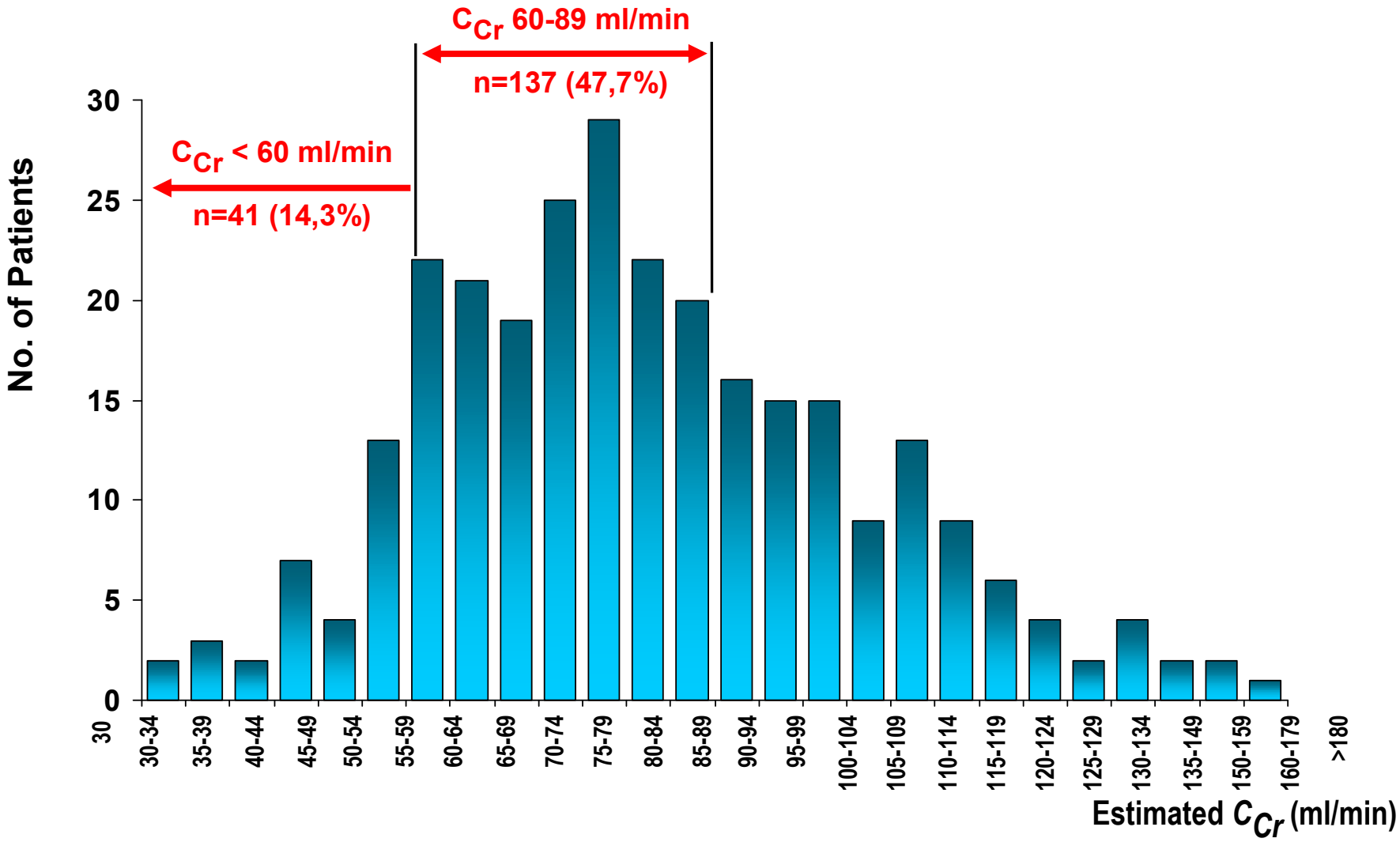


CLINICAL AND LABORATORY VARIABLES AND RISK OF VASCULAR EVENTS

(*univariate analysis)*

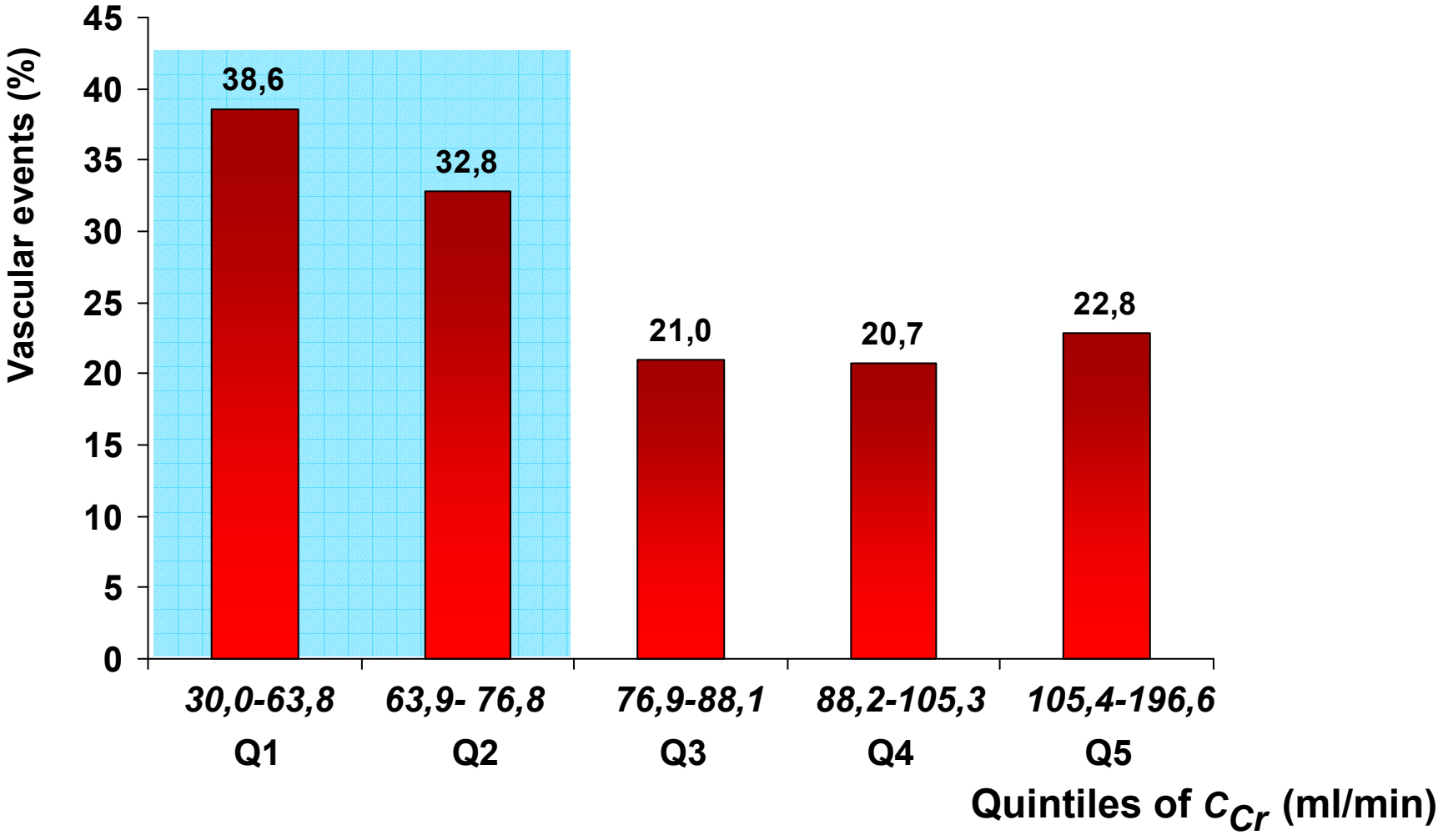


DISTRIBUTION OF ESTIMATED CREATININE CLEARANCE



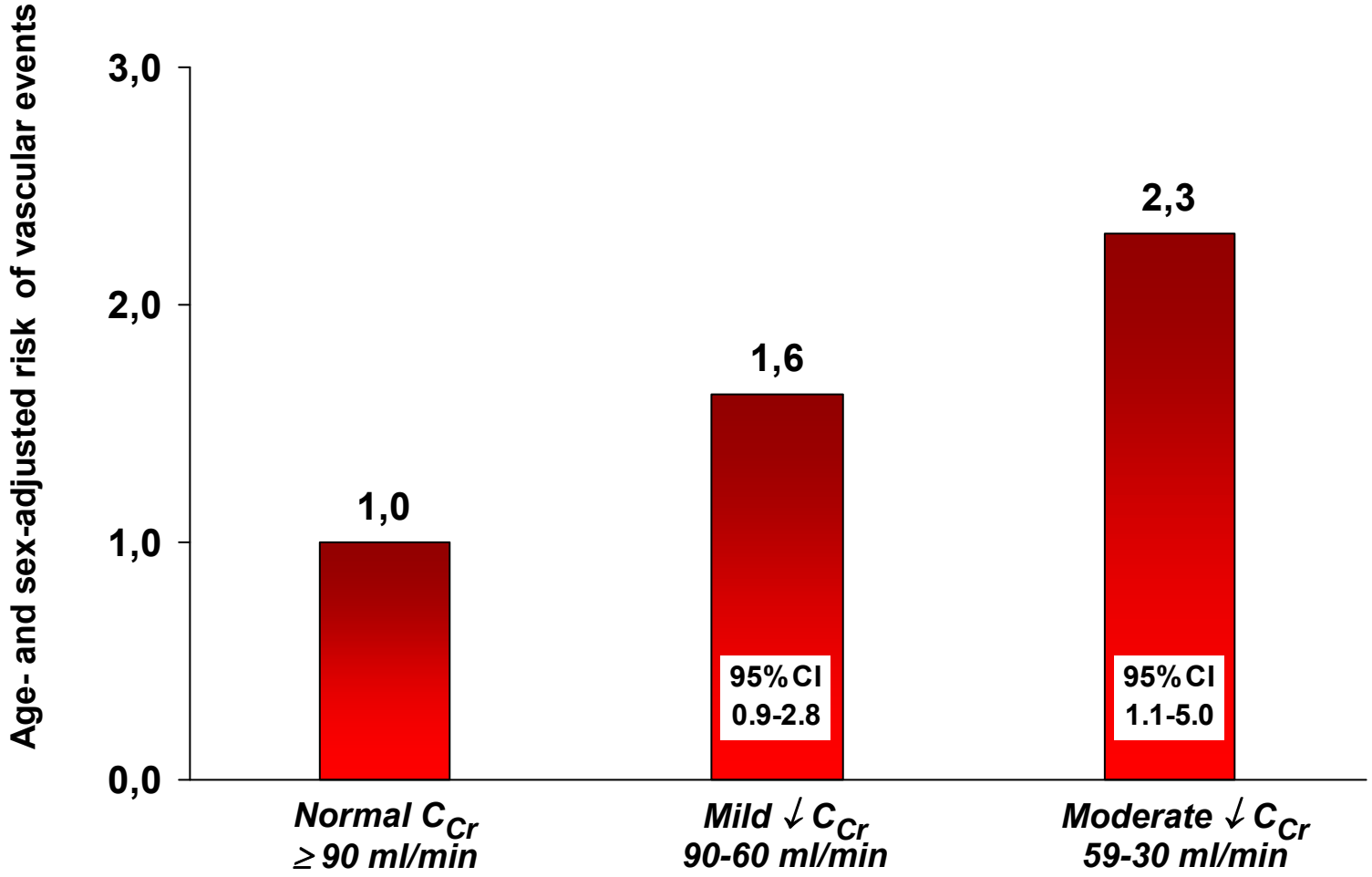
More than one half (62%) of patients with CAD met the estimated C_{Cr} criteria for CKD. Mild renal impairment revealed in 137 (47.7%) and moderate in 41 (14.3%) of patients included.

INCIDENCE OF VASCULAR EVENTS ACCORDING TO THE QUINTILES OF ESTIMATED CREATININE CLEARANCE



Vascular events were observed more frequently in two lower quintiles of C_{Cr} distribution

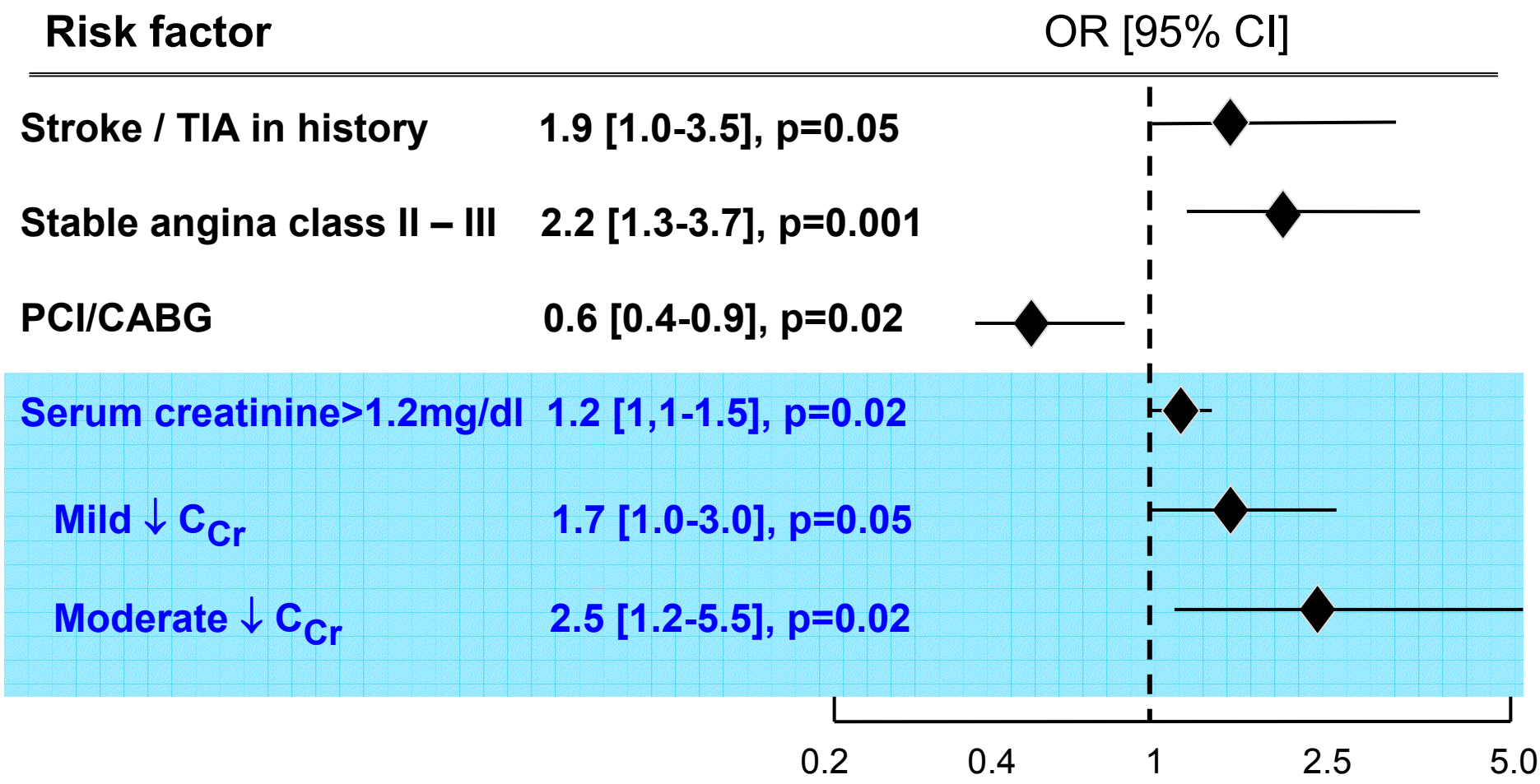
RISK OF VASCULAR EVENTS ACCORDING TO THE STAGE OF RENAL IMPAIRMENT



The risk of vascular events increased with declining C_{Cr} below 90 ml/min

PREDICTORS OF VASULAR EVENTS

(Cox proportional hazards model)



CONCLUSION

- More than 60% of patients with stable CAD had reduced C_{Cr} (<90 ml/min) in the absence of any apparent kidney disease.
- Moderate renal impairment independently increased risk of vascular events (OR 2,5; 95%CI 1,2-5,5) in patients with stable CAD.
- Even mild renal impairment was associated with increased risk of vascular events in patients with stable CAD.