DES en el Infarto Agudo de Miocardio

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DES en el Infarto Agudo de Miocardio

La angioplastia primaria se ha vuelto el tratamiento de elección en IAM con elevación del ST

La incidencia de la re estenosis intra stent no medicado (BMS) en los pacientes con IAM con ST, no es despreciable con sobre costos relacionados a re hospitalización y nuevos procedimientos

La utilización de DES reduce la proliferación intimal con resultados clínicos y angiográficos mejores a corto y largo plazo en comparación con los BMS

DES en el Infarto Agudo de Miocardio

La utilización “off label” en el IAM se extendió en la practica medica

La utilización de DES en el IAM es controvertida

Los datos obtenidos de registros proveen buenos números con respecto a la eficacia y la seguridad a largo plazo de los DES utilizados en el IAM

Pero existen cuestiones : sesgo en la selección de pacientes, estudios con poca población de pacientes y la trombosis tardía y muy tardía de stents

DES en el Infarto Agudo de Miocardio

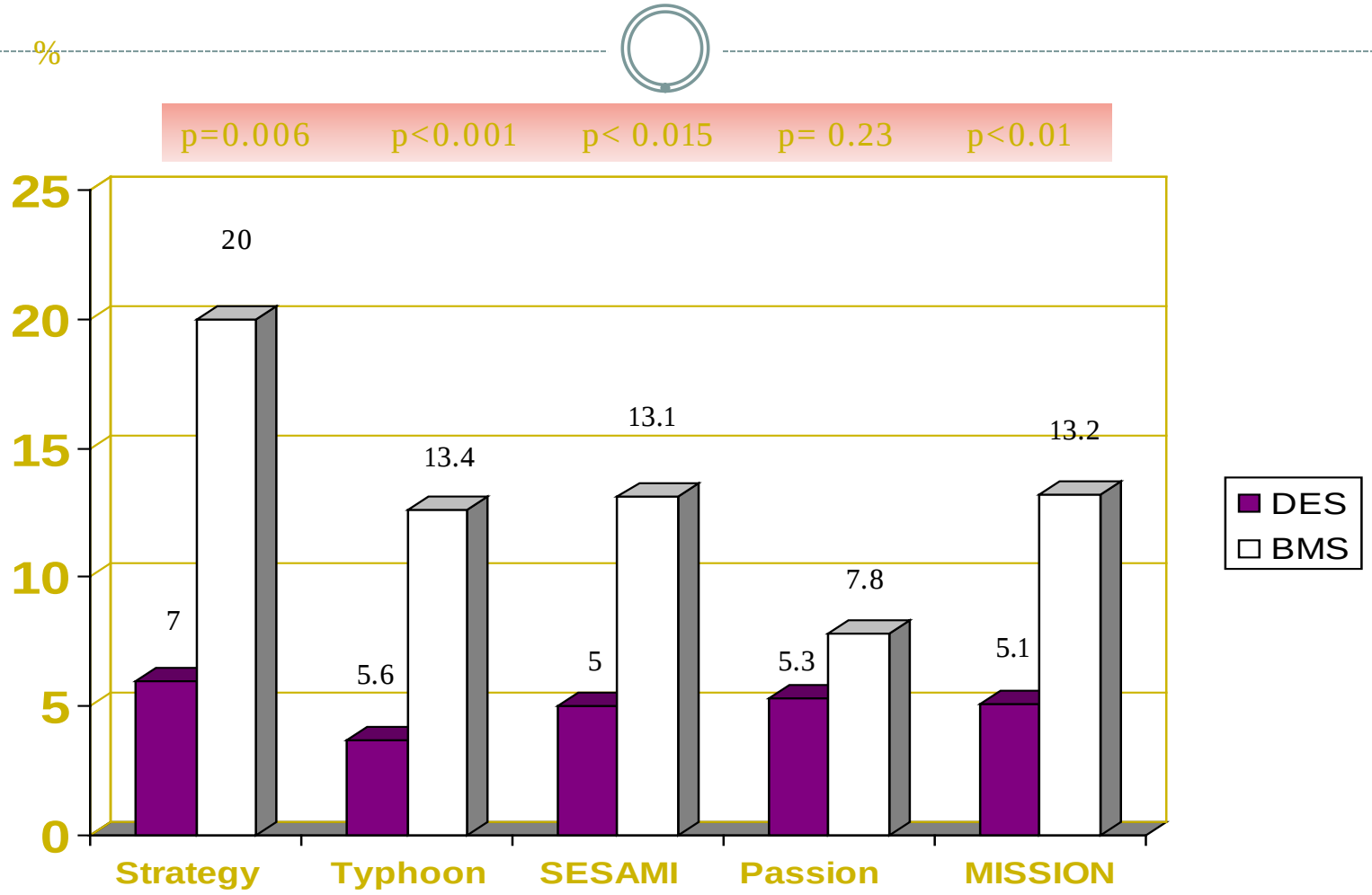
Estudios randomizados y meta-análisis han aportado datos mas robustos sobre la superioridad del DES >BMS

- Reducción en el TVR en pacientes con IAM

Pero en estos estudios iniciales

- la población estudiada no fue grande
- no dieron respuesta sobre la trombosis tardía y muy tardía del stent.
- Limitados a 12 meses de seguimiento solamente

DES in AMI: 1-year TVR



TYPHOON Trial

- Evaluación del tratamiento con stent medicado con Sirolimus comparado con stent convencional en pacientes con IAM sometidos a PTCA primaria

- Hasta ese momento varios estudios randomizados habían sido realizados comparando la PTCA electiva con stents medicados vs stents no medicados

Presented at ACC 2006

TYPHOON Trial

712 patients with acute MI (prolonged chest pain with ST segment elevation) < 12 hours since onset, culprit lesion in a native suitable for stenting

Randomized, 22% female, mean age 59 years, mean follow-up 1 year
71% received Glycoprotien llb/llla inhibitors, Door to balloon time=60 minutes

Cardiac catheterization/primary PCI

Cypher Stent Sirolimus-eluting n=355

Bare-metal stent (any kind) n=357

Concomitant Medications:
- Aspirin (≥100mg)
- Clopidogrel (300mg load and 75 mg/day for 6 months)

- Primary Endpoint: Target vessel failure at one year, defined as target vessel revascularization, recurrent MI or cardiac death.
- Secondary Endpoint: In- hospital, 1, 6 & 12 months major adverse cardiac event

Presented at ACC 2006

TYPHOON: Resultados Clínicos (un año) y angiograficos (ocho meses)

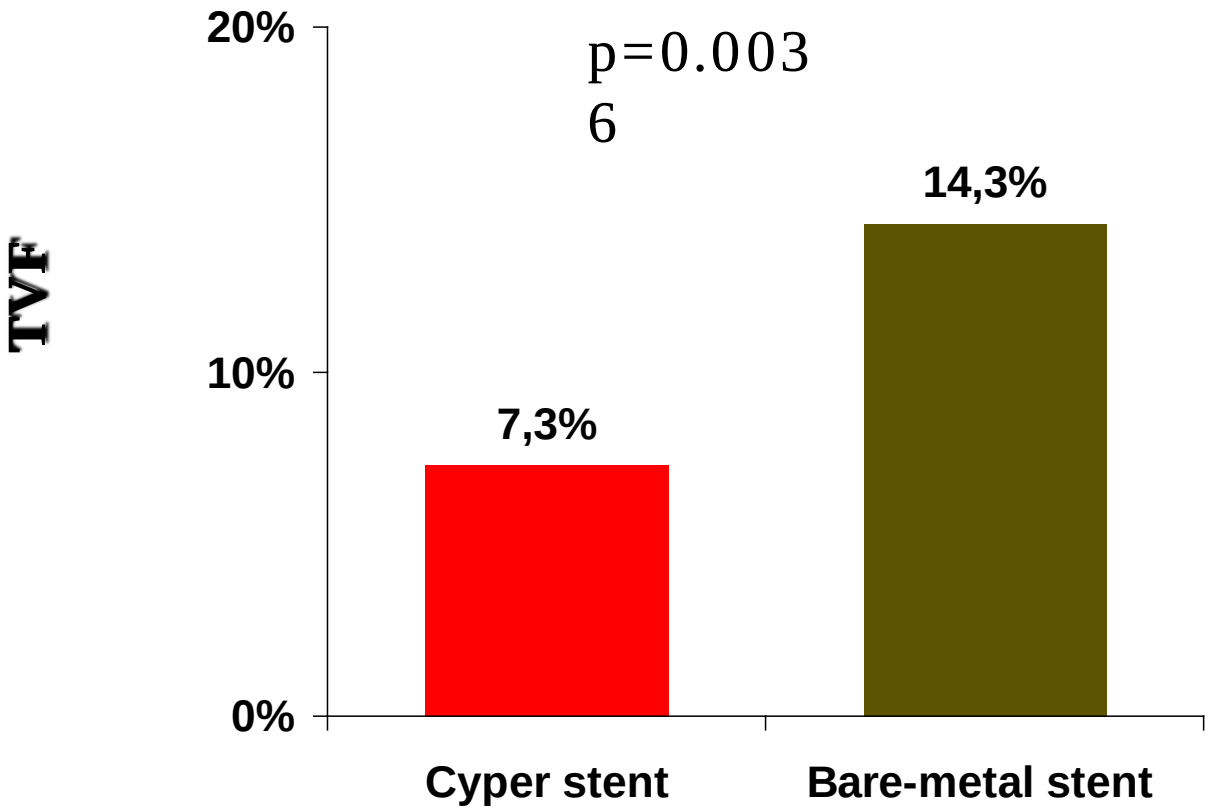
End point	Cypher	Bare-metal stent	p
Target vessel failure* (%)	7.3	14.3	<0.004
Clinically driven target vessel revascularization (%)	5.6	13.4	<0.001
Cardiac death	2.3	2.2	1.00
Recurrent MI	1.1	1.4	1.00
Stent thrombosis	3.4	3.6	1.00
Binary restenosis, in-lesion (%)	7.1	20.3	0.02
Late luminal in-lesion loss (mm)	0.17	0.56	<0.001
% diameter in-lesion stenosis	24.6	37.9	<0.001

*A composite of TVR, MI, target vessel-related death

Spaulding C et al. *N Engl J Med* 2006; 355:1093-1104.

TYPHOON Trial: Primary Endpoint(s)

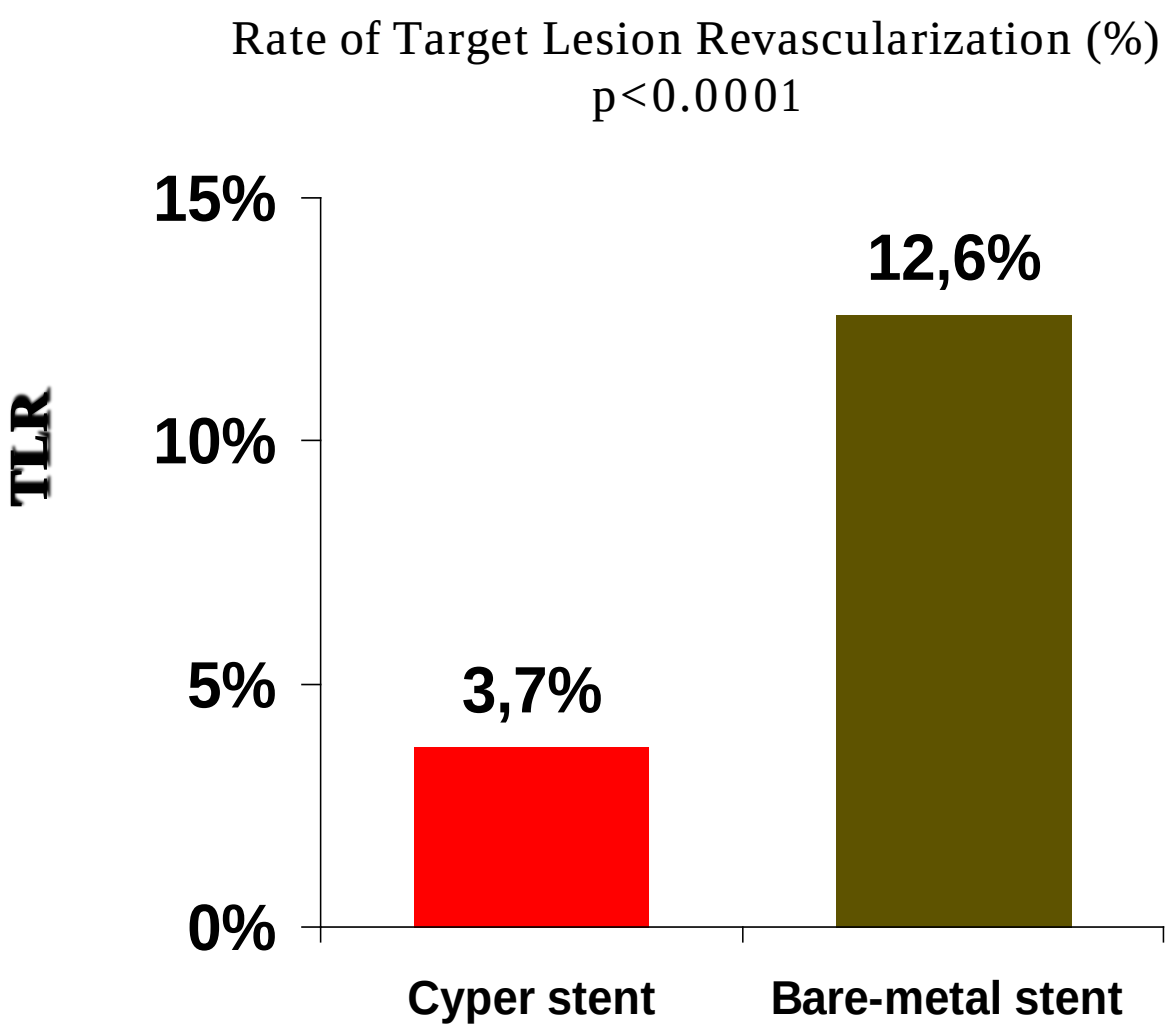
Target Vessel Failure* at one year



- **Target vessel Failure (TVF) fue menor en el grupo de stent Cypher comparado con el grupo de stent convencional (7.3% vs 14.3%; p=0.0036) sin diferencia en la mortadlidad ni IM**

***a composite of TVR, MI, cardiac death**

TYPHOON Trial: Target Lesion Revascularization

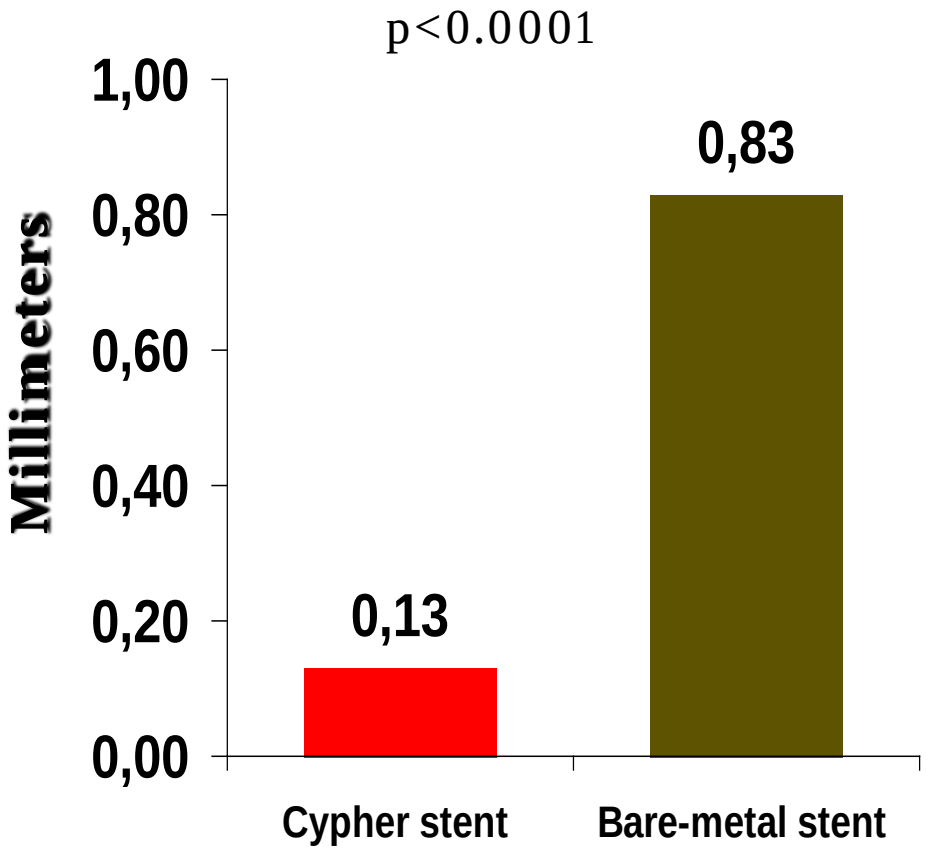


- **La disminución del TVF se explica por una reducción en el TLR (3.7% vs.12.6% p<0.0001)**
- **Trombosis del stent: no hay diferencia entre ambos grupos (3.4% Cypher vs 3.6% Bare-metal; p=NS)**

Presented at ACC 2006

TYPHOON Trial: Angiographic Substudy

In-stent late lumen loss among angiographic cohort (mm)



- **La perdida intraluminal In-stent fue inferior en el grupo de stents Cypher comparado con lo stents no medicados (0.13 mm vs. 0.83 mm; p<0.0001)**

PASSION: Resultados Clínicos

Table 1. Baseline Clinical Characteristics.*

Characteristics	Paclitaxel-Eluting Stent (N=310)	Uncoated Stent (N=309)	P Value
End point	**Taxus**	**Bare-metal stent**	**p**
Composite primary end point (%) Death/MI/TLR	**8.8**	**12.8**	**0.12**
Death/MI	**5.5**	**7.2**	**0.40**
TLR*	**5.3**	**7.8**	**0.23**
Stent thrombosis	**1.0**	**1.0**	**0.99**

***Defined as ischemia-driven PCI of target lesions, plus a 5-mm margin from the proximal and distal stent edges, or CABG of target vessel**

Laarman GJ et al. *N Engl J Med* 2006; 355:1105-1113.

Interventional Cardiology

Meta-analysis of clinical trials on use of drug-eluting stents for treatment of acute myocardial infarction

Vincenzo Pasceri, MD, PhD, FACC,[a] Giuseppe Patti, MD,[b] Giulio Speciale, MD,[a] Christian Pristipino, MD,[a] Giuseppe Richichi, MD,[a] and Germano Di Sciascio, MD, FACC[b] *Rome, Italy*

Background Recent trials have shown the effects of drug-eluting stents (DES) in treatment of acute myocardial infarction (AMI), but data on the clinical outcome are still incomplete.

Methods We performed a meta-analysis of all trials comparing DES and bare-metal stents (BMS) in AMI.

Results We found 7 randomized trials comparing the effects of DES and BMS in AMI, enrolling a total of 2357 patients (1177 with DES and 1180 with BMS) with a follow-up of 8 to 12 months. Incidence of major cardiac events (death, myocardial infarction, or revascularization) was 9.3% in patients treated with DES and 17.6% in patients with BMS, with a relative risk (RR) of 0.53 with 95% CI 0.43 to 0.66. Incidence of death or myocardial infarction was similar in the two groups, occurring in 5.8% of patients with DES and 6.9% of patients treated with BMS, with an RR of 0.84 (95% CI 0.62-1.15). Target lesion revascularization occurred in 4.8% of DES and in 12.0% of BMS patients, with an RR of 0.40 (95% CI 0.30-0.54). Stent thrombosis occurred in 2.3% in DES versus 2.6% in BMS patients, with an RR of 0.87 (95% CI 0.53-1.45). There was no heterogeneity among trials in any of the analyses (I^2 = 0% for all).

Conclusions Drug-eluting stents significantly reduce need for revascularization in patients with AMI, without changes in incidence of death or myocardial infarction. Use of DES is not associated with an increased risk of stent thrombosis at 1-year follow-up. (Am Heart J 2007;153:749-54.)

	Pasceri	STRATEGY	PASSION	TYPHOON	SESAMI	HAAMU-STENT	MISSION
No. of patients	65	175	605	712	320	164	316
Female sex	18%	27%	24%	22%	19%	28%	22%
Mean age (y)	60	63	61	59	61	63	59
DES	Cypher	Cypher	Taxus Express	Cypher	Cypher	Taxus Express	Cypher
Angiographic FU	100%	90%	No	26%	52%	88%	82%
IIb/IIIa	90%	100%	27%	72%	NA	100%	100%
LAD culprit	50%	45%	45%	50%	50%	44%	55%
Rescue PCI	18%	No	No	No	18%	45%	No
Follow-up (m)	12	8	12	12	12	12	12
MACE	21.7% Death/MI/TVR	25% Death/MI/TVR	10.9% Death/MI/TLR	10.3% Death/MI/TVR	11.8% Death/MI/TVR	15.2% Death/MI/TVR	18.6% Death/MI/TVR

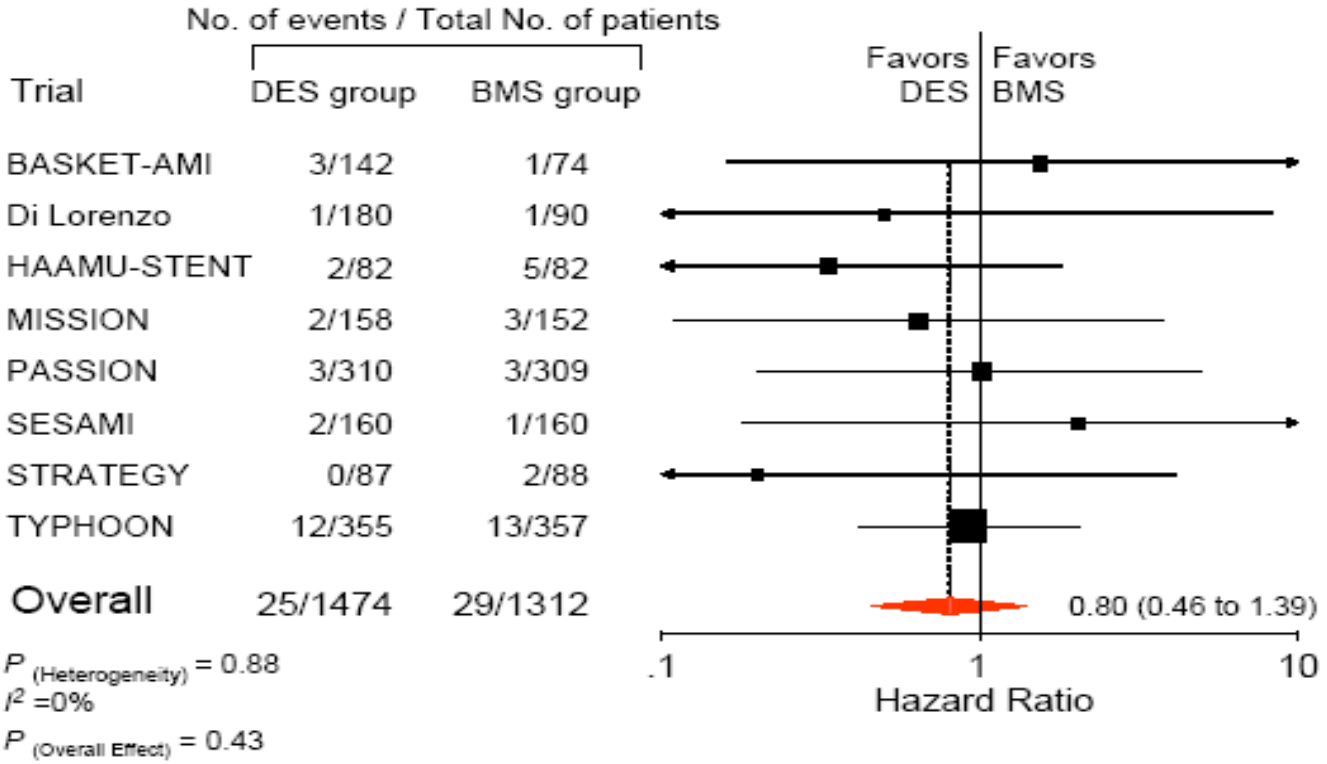
Pasceri V et al. *Am Heart J* 2007; 153:749-754

Combined outcomes

End point	DES, n=1177 (%)	Bare-metal stents, n=1180 (%)	p
MACE	9.3	17.6	<0.0001
Death/MI	5.8	6.9	NS
TLR	4.8	12	<0.0001
Stent thrombosis	2.3	2.6	NS

Pasceri V et al. *Am Heart J* 2007; 153:749-754.

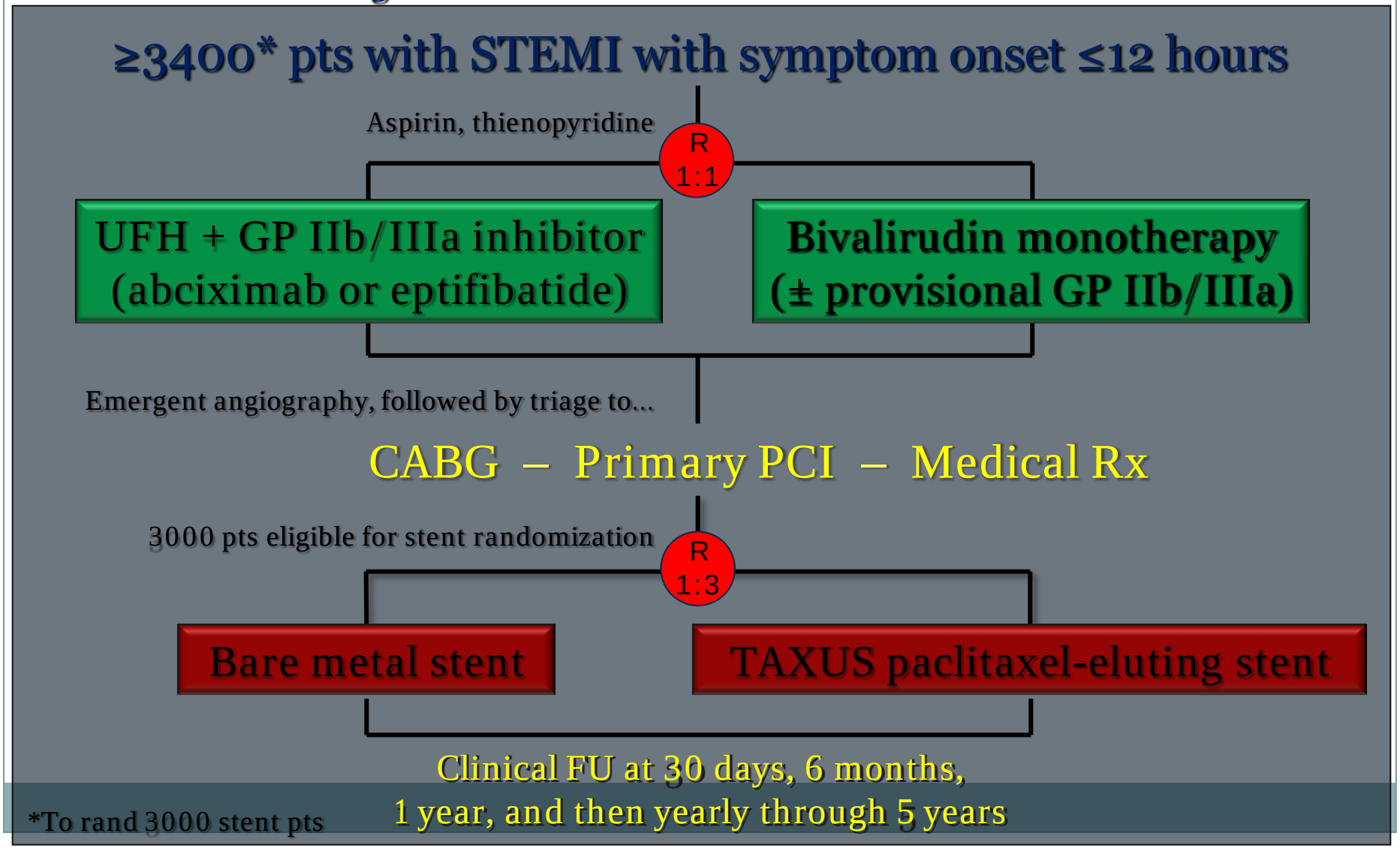
Meta-análisis: DES in AMI:1-year stent thrombosis



Kastrati A et al. Eur Heart J 2007;28:2706-13

HORIZONS AMI

Harmonizing Outcomes with Revascularization and Stents in AMI



HORIZONS-AMI

Paclitaxel-Eluting Stents versus Bare-Metal Stents in Acute Myocardial Infarction

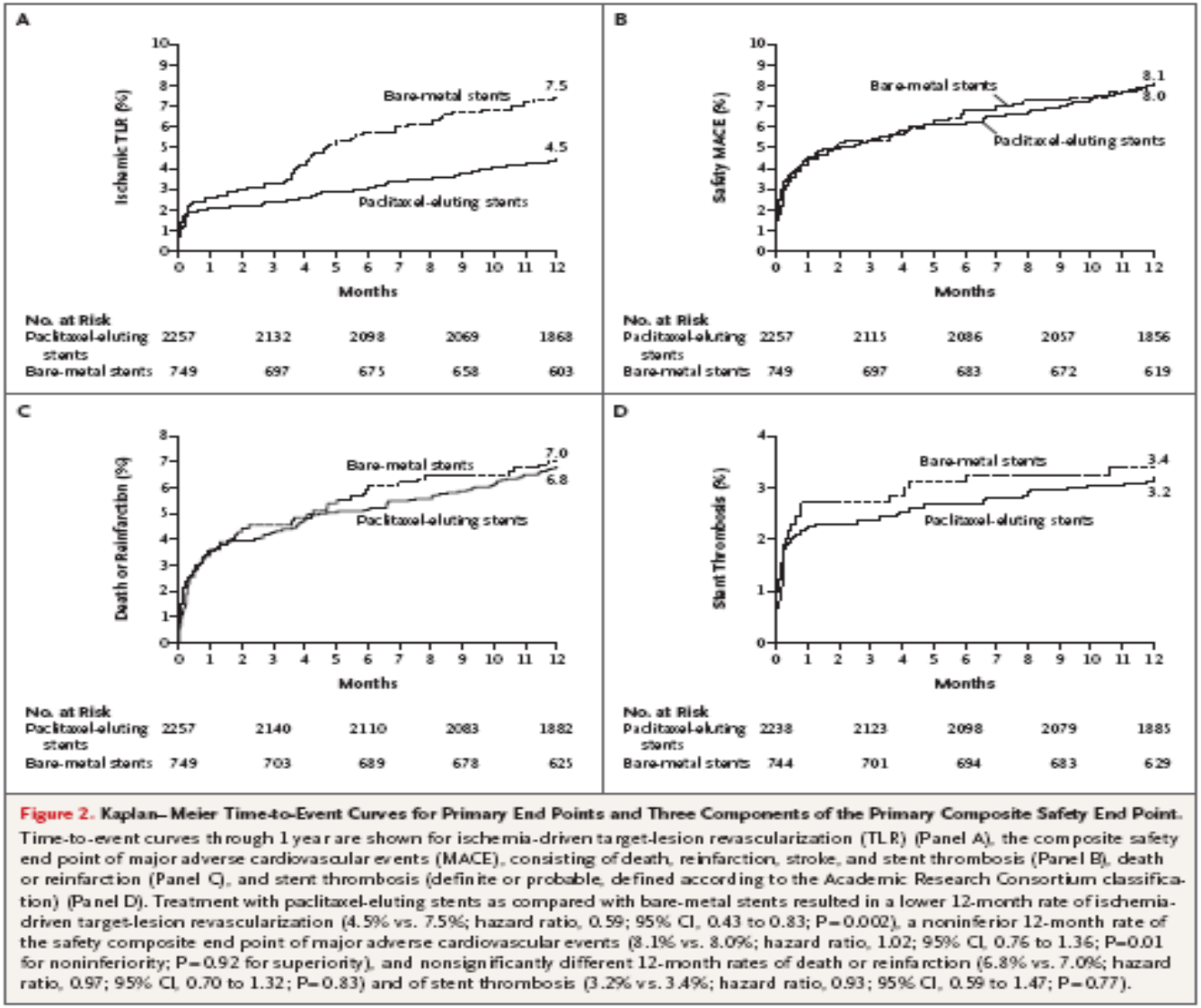


Figure 2. Kaplan–Meier Time-to-Event Curves for Primary End Points and Three Components of the Primary Composite Safety End Point. Time-to-event curves through 1 year are shown for ischemia-driven target-lesion revascularization (TLR) (Panel A), the composite safety end point of major adverse cardiovascular events (MACE), consisting of death, reinfarction, stroke, and stent thrombosis (Panel B), death or reinfarction (Panel C), and stent thrombosis (definite or probable, defined according to the Academic Research Consortium classification) (Panel D). Treatment with paclitaxel-eluting stents as compared with bare-metal stents resulted in a lower 12-month rate of ischemia-driven target-lesion revascularization (4.5% vs. 7.5%; hazard ratio, 0.59; 95% CI, 0.43 to 0.83; P=0.002), a noninferior 12-month rate of the safety composite end point of major adverse cardiovascular events (8.1% vs. 8.0%; hazard ratio, 1.02; 95% CI, 0.76 to 1.36; P=0.01 for noninferiority; P=0.92 for superiority), and nonsignificantly different 12-month rates of death or reinfarction (6.8% vs. 7.0%; hazard ratio, 0.97; 95% CI, 0.70 to 1.32; P=0.83) and of stent thrombosis (3.2% vs. 3.4%; hazard ratio, 0.93; 95% CI, 0.59 to 1.47; P=0.77).

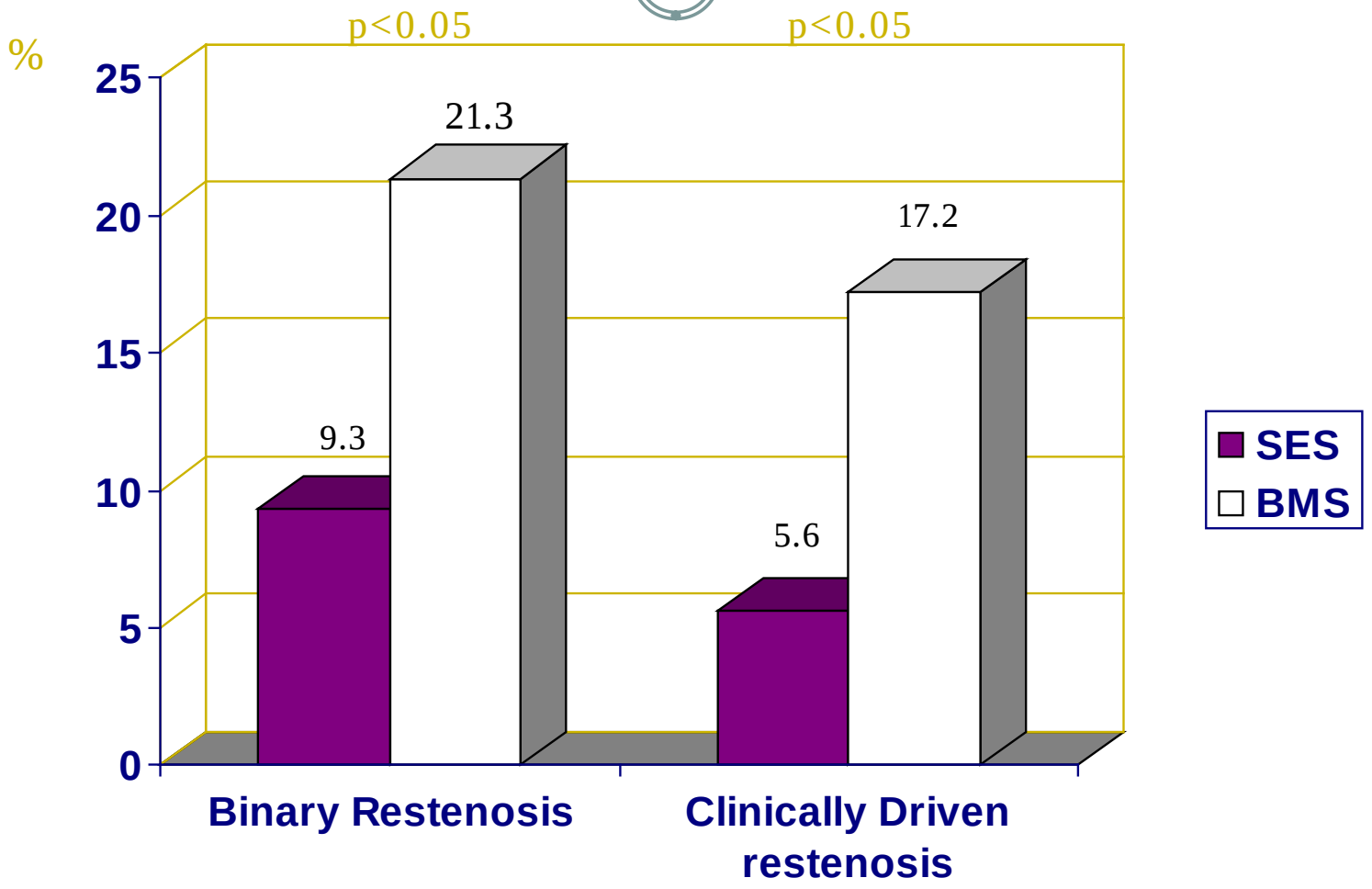
Maintenance of Long-Term Clinical Benefit with Sirolimus-Eluting Stents in Patients with ST-Segment Elevation Myocardial Infarction: Three-year results of the SESAMI Trial

Musto C, Fiorilli R, De Felice F, Nazzaro MS, Cifarelli A, Violini R

Interventional Cardiology Department, San Camillo Hospital, Rome

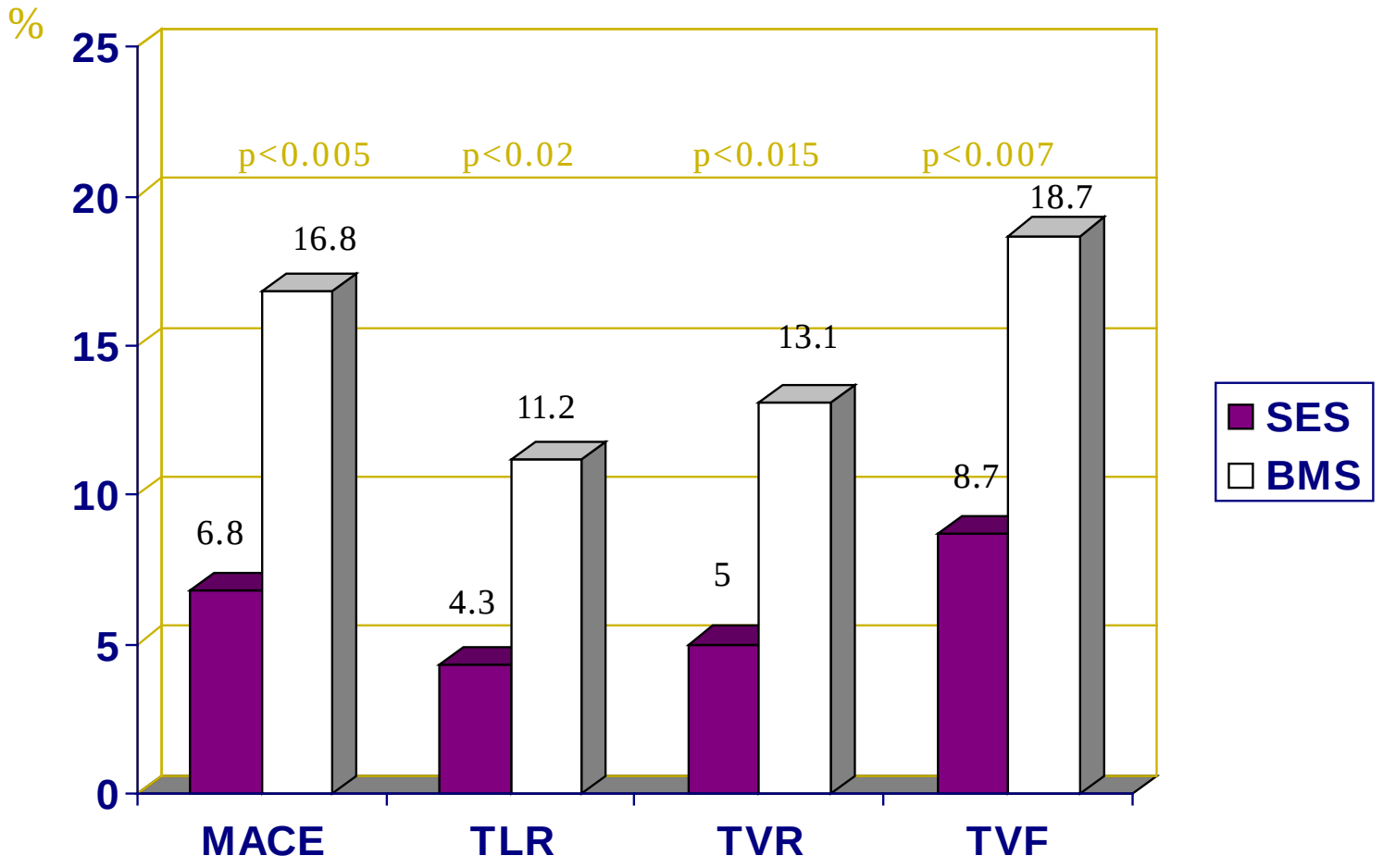
320 pacientes incluidos

1-year angiographic follow-up



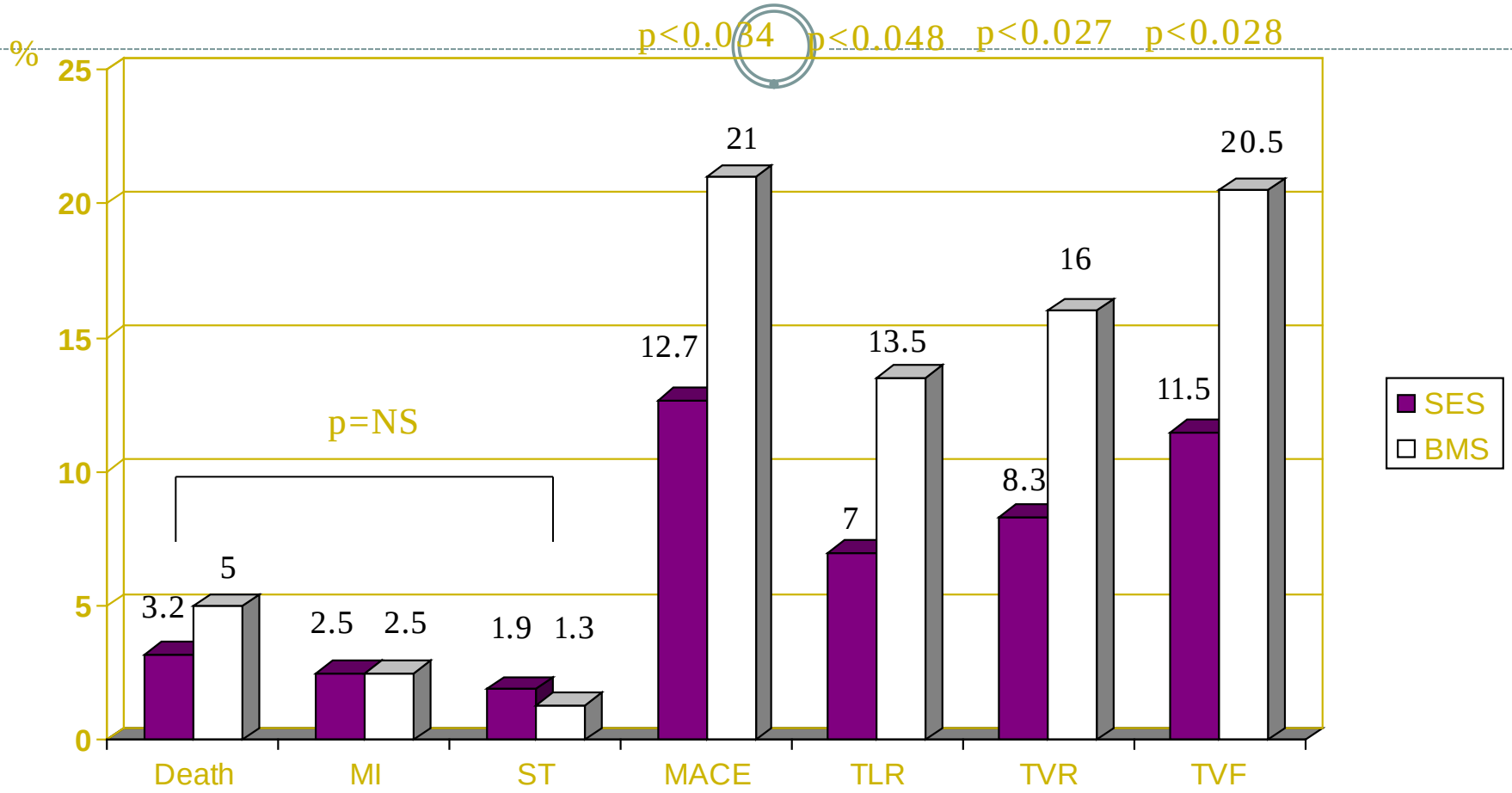
Menichelli M et al. J Am Coll Cardiol 2007;49:1924-30

CLINICAL OUTCOME: 1-year follow-up



Menichelli M et al. J Am Coll Cardiol 2007;49:1924-30

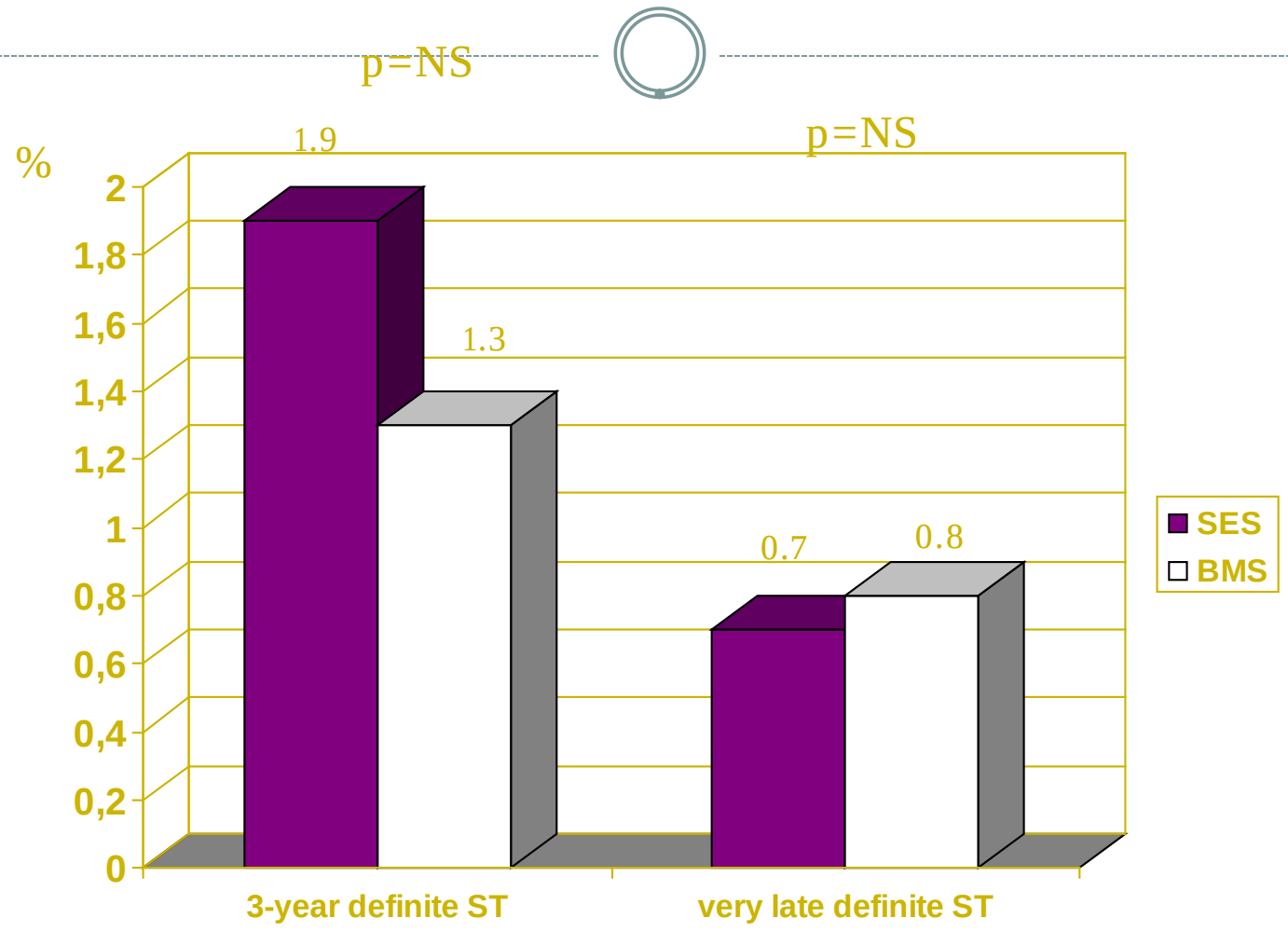
CLINICAL OUTCOME: 3-year follow-up



Complete SES group F-U: 98%

Complete BMS group F-U: 97.5%

Stent Thrombosis



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MINI-FOCUS ISSUE: ACUTE MYOCARDIAL INFARCTION
Clinical Research

Four-Year Follow-Up of TYPHOON (Trial to Assess the Use of the CYPHer Sirolimus-Eluting Coronary Stent in Acute Myocardial Infarction Treated With BalloON Angioplasty)

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Paris, Ollioules, Clamart, Nantes, Toulouse, and Montpellier, France; Pavia, Italy; London, United Kingdom; Zabrze, Poland; Utrecht, the Netherlands; Perth, Australia; Freiburg, Germany; Riga, Latvia; Budapest, Hungary; and Waterloo, Belgium

TYPHOON Resultados a 4 años

Sobre 501 pacientes seguidos

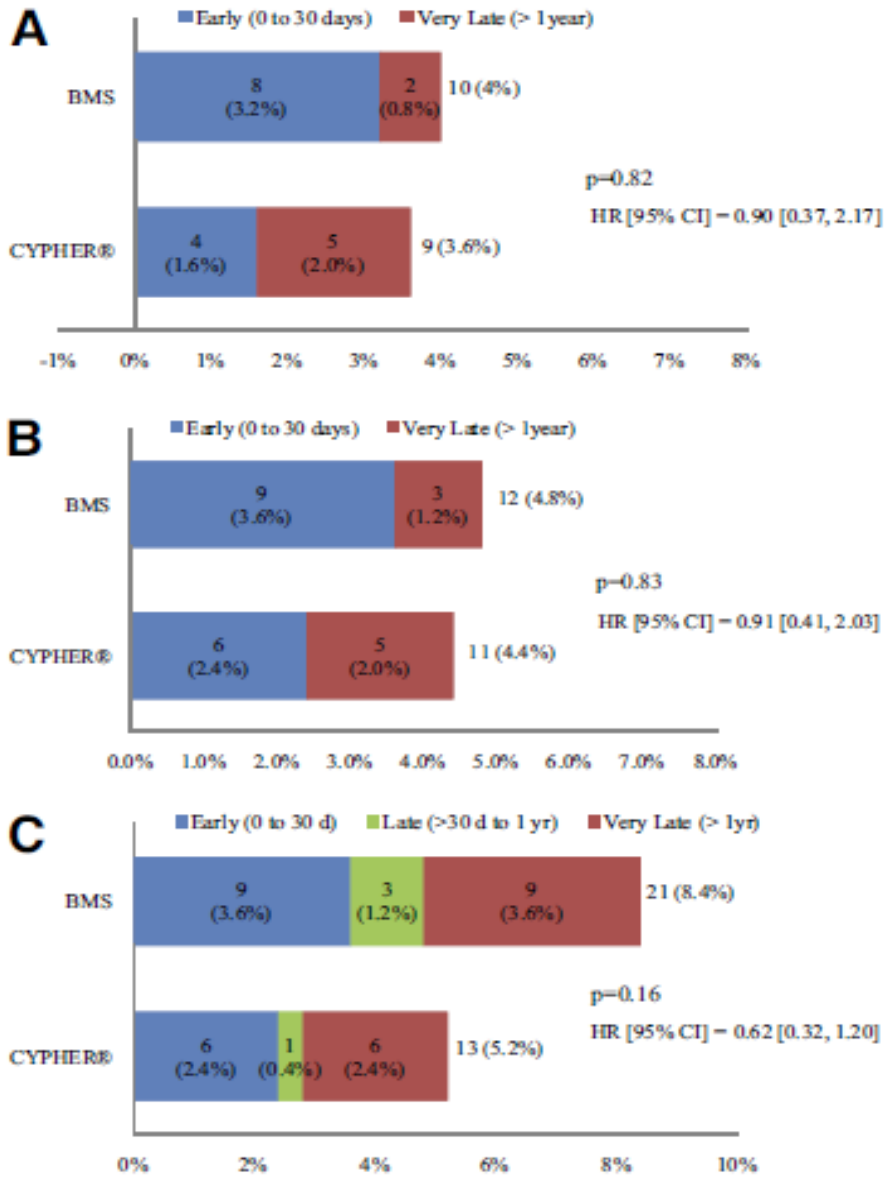
End point	Cypher (%)	Bare-metal stent (%)	p
Death	4.0	6.4	0.23
Cardiac death	3.2	4.8	0.37
MI	4.8	4.0	0.83
TLR	7.2	15.2	0.005
TVR	9.6	12.2	0.013

Spaulding C. EuroPCR 2009; May 19-22, 2009; Barcelona, Spain.

TYPHOON Resultados a 4 años

- En el grupo DES el 92 % de los pacientes estaba libre de revascularización a los 4 años, siendo de 96 % en el primer año

- En el grupo de Stent convencional el 85% de los pacientes estaba en la misma condición, siendo del 89 % en el primer año



(A) Definite stent thrombosis. **(B)** Definite/probable stent thrombosis. **(C)** Definite/probable/possible stent thrombosis. Numbers indicate the number of stent thrombosis cases with the percentage in parentheses. ARC = Academic Research Consortium; other abbreviations as in Figure 2.

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5-Year Follow-Up After Primary Percutaneous Coronary Intervention With a Paclitaxel-Eluting Stent Versus a Bare-Metal Stent in Acute ST-Segment Elevation Myocardial Infarction

A Follow-Up Study of the PASSION (Paclitaxel-Eluting Versus Conventional Stent in Myocardial Infarction With ST-Segment Elevation) Trial

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Jan G. P. Tijssen, PhD,† Jeroen van Etten, MD,* Mark S. Patterson, MBBS, PhD,*
Ton Slagboom, MD,* Ferdinand Kiemeneij, MD, PhD,* Gerrit J. Laarman, MD, PhD§

Amsterdam, Nieuwegein, and Tilburg, the Netherlands

Table 3. Clinical Outcome at 5 Years

Adverse Cardiac Events	PES (n = 310)	BMS (n = 309)	HR	95% CI	p Value
Cardiac death, recurrent MI, or TLR	56 (18.6)	66 (21.8)	0.82	0.58–1.18	0.28
Cardiac death	27 (8.9)	35 (11.5)	0.76	0.46–1.25	0.28
Recurrent MI	19 (6.8)	2 (4.3)	1.58	0.77–3.26	0.21
Cardiac death or MI	45 (15.0)	44 (14.6)	1.02	0.67–1.55	0.92
TLR	22 (7.7)	30 (10.5)	0.71	0.41–1.23	0.21

Values are expressed as n (%).

Percentages were estimated using the Kaplan-Meier method.

CI = confidence interval; HR = hazard ratio; TLR = target lesion revascularization; other abbreviations as in Table 1.

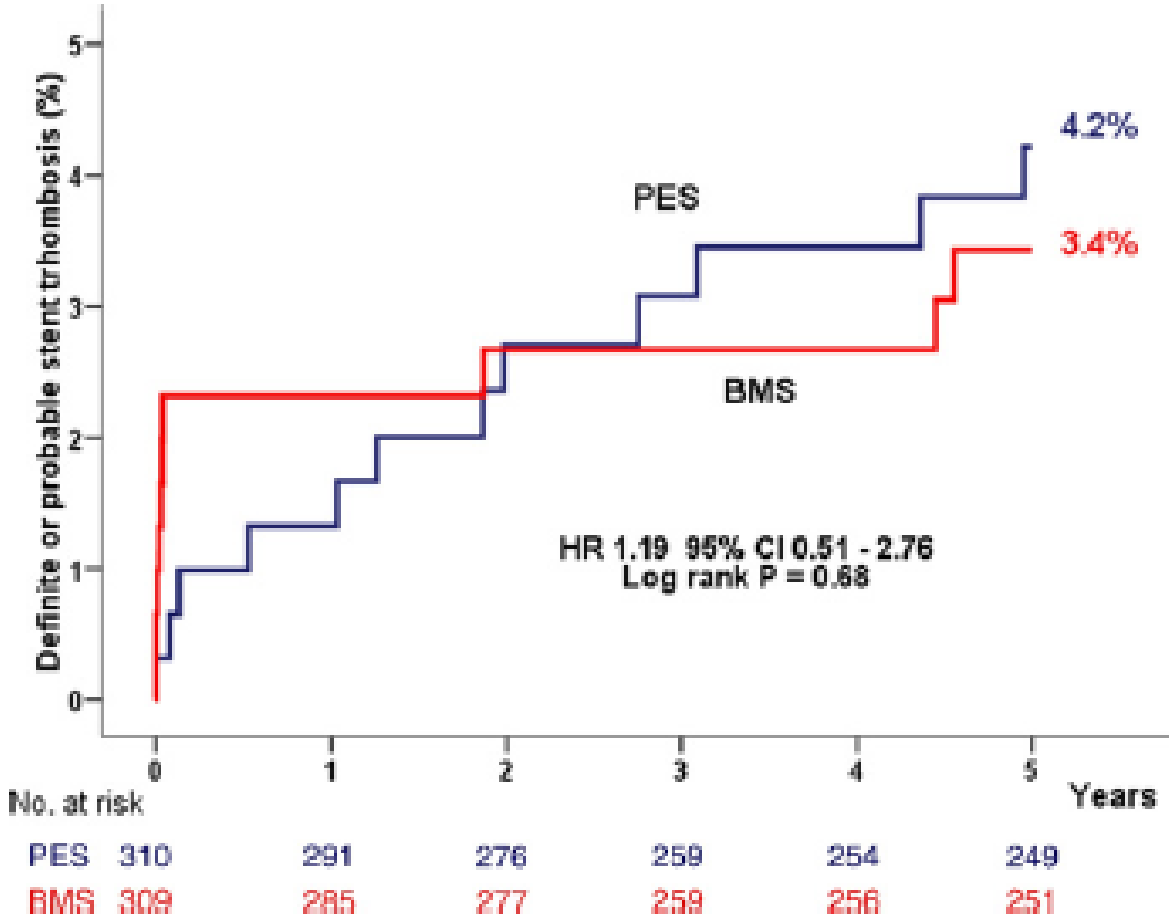

Figure 3. Kaplan-Meier Time-to-Event Curve for the Occurrence of Definite or Probable Stent Thrombosis

PASSION: Stent thrombosis

Stent thrombosis	Drug-eluting stent, n (%)	Bare-metal stent, n (%)	p
Definite	10 (3.6)	5 (1.7)	0.20
Definite or probable	12 (4.2)	10 (3.4)	0.85
Possible	20 (6.8)	19 (6.7)	0.93

Vink M. American College of Cardiology 2010 Scientific Sessions; March 16, 2010; Atlanta, GA.

Table 4. Incidence of ST According to Definition of the Academic Research Consortium, Classified by Timing of Event

ST	PES (n = 310)	BMS (n = 309)	HR	95% CI	p Value
Definite or probable ST, n (%)	12 (4.2)	10 (3.4)	1.19	0.51–2.76	0.68
Acute	1	0			
Subacute	1	7			
Late	2	0			
Very late	8	3			
Definite ST, n (%)	11 (3.9)	5 (1.7)	2.19	0.76–6.29	0.14
Acute	1	0			
Subacute	1	3			
Late	1	0			
Very late	8	2			

Table 1. Main Characteristics of Randomized Trials of DES Versus BMS in Primary PCI With Long-Term Follow-Up (≥3 Years)

Study (Ref. #)	Sample Size (DES/BMS)	Type of DES	Angiographic Follow-Up	Follow-Up (Months)	Completeness of Follow-Up
DEDICATION (16)	313/313	SES, PES and ZES	No	Median 42	100%
PASEO (6)	180/90	SES and PES	No	Mean 41	100%
STRATEGY (19)	87/88	SES	No	60	100%
SESAMI (17)	160/160	SES	No	36	98%
MISSION (18)	152/152	SES	Yes	36	91%*
TYPHOON (13)	355/357	SES	Yes	48	70%
PASSION (14)	310/309	PES	No	60	98%

*100% for survival status; 91% for other clinical events.

BMS = bare-metal stent(s); DEDICATION = Drug Elution and Distal Protection In Acute Myocardial Infarction trial; DES = drug-eluting stent(s); MISSION = A Prospective Randomised Controlled Trial to Evaluate the Efficacy of Drug-Eluting Stents versus Bare-Metal Stents for the Treatment of Acute Myocardial Infarction; PASEO = Paclitaxel- or Sirolimus-Eluting Stent Versus Bare Metal Stent In Primary Angioplasty randomized trial; PASSION = Paclitaxel Eluting Stent Versus Conventional Stent In ST-Segment Elevation Myocardial Infarction trial; PCI = percutaneous coronary intervention; SESAMI = Sirolimus-Eluting Stent Versus Bare-Metal Stent In Acute Myocardial Infarction trial; STRATEGY = Single High-Dose Bolus Tirofiban and Sirolimus-Eluting Stent vs. Abciximab and Bare-Metal Stent In Myocardial Infarction trial; TYPHOON = Trial to Assess the Use of the Cypher Sirolimus-Eluting Coronary Stent In Acute Myocardial Infarction Treated With Balloon Angioplasty; ZES = zotarolimus-eluting stent(s).

Table 2. Outcomes of Randomized Trials of DES Versus BMS in Primary PCI With Long-Term Follow-Up (≥3 Years)

	Death (%)				TVR (%)				ST (%)*			
Study (Ref. #)	DES	BMS	Estimated OR (95% CI)	p Value	DES	BMS	Estimated OR (95% CI)	p Value	DES	BMS	Estimated OR (95% CI)	p Value
DEDICATION (16)	10.5	6.4	1.73 (0.97–3.08)	0.06	8.9	19.8	0.40 (0.25–0.64)	<0.01	2.9	3.2	0.90 (0.36–2.24)	0.82
PASEO (6)	8.3	12.2	0.65 (0.29–1.49)	0.31	6.1	21.1	0.24 (0.11–0.54)	<0.01	1.1	2.2	0.49 (0.07–3.57)	0.48
STRATEGY (19)	18.4	15.9	1.19 (0.54–2.62)	0.66	10.3	26.1	0.33 (0.14–0.75)	0.01	6.9	7.9	0.86 (0.28–2.66)	0.79
SESAMI (17)	3.2	5.0	0.61 (0.20–1.92)	0.40	8.3	16.0	0.46 (0.23–0.92)	0.03	5.1	5.1	1.00 (0.37–2.73)	1.00
MISSION (18)	4.4	6.6	0.69 (0.25–1.85)	0.46	8.9	15.8	0.54 (0.27–1.09)	0.09	3.1	2.0	1.69 (0.40–7.20)	0.48
TYPHOON† (13)	4.0	6.6	0.61 (0.27–1.36)	0.23	11.9	21.5	0.49 (0.30–0.80)	<0.01	5.3	5.5	0.92 (0.42–2.00)	0.83
PASSION (14)	8.9	11.5	0.75 (0.45–1.27)	0.29	7.7	10.5	0.73 (0.42–1.26)	0.26	4.2	3.4	1.19 (0.52–2.69)	0.68
Meta-analysis			0.89 (0.64–1.24)				0.46 (0.36–0.58)				0.99 (0.68–1.45)	

*Definitions of ST varied among studies. The ARC definition was used for all except PASEO. DEDICATION, MISSION, TYPHOON, and PASSION reported definite/probable ST, whereas STRATEGY and SESAMI reported definite/probable/possible. †Analysis based on actual data (501 patients).

ARC = Academic Research Consortium; CI = confidence interval; OR = odds ratio; ST = stent thrombosis; TVR = target vessel revascularization; other abbreviations as in Table 1.

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Very Late Stent Thrombosis After Primary Percutaneous Coronary Intervention With Bare-Metal and Drug-Eluting Stents for ST-Segment Elevation Myocardial Infarction

A 15-Year Single-Center Experience

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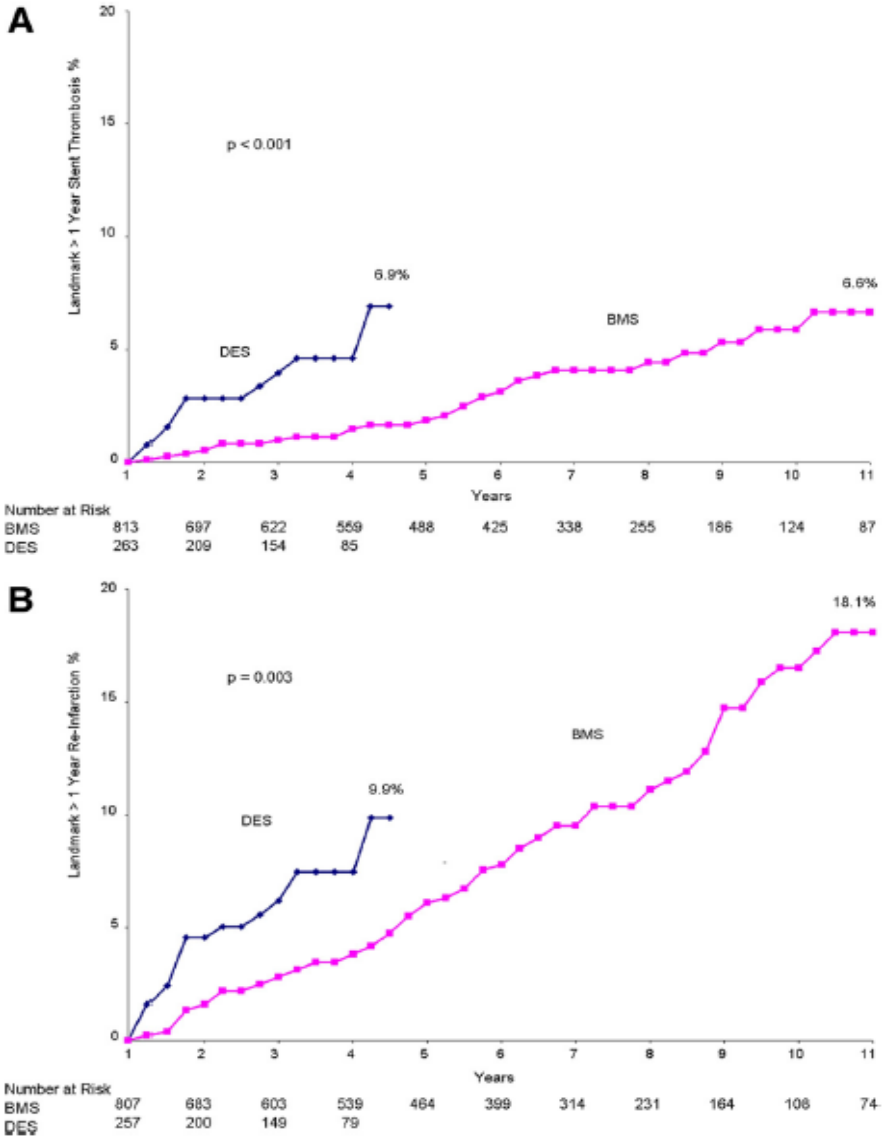
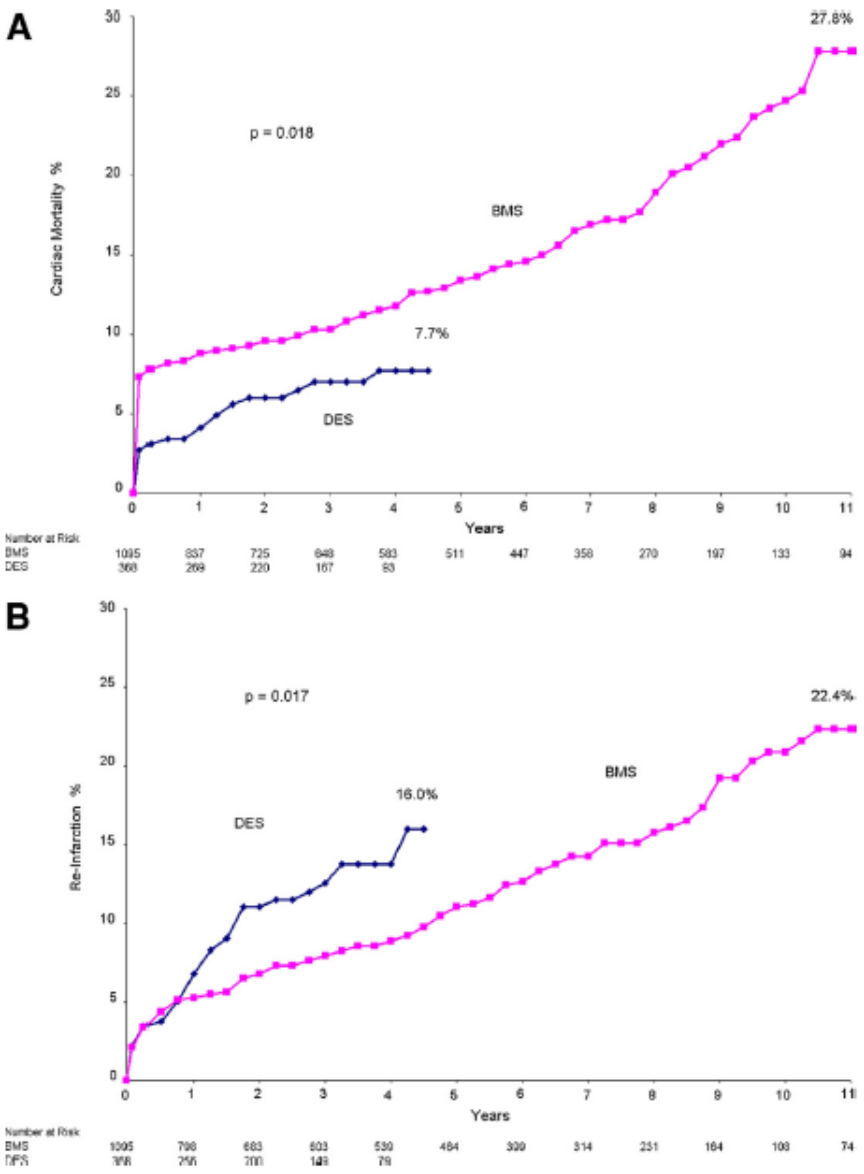


(A) Landmark analysis of the cumulative frequency of very late stent thrombosis (VLST) (>1 year) comparing BMS and DES. **(B)** Landmark analysis of the cumulative frequency of reinfarction (>1 year) comparing BMS and DES. The BMS were implanted exclusively from 1995 to 2002, whereas both stents were implanted from 2003 to 2009. Abbreviations as in Figure 1.



(A) Cumulative cardiac mortality rates after primary PCI for STEMI comparing BMS and DES. **(B)** Cumulative reinfarction rates after primary PCI for STEMI comparing BMS and DES. BMS were implanted exclusively from 1995 to 2002, whereas both stents were implanted from 2003 to 2009. Abbreviations as in Figure 1.

CONCLUSION

- DES no tienen un impacto negativo sobre la mortalidad
- DES disminuyen en gran medida la necesidad de revascularización del vaso culpable en casi 50%
- No existen evidencias estadísticas fuertes, en estudios randomizados, de un aumento significativo en la incidencia de trombosis


MUCHAS GRACIAS!

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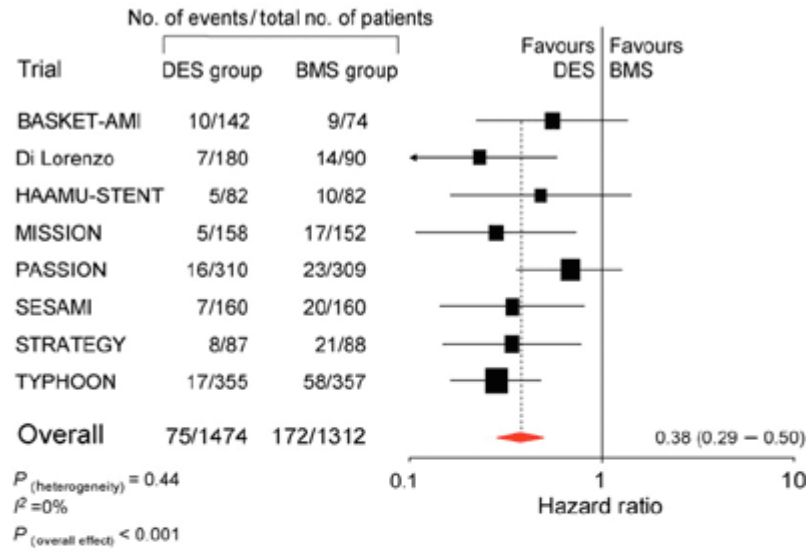
(A)



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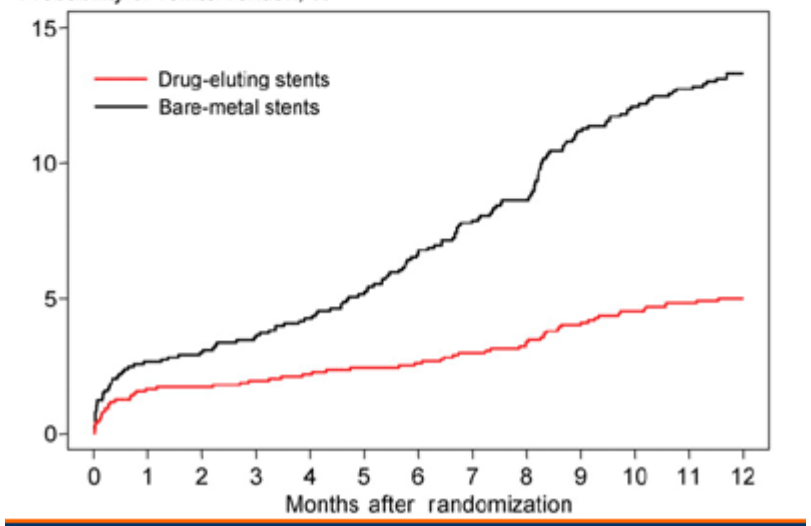

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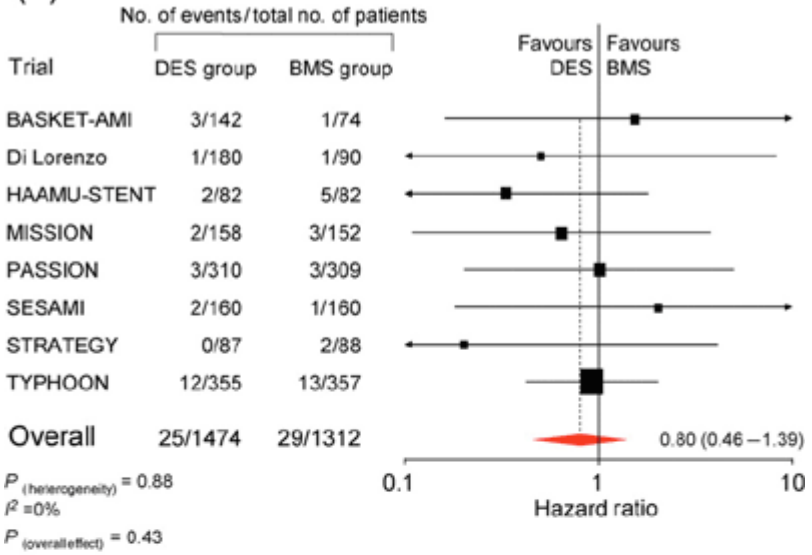
(A)



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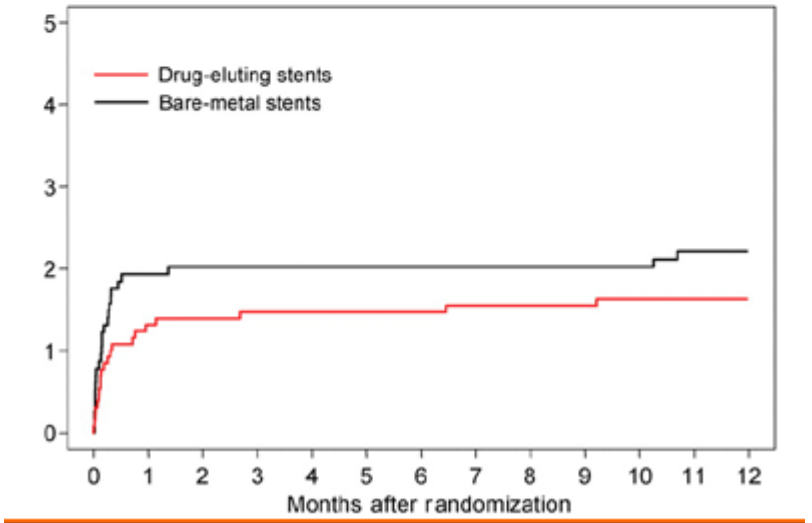

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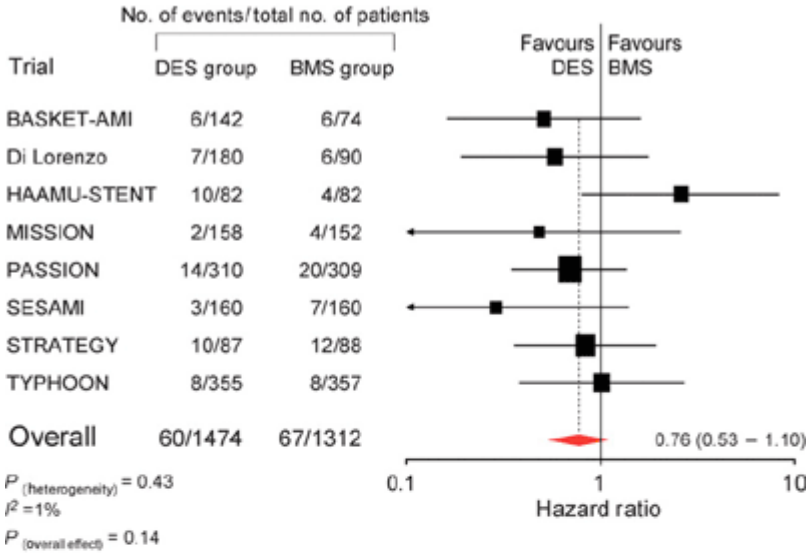
(A)



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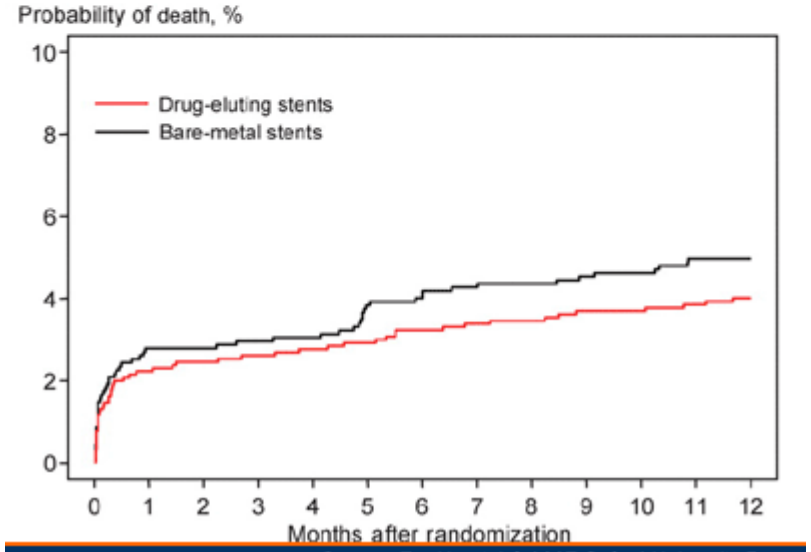

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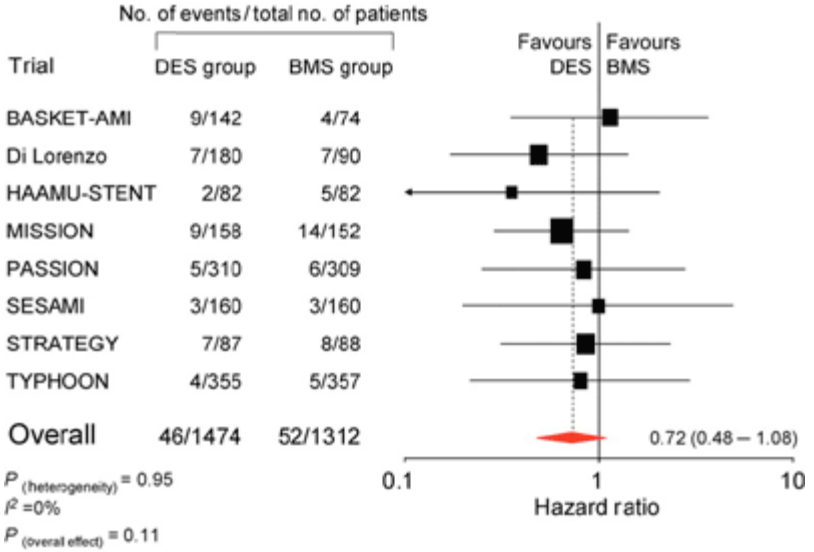
(A)



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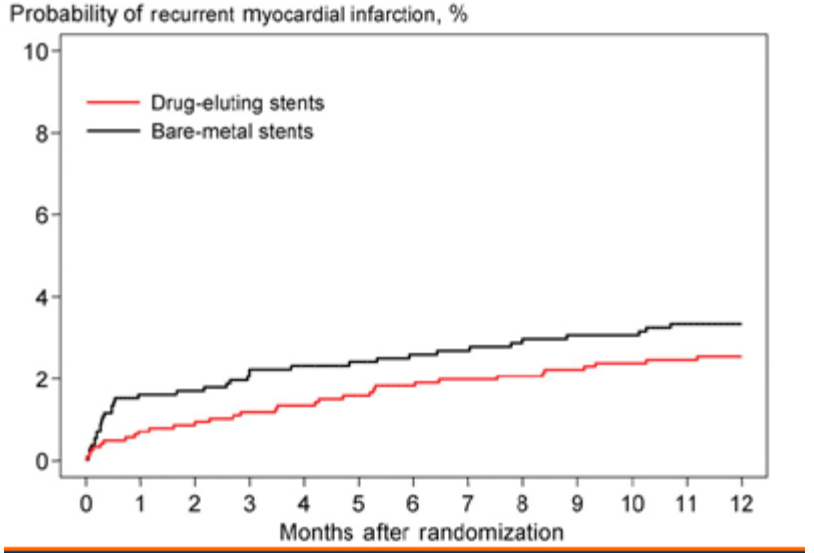

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On-label" stent use was defined by the study criteria for the initial randomized DES studies (1,2) as follows: >18 years old, single de novo native coronary artery lesions <30 mm in length without thrombus, left ventricular ejection fraction ≥25%, no MI within 7 days of the procedure, and no evidence of renal failure (serum creatinine ≤2.0 mg/dl). Stent use in all other patients was defined as "off-label." This definition of "on-label" use is similar to the indications for both Cypher (Cordis Corporation, Miami, Florida) and Taxus (Boston Scientific, Billerica, Massachusetts), with the exception that renal failure was not specifically listed as a contraindication for DES use in the indications. Nonfatal MI was defined as ischemic symptoms and an elevation of creatine kinase-MB >2x the upper limit of normal, with or without ST-segment elevation or development of Q waves.