



# PREVALENCE AND PREDICTORS OF RENAL ARTERY STENOSIS IN CORONARY ARTERY DISEASE PATIENTS

R. Ollivier, D. Boulmier, G. Laurent, S. Mock,  
M. Bedossa, H. Le Breton

University Hospital, Rennes, France

# BACKGROUND

- Renal artery stenosis prevalence
  - in general population: unknown
  - in small selected series: 12 to 53 %
  - in very large autopsic study: 4 %
  
- Independant predictor of cardio-vascular or all-cause mortality (Conlon et al. , *J Am Soc Nephrol.* 1998, *Kidney Int.* 2001), (De Silva et al. , *Am J Cardiol* 2007)

# AIMS

1. Estimate RAS prevalence in coronary artery disease patients and define predictive factors
2. Evaluate risks for renal angiography at the time of coronary angiography

# METHOD

- Prospective study
- Systematic selective renal angiography in patients with proven CAD
- Clinical history, cardiovascular risk factors, renal function, and coronary disease extent entered into a predictive statistical model
- Renal artery stenosis  $> 50\%$  considered significant
- Prevention of contrast nephropathy

# STUDY POPULATION (N=650)

Mean age +/- SD	<b>67 y.o. +/- 10</b>
Male gender	<b>80 % (513)</b>
History of hypertension	<b>65 % (423)</b>
Dyslipidemia	<b>75 % (486)</b>
Smoking	<b>59 % (383)</b>
Diabetes	<b>24 % (158)</b>
Peripheral vascular disease	<b>19 % (125)</b>
Prior myocardial infarction	<b>25 % (161)</b>
Prior stroke	<b>2 % (11)</b>
History of renal dysfunction	<b>15 % (101)</b>

# PREVALENCE

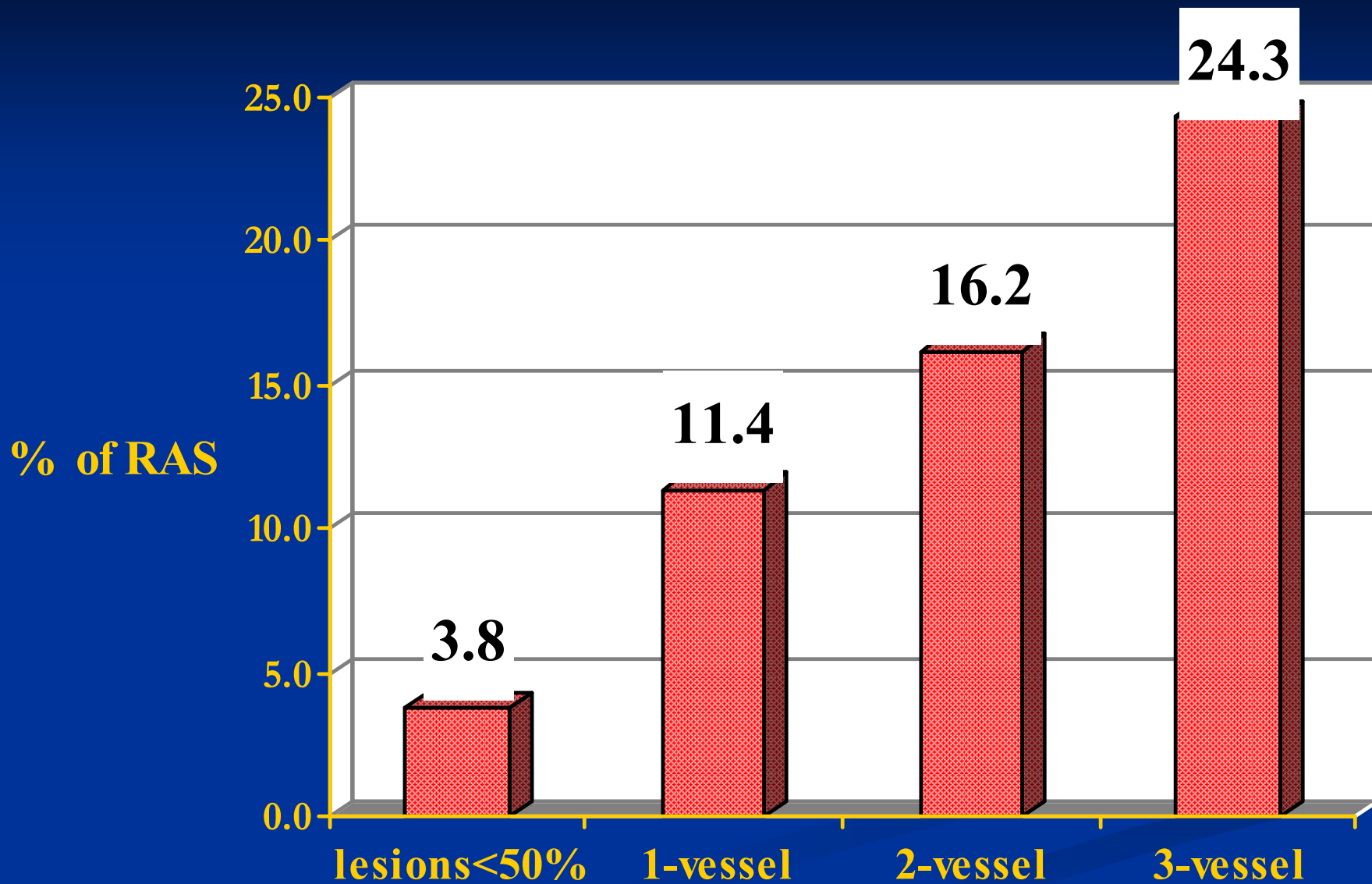
- Prevalence : **14.5 %** , 95% CI [11.8%-17.2%]

	<b>N</b>	<b>%</b>
<b>Unilateral RAS</b>	<b>74 / 650</b>	<b>11.4 %</b>
<b>Bilateral RAS</b>	<b>20 / 650</b>	<b>3.1 %</b>
<b>Total</b>	<b>94 / 650</b>	<b>14.5 %</b>

# UNIVARIATE ANALYSIS

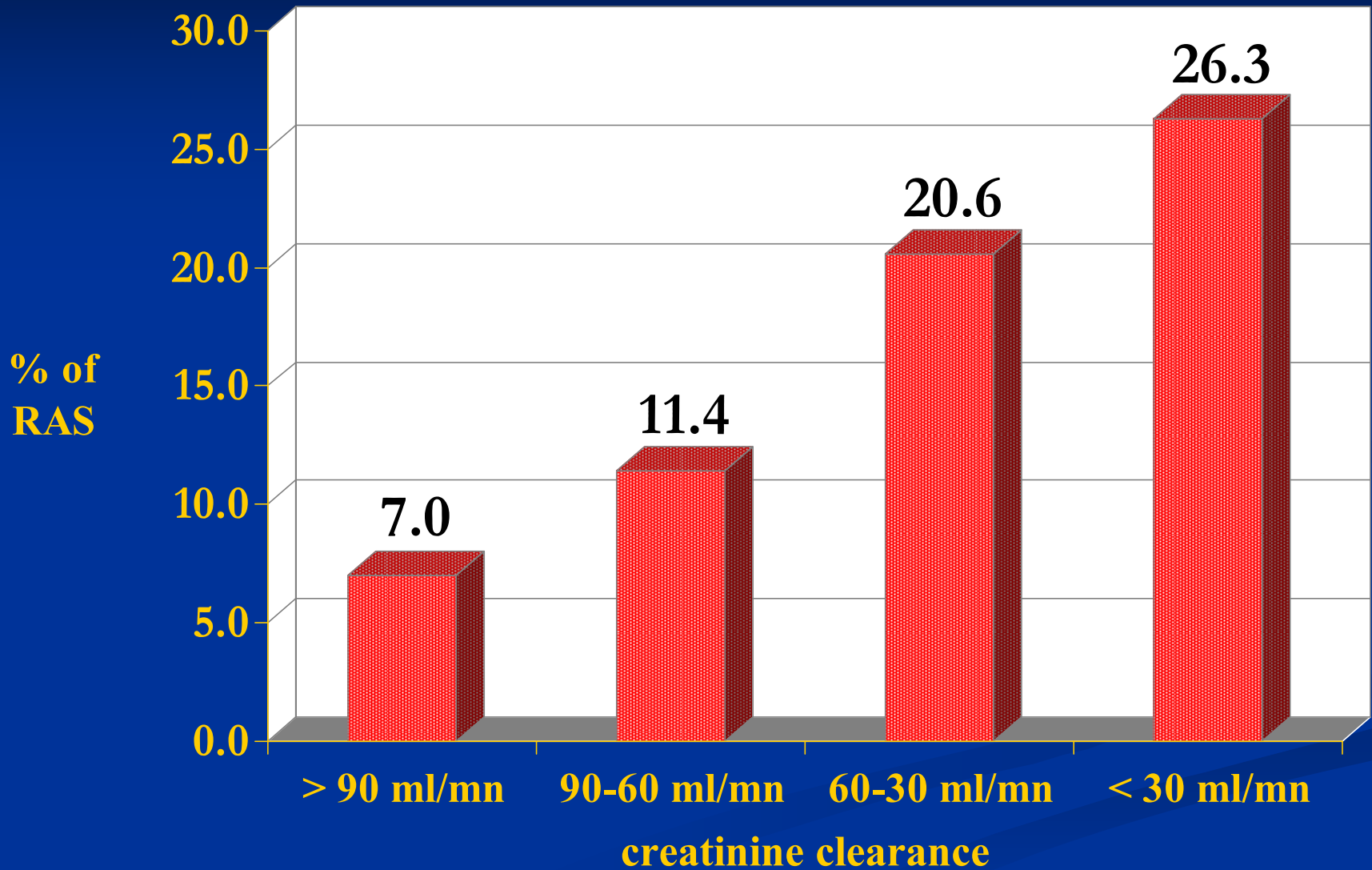
<b>RAS</b>	<b>YES (n=94)</b>	<b>NO (n=556)</b>	<b>p</b>
<b>History of hypertension</b>	<b>83% (78)</b>	<b>62% (345)</b>	<b>&lt; .001</b>
<b>≥ Single-vessel</b>	<b>96% (90)</b>	<b>82% (454)</b>	<b>.001</b>
<b>≥ Two-vessel</b>	<b>79% (74)</b>	<b>54% (302)</b>	<b>&lt; .001</b>
<b>Three-vessel</b>	<b>55% (52)</b>	<b>35% (197)</b>	<b>&lt; .001</b>
<b>History of renal disease</b>	<b>32% (30)</b>	<b>13% (71)</b>	<b>&lt; .001</b>
<b>Creatinine clearance &lt; 90 ml/mn</b>	<b>93% (87)</b>	<b>83% (463)</b>	<b>.02</b>

# Proportion of RAS according to CAD extent

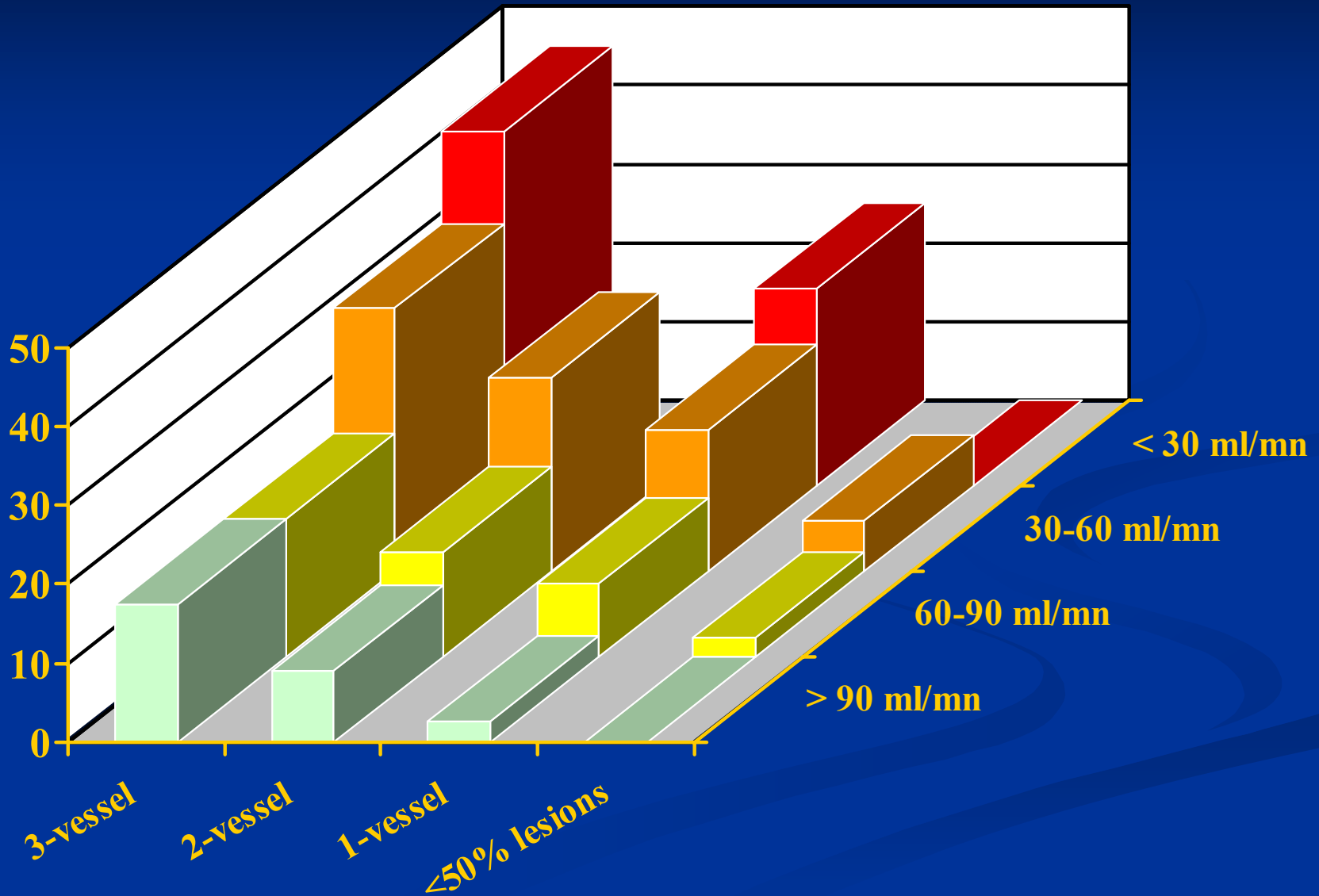




# Proportion of RAS according to renal function



# Proportion of RAS according to both renal function and CAD extent



# MULTIVARIATE ANALYSIS

- History of hypertension ( $p = .001$ )
- Coronary disease extent ( $p < .01$ )
- Renal dysfunction ( $p < .001$ )
- Male gender ( $p < .05$ )

# Non predictive factors

- Peripheral vascular disease
- Cardiovascular risk-factors (except hypertension)
- Blood pressure recorded during catheterization
- High or low BMI
- Prior myocardial infarction or stroke
- Left ventricular dysfunction
- Aortic stenosis

# Adverse events

- None serious adverse event
- RAS patients : no significant change in renal function
- Patients without RAS : moderate and transient increase of creatinine

	<b>Creatinine pre-cath. (ml/mn)</b>	<b>Creatinine post-cath. (ml/mn)</b>	<b>p</b>
<b>RAS</b>	<b>116 +/- 40</b>	<b>110 +/- 33</b>	<b>ns</b>
<b>No RAS</b>	<b>100 +/- 36</b>	<b>124 +/- 77</b>	<b>&lt; .05</b>

# Comparison to cardiac catheterization without renal angiography

	<b>Coronary angio. without renal angiography</b>	<b>Coronary angio. with renal angiography</b>	<b>p</b>
<b>N=</b>	<b>460</b>	<b>409</b>	
<b>Catheterization duration (min)</b>	<b>25.2 +/- 14</b>	<b>25.3 +/- 13</b>	<i>ns</i>
<b>X-Ray duration (min)</b>	<b>6.7 +/- 8</b>	<b>6.8 +/- 5</b>	<i>ns</i>
<b>Volume of contrast (ml)</b>	<b>133 +/- 53</b>	<b>165 +/- 58</b>	<b>&lt; .05</b>

# Study limitations

- Selected population: coronary disease patients
- Exclusive femoral approach
- Details about history of hypertension were not recorded

# CONCLUSION

- Main predictive factors: history of hypertension, renal dysfunction, coronary disease extent.
- Good feasibility and acceptable risks

- Benefit of systematic screening ??
- Are screened patients good candidates to revascularization ??





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