I Congreso SEICAV

VI Reunión GAMES

Madrid 4-5 octubre 2012

Endocarditis tras cirugía cardiaca

Incidencia,clasificación,microorganismos causales y pronóstico

Miguel Montejo

Unidad de Enfermedades Infecciosas

Hospital Universitario Cruces

Endocarditis protésica

- Forma más grave de EI
- Elevada morbimortalidad a pesar de los avances en el tratamiento antibiótico y de la cirugía cardiaca valvular
- Ocurre en el 10-30% de todos los casos de EI

  16% Francia, 26% Europa

- **ICE 2000-05 recoge 2670 episodios de EI**

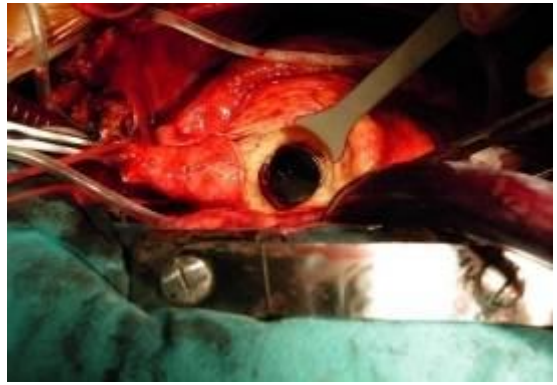
  ↓

  El 20% infecciones sobre prótesis cardíacas El 50% precisó cirugía cardiaca
  Mortalidad 23%

Murdoch RD et al. Arch Inter Med, 2008

Epidemiología

- EVP presenta el 1 -6% de los pacientes con prótesis valvular
- Incidencia de la EVP oscila entre 0,3-1,2% paciente/ año
- Más frecuente primeros 2-3 meses, se estabiliza al año
- Incidencia acumulada EIVP 12 y 60 meses: 1.0-1,4%
  3,0-5,7%
- Incidencia similar en válvula aortica y mitral
- Más frecuente en válvula mecánica ?
- Mayor probabilidad :
  - múltiples recambios valvulares
  - sustitución valvular por EVN



Habib G et al. Eur Heart J, 2009, San Román JA et al. Endocarditis infecciosa, 2002

Clasificación

Precoces : 1er año tras cirugía :

- Perioperatorio
- Quirófano
- Infección herida
- Catéteres centrales
- Sondas urinarias

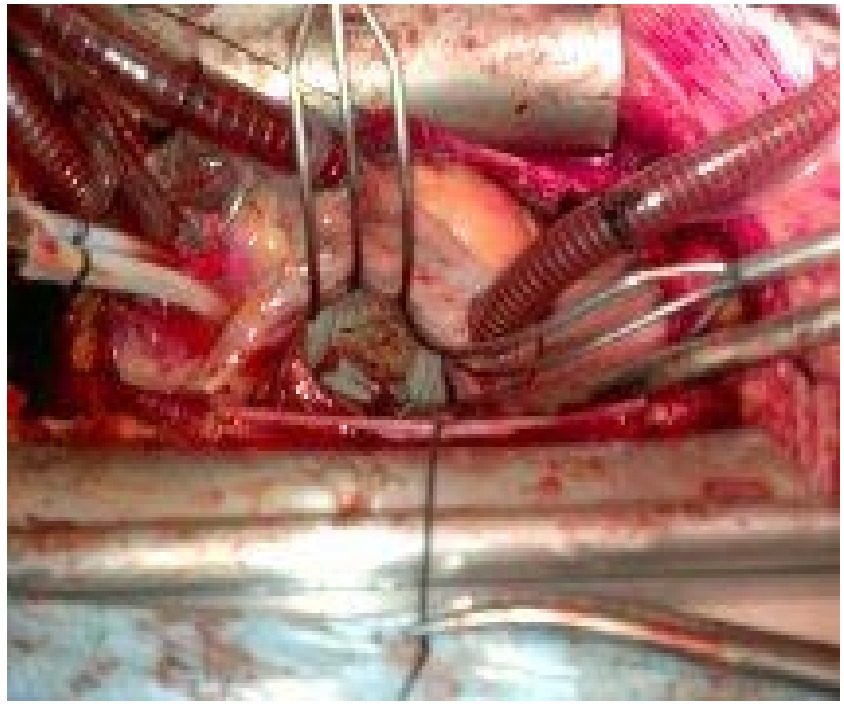
- SCN
- *S. aureus*
- *Enterococcus*

Tardías : después de 1 año : Comunitaria
Cuidados sanitarios
Bacteriemia

Patógenos similares a EVN → SCN, *S. aureus*, Estreptococos, Enterococos

Recientemente

- **EP precoz :**
  - Primeras 8 semanas tras la cirugía
  - *S. aureus* y SCN
- **EP intermedia :**
  - 9 semanas – 1 año
  - SCN
- **EP tardía :**
  - Después de 1 año
  - Perfil microbiológico similar a EVN (mayor frecuencia ECN)



San Martín J et al, J Heart Valve Dis 2010

Clasificación

- EVP asociada a cuidados sanitarios
- Nosocomial: EVP en paciente hospitalizado > 48h antes del comienzo de signos/síntomas consistentes con EI
- No-nosocomial: signos y/o síntomas de EI de inicio <48h después de ingresar en un paciente en contacto con cuidados sanitarios
  - atención domicilio o terapia iv, hemodialisis o quimio iv >30 d. antes del inicio de la EI o
  - ingreso en centro de agudos <90 d. antes comienzo de EI o
  - atención en residencia o de cuidados crónicos
- EVP adquirida en la comunidad

  Signos y/o síntomas de EI comenzando <48h después de ingresar en un paciente que no cumple criterios de infección asociada a CS
- EVP en ADVP

Anatomia patológica

- Lesión caracteristica : vegetación

Una o varias
Tamaño variable

- Frecuente la extensión perianular de la infección
  - biológicas:infección asienta en los velos → valvulitis
  - mecánicas:productos biológicos que recubren el anillo

↓

La infección asienta sobre el anillo de sutura : anulitis

abscesos
pseudoaneurismas
fistulas

Clinical Outcome and Long-Term Prognosis of Late Prosthetic Valve Endocarditis: A 20-Year Experience. 59 cases (1975-1994)

Table 1. Microorganisms causing late prosthetic valve endocarditis in 59 patients.

Microorganisms	No. (%) of cases
Streptococci	24 (41)
Viridans group	18
Streptococcus bovis	3
Streptococcus agalactiae	2
Streptococcus pneumoniae	1
Enterococci	8 (13)
Staphylococci	15 (25)
Coagulase-negative	3
Coagulase-positive	12
HACEK group*	4 (7)
Other†	4 (7)
Culture-negative	4 (7)

* *Haemophilus* species, *Actinobacillus actinomycetemcomitans*, *Cardiobacterium hominis*, *Eikenella* species, and *Kingella kingae*.

† *Candida parapsilosis*, 1; *Peptostreptococcus* species, 1; *Legionella pneumophila*, 1; and *Coxiella burnetii*, 1.

Pilar Tornos et al. CID 1997

Clinical Outcome and Long-Term Prognosis of Late Prosthetic Valve Endocarditis: A 20-Year Experience. 59 cases (1975-1994)

Table 3. Clinical courses of late prosthetic valve endocarditis in 59 patients according to etiologic agents.

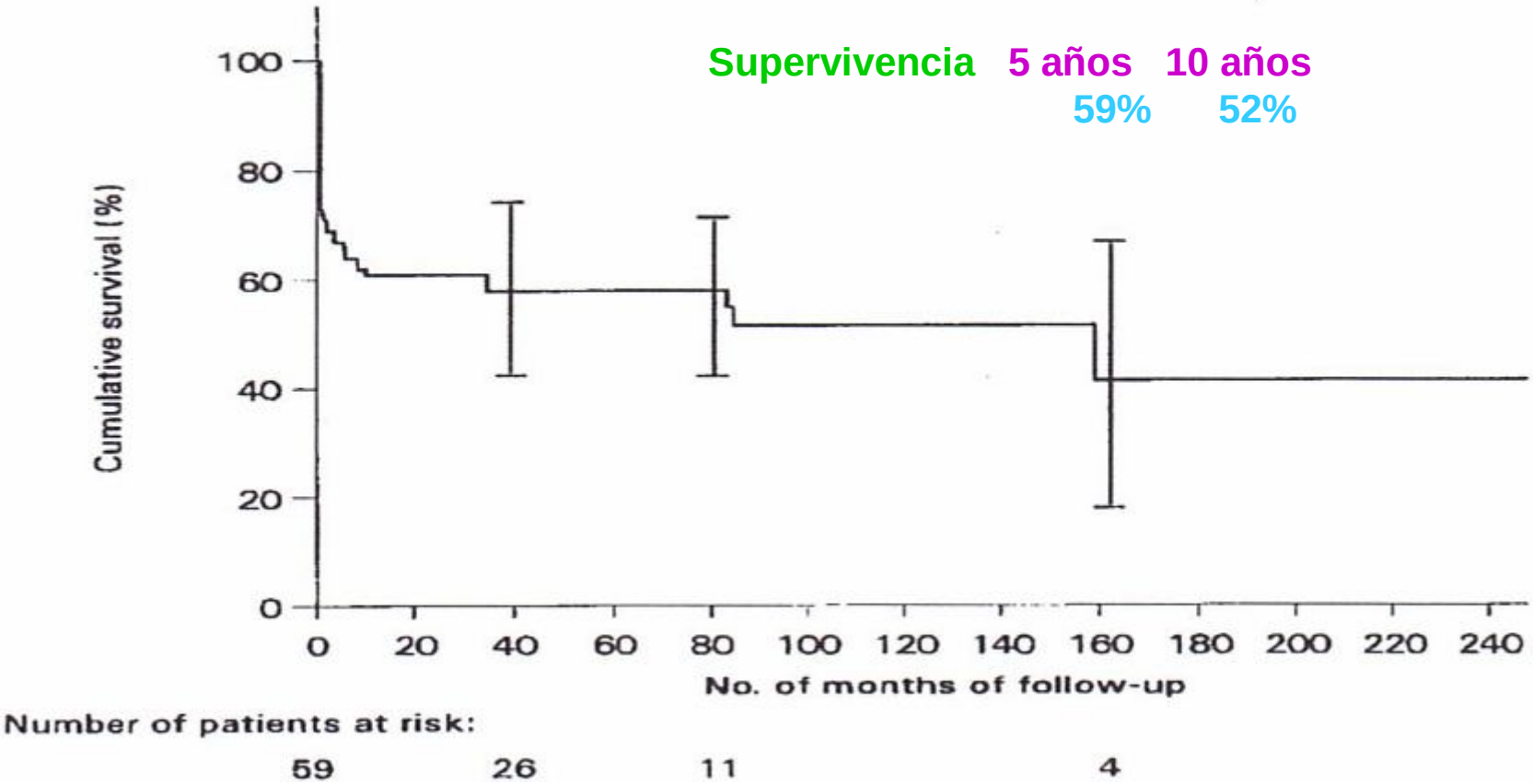
		No. (%) of cases with clinical course			
Microorganisms	No. of cases	Emboli	Heart failure	Surgical treatment	In-hospital death
Streptococci					
Viridans group	18	4 (22)	4 (22)	3 (17)	1 (6)
Streptococcus bovis	3	0	1 (33)	1 (33)	0
Streptococcus agalactiae	2	0	2 (100)	2 (100)	2 (100)
Streptococcus pneumoniae	1	0	1 (100)	1 (100)	0
Enterococci	8	4 (50)	1 (13)	1 (13)	1 (13)
Staphylococci					
Coagulase-positive	12	10 (83)	2 (17)	1 (8)	8 (67)
Coagulase-negative	3	1 (33)	2 (67)	1 (33)	0
HACEK group*	4	2 (50)	2 (50)	1 (25)	1 (25)
Other†	4	0	2 (50)	4 (100)	2 (50)
Culture-negative	4	1 (25)	2 (50)	2 (50)	0
Total	59	22 (37)	19 (32)	17 (29)	15 (25)

* *Haemophilus* species, *Actinobacillus actinomycetemcomitans*, *Cardiobacterium hominis*, *Eikenella* species, and *Kingella kingae*.

† *Candida parapsilosis*, 1; *Peptostreptococcus* species, 1; *Legionella pneumophila*, 1; and *Coxiella burnetii*, 1.

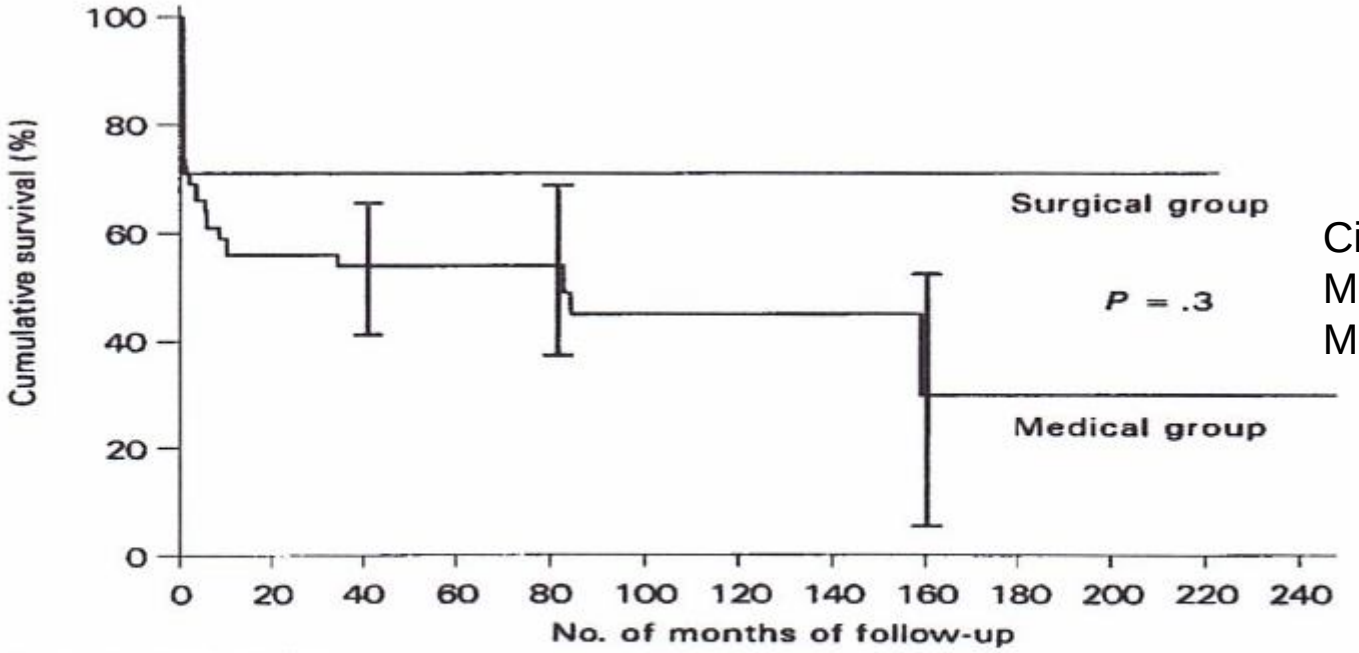
Pilar Tornos et al. CID 1997

Clinical Outcome and Long-Term Prognosis of Late Prosthetic Valve Endocarditis: A 20-Year Experience



Pilar Tornos et al. CID 1997

Clinical Outcome and Long-Term Prognosis of Late Prosthetic Valve Endocarditis: A 20-Year Experience



Number of patients at risk:

No. treated medically:	42	18	7	3
No. treated surgically:	17	8	4	

Cirugía igual los 2 G.
Mortalidad Early 31%
Mortalidad Late 9%

Pilar Tornos et al. CID 1997

Etiología

Válvula protésica

Murdoch DR, Arch Intern Med, 08

Tornos P, EI, Farreras-Rozman 04

	ICE		Barcelona	
	Precoz	**Tardía**	**Precoz**	**Tardía**
Nº Episodios	53	331	106	16
Estafilococos				
S. aureus	36%	18%	20%	15%
SCN	17%	20%	50%	11%
Estreptococos				
Grupo viridans	2%	10%	4%	24%
S. bovis	2%	7%	-	4%
Neumococo	-	1%	-	1%
S. agalactiae	-	1%	2%	1%
Otros	-	3%	2%	3%
Enterococo	8%	13%	5%	15%
Grupo HACEK	-	2%	<1%	5%
Fiebre Q	-	-	-	<1%
Otros microorganismos	9%	8%	8%	3%
Hongos	9%	3%	2%	<1%
Polimicrobiana	-	2%	<1%	2%
Cultivo negativo	17%	12%	7%	14%

Long-Term Prognosis of Early and Late Prosthetic Valve Endocarditis (1987-2002)

78 cases

Juan C. Castillo et al, Am J Cardiol 2004

TABLE 1 General Characteristics of Patients With PVE

Characteristic	Early PVE (n = 35)	Late PVE (n = 43)
Age (yrs)	55 ± 15	51 ± 16
Men	21 (60%)	28 (65%)
Site of infection		
Mitral	20 (57%)	19 (44%)
Aortic	14 (40%)	22 (51%)
Other	1 (3%)	2 (5%)
Infective microorganism*		
Staphylococcus aureus	6 (17%)	8 (19%)
Coagulase-negative staphylococci	10 (30%)	3 (7%)
Streptococcus spp.	2 (6%)	14 (33%)
Enterococcus spp.	4 (11%)	5 (12%)
Other	8 (22%)	1 (2%)
Unknown	5 (14%)	12 (28%)

*$p < 0.01$.

Long-Term Prognosis of Early and Late Prosthetic Valve (1987-2002). 78 cases

Juan C. Castillo et al, Am J Cardiol 2004

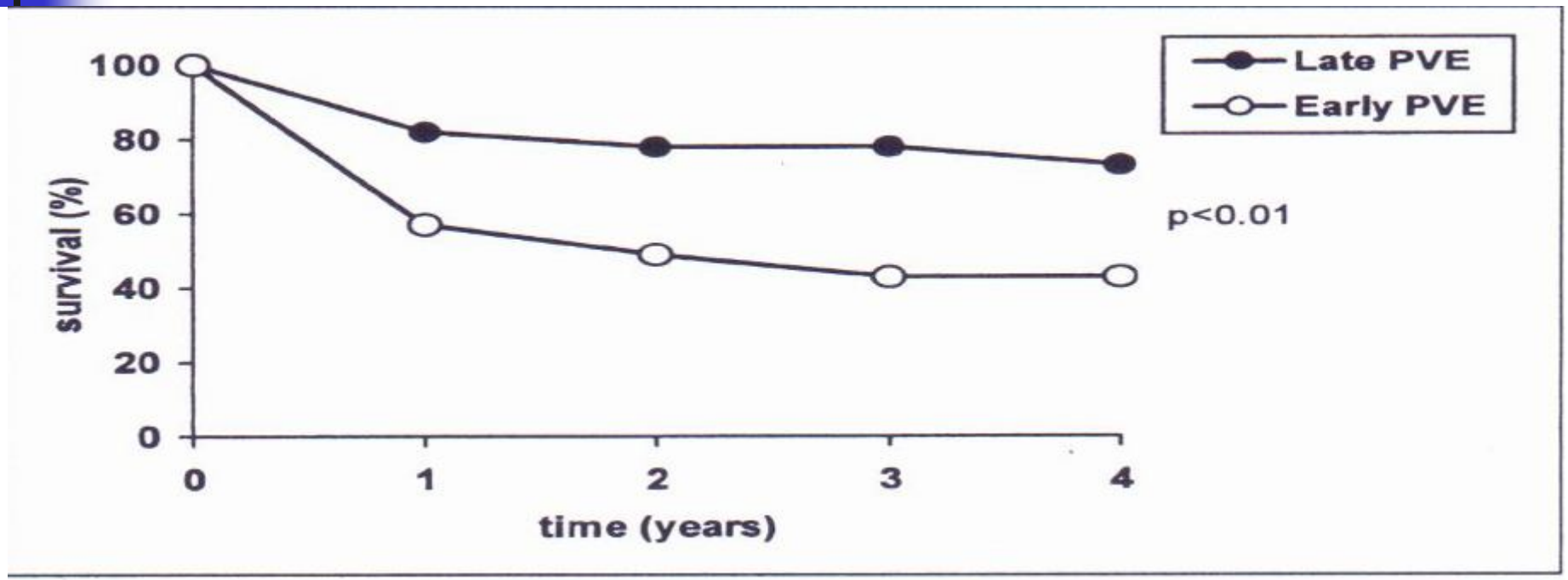
TABLE 2 Cardiac and Extracardiac Complications in 78 Cases of PVE

Complications	Early PVE (n = 35)	Late PVE (n = 43)
Heart failure*	19 (54%)	16 (37%)
Central nervous system complications	4 (11%)	7 (16%)
Persistent sepsis	6 (17%)	9 (20%)
Acute renal failure	1 (4%)	3 (6%)
Metastatic abscess	4 (11%)	4 (9%)
Mycotic aneurysm	3 (8%)	2 (4%)
Embolisms	7 (20%)	7 (17%)

*$p < 0.05$.

Long-Term Prognosis of Early and Late Prosthetic Valve Endocarditis (1987-2002). 78 cases

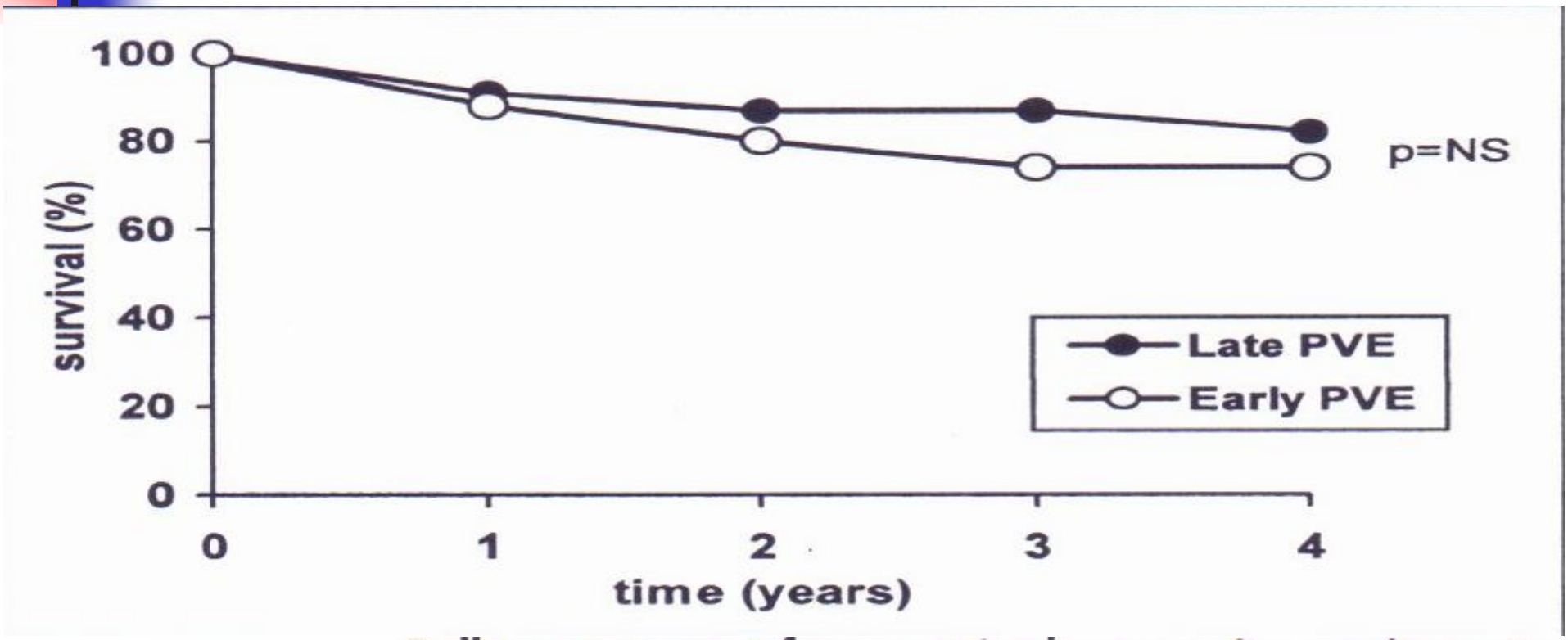
Juan C. Castillo et al, Am J Cardiol 2004



Kaplan-Meier survival curves. Differences between patients with early and late PVE were significant.

Long-Term Prognosis of Early and Late Prosthetic Valve Endocarditis (1987-2002). 78 cases

Juan C. Castillo et al, Am J Cardiol 2004



Follow-up event-free survival curves in survivors to the active phase. No significant differences in survival were observed.

The impact of Hospital-Acquired Infections on the Microbial Etiology and Prognosis of Late-Onset Prosthetic Valve Endocarditis-Free To View

Pablo Rivas et al, Chest 2005

Characteristics	1970–1986	1987–2003	p Value
Cases of PVE, No.	58	63	
Early	30	13	
Late	28	50	
Age, yr	44.2 ± 12.9	60.6 ± 11.3	< 0.0001
Male gender	33 (57)	30 (47)	NS
Comorbidities†	5 (17.8)	23 (46)	0.015
Overall frequency, %	1.82	1.64	NS
Frequency of early-onset PVE, %	0.94	0.34	< 0.001
Frequency of late-onset PVE, %	0.88	1.30	NS
Incidence rate of late-onset PVE, %/yr	0.33	0.42	NS

The impact of Hospital-Acquired Infections on the Microbial Etiology and Prognosis of Late-Onset Prosthetic Valve Endocarditis-Free To View

Variables	Early-Onset PVE (n=43) 1970-1987 1986	2003	p Value	Late-Onset PVE (n=78) 1970-1987 1986	2003	p Value
Coagulase-negative Staphylococci	9 (30)	5 (38)	NS	1 (3.6)	8 (16)	NS
S aureus	4 (13)	2 (15)	NS	0	11 (22)	0.006
Methicillin-sensitive *S aureus*	4	2	NS	0	9	0.023
MRSA	0	0		0	2	NS
Enterococci	2 (6.6)	2 (15)	NS	4 (14.2)	10 (20)	NS
S viridans	0	0		6 (21.4)	7 (14)	NS
Gram-negative bacilli†	13 (40)	1 (7.7)	0.033	4 (14.2)	2 (4)	NS
Other Gram-positive bacteria‡	0	1 (7.7)	NS	3 (10.7)	4 (8)	NS
Brucella melitensis	0	0		4 (14.2)	1 (2)	NS
Coxiella burnetti	0	0		3 (10.7)	1 (2)	NS
Candida albicans	0	0		1 (3.6)	1 (2)	NS
Unknown	2 (6.6)	2 (15)	NS	2 (7.1)	5 (10)	NS
Total	30	13		28	50	

* Data are presented as No. (%) or No. See Table 1 for expansion of abbreviation.

† Achromobacter (n = 1), *Serratia marcescens* (n = 2), *Proteus mirabilis* (n = 1), *Pseudomonas cepacia* (n = 3), *Pseudomonas maltophilia* (n = 2), *Pseudomonas aeruginosa* (n = 2), *Proteus alcaligenes* (n = 1), Pseudomonas spp (n = 1), *Xantomonas maltophilia* (n = 1), Achromobacter (n = 1), *E coli* (n = 2), *Pseudomonas putida* (n = 1), *Klebsiella pneumoniae* (n = 1), and *Enterobacter cloacae* (n = 1).

The impact of Hospital-Acquired Infections on the Microbial Etiology and Prognosis of Late-Onset Prosthetic Valve Endocarditis-Free To View

Pablo Rivas et al, Chest 2005

Characteristics	1970–1986	1987–2003	p Value
Prosthesis site			
Mitral valve	21 (36.2)	26 (41.3)	NS
Aortic valve	20 (34.4)	20 (31.7)	NS
Mitral and aortic valves	16 (27.5)	16 (25.4)	NS
Mitral, aortic, and tricuspid valves	1 (1.7)	1 (1.6)	NS
Bioprosthetic valves	26 (45)	4 (5)	< 0.0001
Hospital-acquired cases†	2 (7.1)	11 (22)	0.11
Overall mortality, %	60.3	36.5	0.009
Mortality of early-onset PVE, %	80	46	0.026
Mortality of late-onset PVE, %	39	34	NS

* Data are presented as mean ± SD or No. (%) unless otherwise indicated. NS = not significant.

† Only for patients with late-onset PVE.

The impact of Hospital-Acquired Infections on the Microbial Etiology and Prognosis of Late-Onset Prosthetic Valve Endocarditis-Free To View

Pablo Rivas et al, Chest 2005

- Cirugía en 39/50 pacientes EVP-tardía (G-2) fallecieron 13 (33,3%)
- Tratamiento médico a 11 (G-2), fallecieron 4 (36,3%)
- Sustitución valvular no factor independiente asociado con supervivencia
- 1 comorbilidad se asoció con mortalidad, ≥2 alto riesgo de mortalidad
- FRA 14% (7/50), fallo cardiaco 62% (31/50) en EVP tardía
- Solo FRA se asoció con significación con mortalidad (p=0,048)

Prosthetic valve endocarditis: who needs surgery? A multicentre study of 104 cases

G Habib et al, Heart 2005

January1991-March 2003

Factores que afectan a la mortalidad

Factor	All patients (n = 104)	In-hospital mortality			Total mortality		
		Alive (n = 82)	Dead (n = 22)	p Value	Alive (n = 61)	Dead (n = 43)	p Value
Clinical factors							
Age (years)	60 (16)	60 (15)	63 (16)	0.2	58 (15)	62 (17)	0.25
Men	70 (67%)	56 (68%)	14 (63%)	0.41	43 (70%)	27 (63%)	0.29
Early PVE	20 (19%)	14 (17%)	6 (27%)	0.22	7 (11%)	13 (30%)	0.01
Late PVE	84 (81%)	68 (83%)	16 (73%)		54 (89%)	30 (70%)	
Co-morbidity	55 (53%)	46 (56%)	9 (40%)	0.36	30 (49%)	25 (58%)	0.39
>1 co-morbidity	14 (13%)	5 (6%)	9 (41%)	0.05	5 (8%)	9 (21%)	0.07
Type of valve							
Bioprosthetic	60 (57%)	48 (58%)	12 (54%)		37 (60%	23 (54%)	
Mechanical	39 (37%)	30 (37%)	9 (41%)	0.92	20 (33%)	19 (44%)	0.32
Homograft	5 (5%)	4 (5%)	1 (5%)		4 (7%)	1 (2%)	
Valve location							
Mitral	36 (35%)	27 (33%)	9 (41%)	0.33	18 (30%)	18 (42%)	0.12
Atrial	68 (65%)	55 (67%)	13 (59%)		43 (70%)	25 (58%)	
Biological factors							
Renal failure	33 (32%)	23 (28%)	10 (45%)	0.05	17 (35%)	16 (51%)	0.13
Leucocytosis (>10⁹/l)	46 (44%)	42 (51%)	4 (18%)	0.32	29 (56%)	17 (61%)	0.85
Echocardiographic factors							
Vegetation	64 (61%)	48 (58%)	16 (72%)	0.55	31 (49%)	33 (72%)	0.03
Vegetation >10 mm long	32 (31%)	25 (30%)	7 (31%)	0.94	16 (26%)	16 (35%)	0.42
Highly mobile vegetation	47 (45%)	34 (41%)	13 (59%)	0.25	21 (34%)	26 (60%)	0.02
Abscess	53 (51%)	42 (51%)	11 (50%)	0.69	31 (51%)	22 (53%)	0.79
New prosthetic valve dehiscence	31 (30%)	22 (27%)	9 (41%)	0.28	13 (21%)	18 (42%)	0.03
Moderate or severe regurgitation	30 (29%)	18 (22%)	12 (54%)	0.006	12 (20%)	18 (42%)	0.02
Microbiological							
Positive blood cultures	79 (76%)	61 (74%)	18 (81%)	0.84	48 (79%)	31 (72%)	0.41
S bovis	10 (10%)	9 (11%)	1 (5%)	0.56	8 (13%)	2 (5%)	0.35
Enterococci	12 (12%)	9 (11%)	3 (14%)	0.95	7 (11%)	5 (11%)	0.95
S viridans	12 (12%)	12 (15%)	0	0.11	11 (18%)	1 (2%)	0.01
All staphylococci	25 (24%)	13 (16%)	12 (54%)	<0.001	10 (17%)	15 (35%)	0.07
S aureus	21 (20%)	10 (12%)	11 (50%)	0.001	7 (11%)	14 (32%)	0.02
Q fever	2 (2%)	2 (3%)	0	1	2 (3%)	0	0.61
Candida species	3 (3%)	3 (4%)	0	0.81	1 (2%)	2 (5%)	0.79
HACEK	2 (2%)	2 (3%)	0	1	2 (3%)	0	0.61
Complications							
Embolic event	35 (33%)	26 (32%)	9 (41%)	0.58	20 (32%)	15 (35%)	0.95
Cerebral haemorrhage	5 (5%)	2 (3%)	3 (14%)	0.12	2 (3%)	3 (7%)	0.73
Severe heart failure	32 (31%)	18 (22%)	14 (64%)	0.001	10 (16%)	22 (51%)	<0.001
High level conduction abnormality	6 (6%)	4 (5%)	2 (9%)	0.87	4 (6%)	2 (5%)	0.96
Any complication	69 (66%)	49 (60%)	20 (90%)	0.05	35 (57%)	34 (79%)	0.05
Early surgery (< 30 days)	51 (49%)	42 (51%)	9 (41%)	0.8	31 (51%)	20 (46%)	0.79

Prosthetic valve endocarditis: who needs surgery? A multicentre study of 104 cases

G Habib et al, Heart 2005

Criterio mayor de Duke para endocarditis en 104 pacientes

	All patients (n = 104)	Early group (n = 20)	Late group (n = 84)	p Value
Positive echocardiogram	97 (93%)	19 (95%)	78 (93%)	0.7
Vegetation	64 (61%)	14 (70%)	50 (60%)	0.42
Abscess	53 (51%)	13 (65%)	40 (48%)	0.17
New prosthetic valve dehiscence	31 (30%)	6 (30%)	25 (30%)	0.99
Positive blood culture	79 (76%)	14 (70%)	65 (78%)	0.62
All streptococci	34 (33%)	2 (10%)	32 (38%)	0.015
Streptococcus bovis	10 (10%)	1 (5%)	9 (11%)	0.71
Enterococci	12 (12%)	0	12 (14%)	0.15
Streptococcus viridans	12 (12%)	1 (5%)	11 (13%)	0.52
All staphylococci	25 (24%)	8 (40%)	17 (20%)	0.12
Staphylococcus aureus	21 (20%)	7 (35%)	14 (17%)	0.13
Others (coagulase negative)	4 (4%)	1 (5%)	3 (4%)	1
Others				
Q fever	2 (2%)	0	2 (2%)	0.48
Candida species	3 (3%)	0	3 (4%)	0.9
HACEK	2 (2%)	0	2 (2%)	1
Others	13 (12%)	4 (20%)	9 (11%)	0.7

HACEK, *Haemophilus* species, *Actinobacillus* species, *Cardiobacterium hominis*, *Eikenella corrodens*, *Kingella kingae*.

Prosthetic valve endocarditis: who needs surgery? A multicentre study of 104 cases

G Habib et al, Heart 2005

	All patients (n = 104)	Early group (n = 20)	Late group (n = 84)	p Value
Embolic events	35 (33%)	6 (30%)	29 (35%)	0.67
Cerebral haemorrhage	5 (5%)	2 (10%)	3 (4%)	0.51
Severe heart failure	32 (31%)	7 (35%)	25 (30%)	0.65
High level conduction abnormality	6 (6%)	1 (5%)	5 (6%)	1
Surgery (active phase <30 days)	51 (49%)	16 (80%)	35 (41%)	0.001
In-hospital mortality	22 (21%)	6 (30%)	16 (19%)	0.43
After surgery in active phase	9 (17%)	5 (31%)	4 (11%)	0.16
After medical treatment in active phase	13(25%)	1 (25%)	12 (25%)	1
Late mortality	21/82 (26%)	7 (50%)	14 (20%)	0.07
Cumulated long term mortality	43 (41%)	13 (65%)	30 (36%)	0.01
Relapse and reinfections	5 (5%)	1 (6%)	4 (5%)	1

Multivariate analysis: predictors of mortality among 104 patients with PVE

G Habib et al, Heart 2005

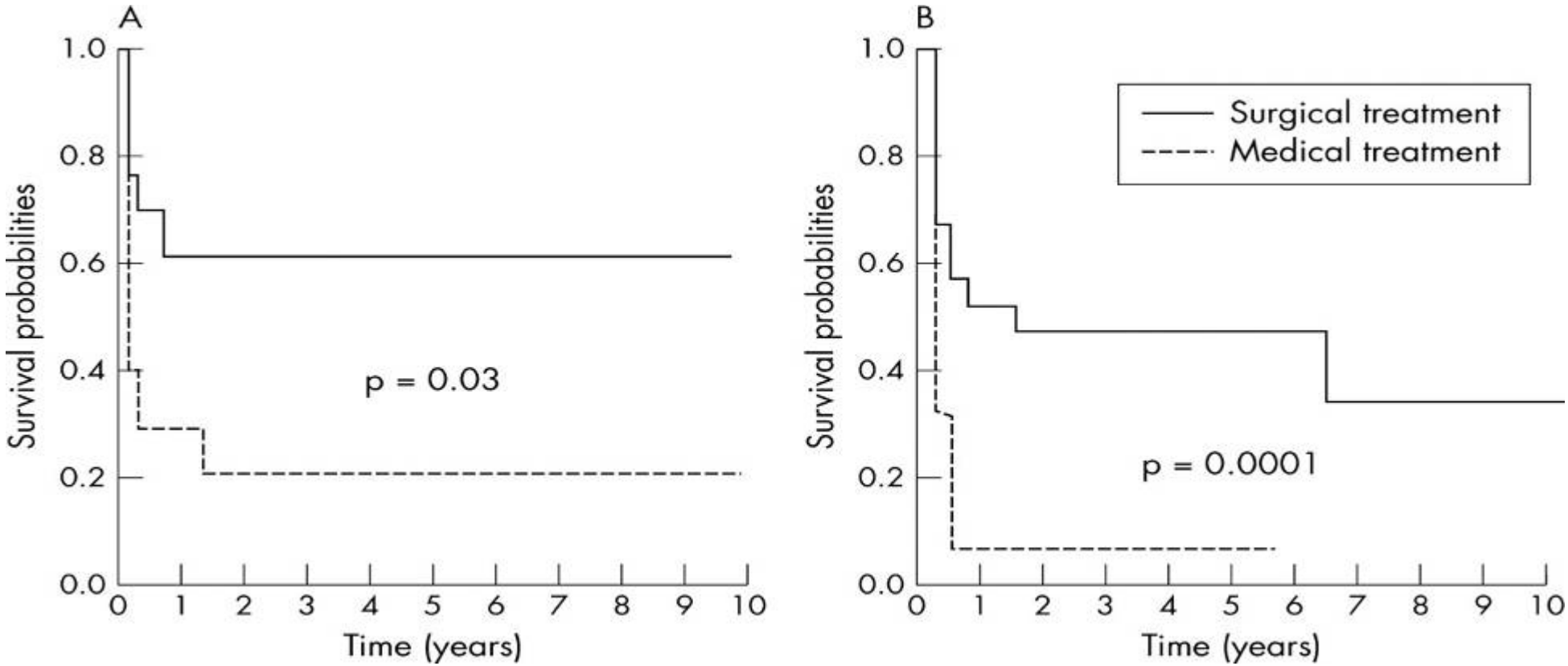
	Logistic regression analysis		
Predictors of in-hospital mortality	p Value	Adjusted OR	95% CI
Severe heart failure	0.002	5.5	1.9 to 16.1
S aureus	0.002	6.1	1.9 to 19.2

	Cox proportional hazards model		
Predictors of long term mortality	RR	95% CI	p Value
Early PVE	2.14	1.08 to 4.25	0.03
Co-morbidity	3	1.36 to 6.61	0.006
Severe heart failure	4.19	2.18 to 8.03	<0.0001
Staphylococcus infection	2.01	1.01 to 4.02	0.007
New prosthetic dehiscence	2.43	1.27 to 4.65	0.007

CI, confidence interval; OR, odds ratio; RR, risk ratio.

Long term survival of patients with (A) staphylococcal prosthetic valve endocarditis (PVE) and (B) complicated PVE treated either with medically or surgically.

G Habib et al, Heart 2005



Prognostic Factors in 61 Cases of *Staphylococcus aureus* Prosthetic Valve Infective Endocarditis from the International Collaboration on Endocarditis.

Chirouze C et al, CID 2004

	No. (%) of patients, by study site							
Site	Philadelphia (*n* = 5)	Marseilles (*n* = 4)	Sweden (*n* = 13)	Durham (*n* = 4)	Nancy/Besançon (*n* = 9)	Barcelona (*n* = 7)	London (*n* = 19)	Total (*n* = 61
Age >60 years	1 (20.0)	1 (33.3)[a]	8 (61.5)	1 (25.0)	4 (44.4)	4 (57.1)	10 (52.6)	30 (50.0
Male sex	4 (80.0)	2 (50.0)	8 (61.5)	3 (75.0)	6 (66.7)	5 (71.4)	9 (47.4)	37 (60.7
Comorbidity	1 (20.0)	1 (25.0)	...	...	...	3 (42.9)	3 (15.8)	8 (13.1
Early valve surgery	3 (60.0)	1 (25.0)	3 (23.1)	0	3 (33.3)	3 (42.9)	8 (42.1)	21 (34.4
In-hospital death	1 (20.0)	1 (25.0)	1 (7.7)	2 (50.0)	6 (66.7)	5 (71.4)	13 (68.4)	29 (47.5

Prognostic Factors in 61 Cases of *Staphylococcus aureus* Prosthetic Valve Infective Endocarditis from the International Collaboration on Endocarditis.

Chirouze C et al, CID 2004

Mortality in 4 subgroups of patients, according to the presence of cardiac complications and the perfomance of an early valve replacement

Patient subgroup	Cardiac complication[a]	Early valve replacement	Mortality[b]	*P*
1	Yes	Yes	4/14 (28.6)	.09
2	Yes	No	8/15 (53.3)	
3	No	No	11/25 (44)	
4	No	Yes	6/7 (85.7)	

[a] Cardiac complication is defined as congestive heart failure and/or intracardiac abscess.

[b] Data are no. of patients who died/no. of patients in the subgroup (%).

Only variable that tended to be prognostic significance was **stroke**, which was associated with a higher risk of death (OR, 3,04; 95% CI, 0,8-11,6: *P*=.09)

Coagulase- negative staphylococcal prosthetic valve endocarditis-a contemporary update based on the International Collaboration on Endocarditis: prospective cohort study.

Clinical characteristics and outcomes of coagulase-negative staphylococcal (CoNS) prosthetic valve endocarditis compared to *S aureus* and *viridans* group streptococcal (VGS) prosthetic valve endocarditis

	CoNS (n = 86)	S aureus (n = 122)	VGS (n = 66)	p Value CoNS vs S aureus	p Value CoNS vs VGS
Age median (25th–75th percentile) (years)	62 (50–71)	63 (49–74)	57 (46–72)	0.23	0.54
Gender, male	59 (69%)	79 (65%)	42 (64%)	0.23	0.33
Duration of symptoms >1 month before presentation	16 (19%)	7 (5.7%)	13 (20%)	<0.01	0.28
Speciation of CoNS					
S epidermidis	49/60 (82%)				
Non-*epidermidis* CoNS	11/60 (18%)				
Comorbid conditions					
Haemodialysis	6 (7.0%)	12 (9.8%)	2 (3.0%)	0.76	0.14
Diabetes mellitus	15 (17%)	23 (19%)	12 (18%)	0.30	0.16
Other chronic illness	37 (43%)	59 (48%)	30 (45%)	0.13	0.69
Previous IE episode	14 (16%)	17 (14%)	19 (29%)	0.60	0.02
Echocardiographic findings					
TTE evidence of IE	37 (52%)	30 (32%)	21 (44%)	<0.01	0.12
TEE evidence of IE	63 (91%)	90 (87%)	52 (88%)	0.27	0.11
Intracardiac vegetations	70 (81%)	97 (80%)	40 (61%)	0.50	<0.01
Aortic	33 (47%)	51 (53%)	21 (52%)	0.88	0.73
Mitral	41 (59%)	53 (55%)	22 (55%)	0.79	0.76
Tricuspid	2 (2.9%)	4 (4.1%)	0	0.97	0.42
Pulmonic	0	0	1 (2.5%)		
PV dehiscence	15 (17%)	12 (10%)	9 (14%)	0.21	0.52
PV new regurgitation	23 (27%)	23 (19%)	13 (20%)	0.48	0.19

V H Chu et al Heart 2009

Coagulase- negative staphylococcal prosthetic valve endocarditis-a contemporary update based on the International Collaboration on Endocarditis: prospective cohort study

Clinical characteristics and outcomes of coagulase-negative staphylococcal (CoNS) prosthetic valve endocarditis compared to *S aureus* and *viridans* group streptococcal (VGS) prosthetic valve endocarditis

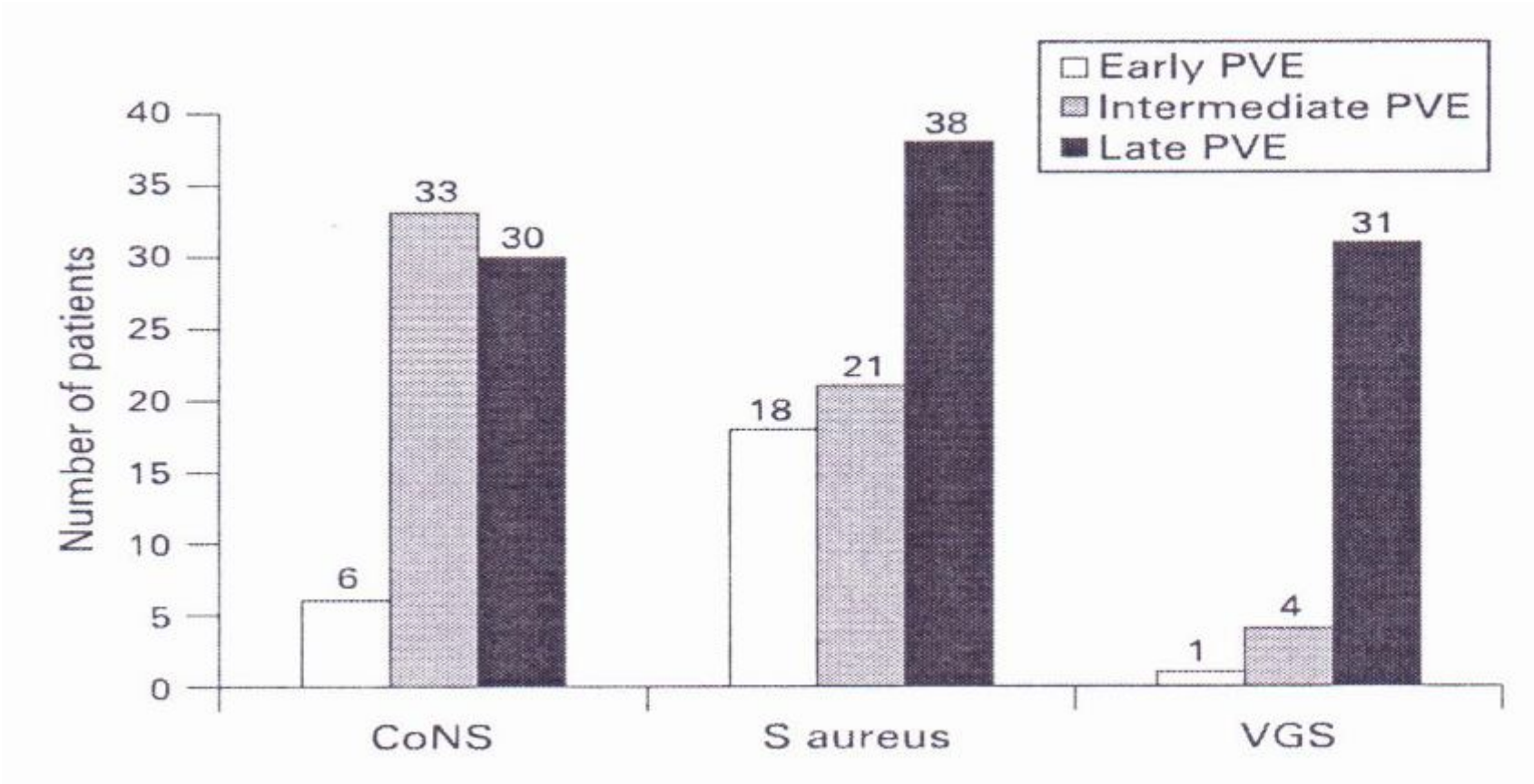
	CoNS (n = 86)	S aureus (n = 122)	VGS (n = 66)	p Value CoNS vs S aureus	p Value CoNS vs VGS
Antibiotic resistance*					
Meticillin-resistant	49/72 (68%)	35/112 (31%)			
Aminoglycoside-resistant	12/55 (14%)	11/83 (9.0%)			
Main antibiotic therapy					
Penicillinase-resistant penicillin	19 (22%)	62 (51%)	1 (1.5%)		
Vancomycin	62 (72%)	52 (42%)	7 (11%)		
Surgery this episode	49 (57%)	55 (45%)	29 (44%)	0.06	0.11
Complications/outcomes					
Stroke	13 (15%)	36 (30%)	9 (14%)	0.02	0.92
Congestive heart failure	34 (40%)	38 (31%)	23 (35%)	0.21	0.87
Intracardiac abscess	33 (38%)	28 (23%)	13 (20%)	0.03	0.05
New conduction abnormality	10 (12%)	15 (12%)	4 (6.1%)	0.74	0.26
Systemic embolisation	15 (17%)	16 (13%)	4 (6.1%)	0.94	0.14
In-hospital death	21 (24%)	44 (36%)	6 (9.1%)	0.09	0.08

*Shown as fraction of patients for whom antibiotic resistance data are available.
CoNS, coagulase-negative staphylococcus; IE, infective endocarditis; PV, prosthetic valve; TEE, transoesophageal echocardiogram; TTE, transthoracic echocardiogram; VGS, *viridans* group streptococcus.

V H Chu et al Heart 2009

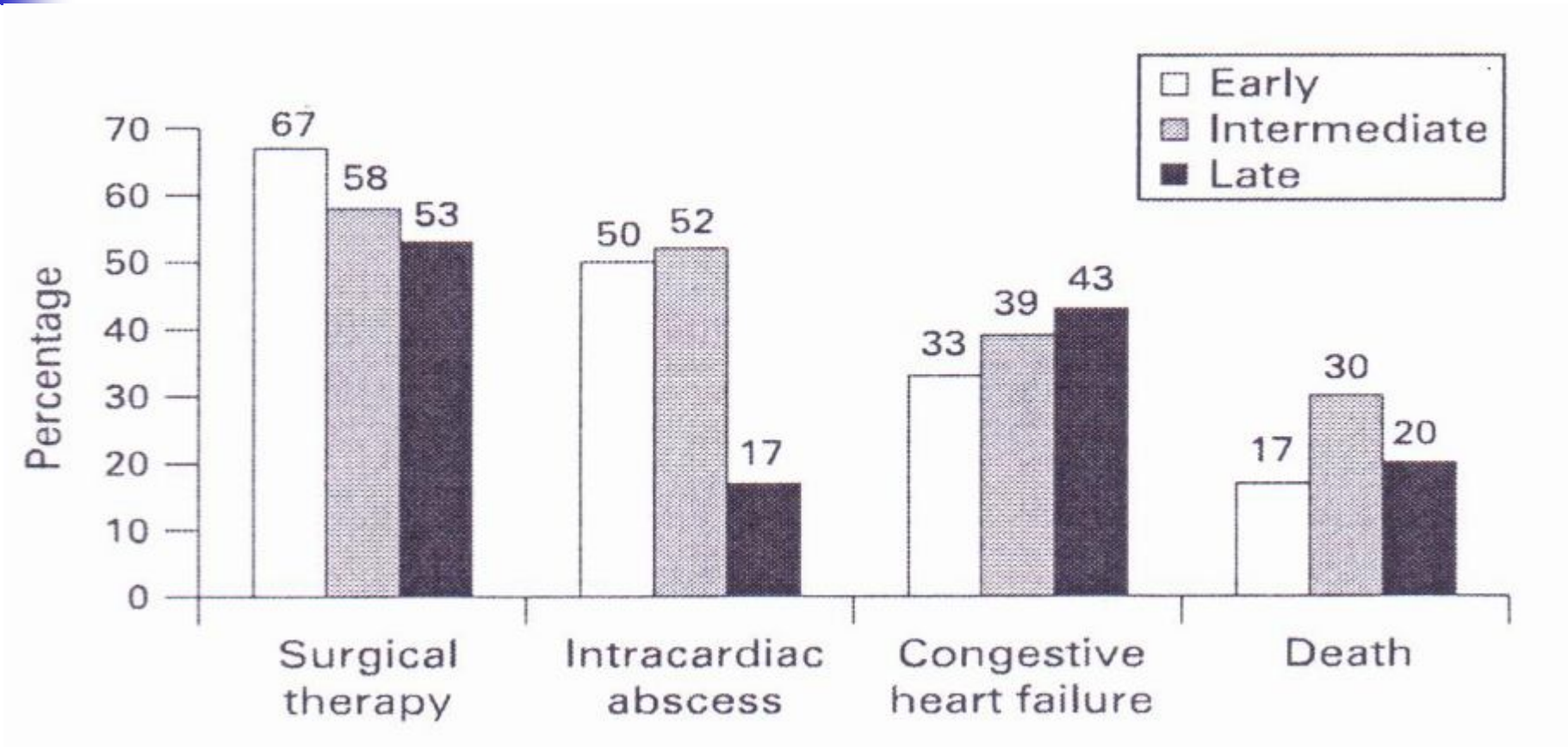
Distribution of endocarditis cases according to time since prosthetic valve implantation.
International Collaboration on Endocarditis.

V H Chu Heart 2009



Outcomes of coagulase-negative staphylococcal prosthetic valve endocarditis according to time since prosthetic valve implantation

V H Chu Heart 2009



Bivariable analysis of in-hospital mortality among 86 patients with coagulase-negative staphylococcal prosthetic valve endocarditis

V H Chu, Heart 2009

	Bivariable analysis	
	Unadjusted OR (95% CI)	p Value
Age in 10-year intervals	2.1 (1.2 to 3.7)	0.01
Gender, male	0.4 (0.1 to 1.1)	0.09
Time from prosthetic valve insertion to IE admit ⩽365 days	1.7 (0.5 to 6.3)	0.39
Duration of symptoms >1 month before presentation	0.7 (0.2 to 2.4)	0.51
Comorbid conditions/risk factors		
Diabetes	2.5 (0.7 to 8.5)	0.14
Other chronic illness	1.0 (0.4 to 2.1)	0.94
History of previous episode of IE	1.5 (0.4 to 5.7)	0.58
Cardiac surgery this episode	0.5 (0.1 to 1.6)	0.21
PV dehiscence	1.1 (0.3 to 4.1)	0.82
PV new regurgitation	2.7 (0.9 to 7.8)	0.06
Complications		
Stroke	0.5 (0.1 to 1.9)	0.30
Congestive heart failure	2.0 (0.7 to 5.5)	0.18
Intracardiac abscess	2.7 (0.7 to 11)	0.16
New conduction abnormality	1.5 (0.4 to 5.9)	0.57
Systemic embolisation other than stroke	1.5 (0.4 to 4.9)	0.54

Contemporary Clinical Profile and Outcome of Prosthetic Valve Endocarditis

A Wang et al, JAMA 2007

Comparison of Patients With Prosthetic Valve Endocarditis (PVE) and Native Valve Infective Endocarditis (NVIE) in the International Collaboration on Endocarditis-Prospective Cohort Study

Characteristic	PVE (n = 556)	NVIE (n = 1895)	*P* Value
Age, mean (range), y	65.0 (49.9-74.3)	56.3 (41.1-69.9)	<.001
Male	363 (65.3)	1299 (68.6)	.17
Hemodialysis dependent	25 (4.5)	173 (9.1)	<.001
Diabetes mellitus	100 (18.0)	292 (15.4)	.13
Current injection drug use	10 (1.8)	235 (12.4)	<.001
Chronic immunosuppressive therapy	24 (4.3)	127 (6.7)	.05
Cancer	32 (5.8)	169 (8.9)	.02
Other chronic illness	246 (44.2)	916 (48.3)	.12
Previous endocarditis	112 (20.1)	91 (4.8)	<.001
Health care–associated infection	203 (36.5)	587 (31.0)	.01
Transesophageal echocardiography performed	467 (84.0)	1290 (68.1)	<.001
Time from admission to transesophageal echocardiography, mean (range), d	2.0 (0-6.0)	3.0 (0-7.0)	.13
Echocardiographic findings			
Vegetation	406 (73.0)	1703 (89.9)	<.001
New regurgitation	257 (46.2)	1346 (71.0)	<.001
Abscess	165 (29.7)	222 (11.7)	<.001
Complications and outcome			
Heart failure	183 (32.9)	616 (32.5)	.90
Stroke	101 (18.2)	322 (17.0)	.55
Other systemic embolization	83 (14.9)	468 (24.7)	<.001
Surgery during admission	272 (48.9)	879 (46.4)	.30
Persistent bacteremia	49 (8.8)	166 (8.8)	.92
Duration of hospitalization, mean (range), d	33 (19-49)	29 (16-44)	<.001
In-hospital death	127 (22.8)	310 (16.4)	<.001

*Data are presented as number and percentage unless otherwise indicated.

Contemporary Clinical Profile and Outcome of Prosthetic Valve Endocarditis

A Wang et al, JAMA 2007

Causative Organisms for Total Cohort, Early and Late PVE

Causative Organism	Total, No. (%) (n = 556)	Early PVE, No. (%) (n = 53)	Late PVE, No. (%) (n = 331)
Staphylococcus aureus	128 (23.0)	19 (35.9)	61 (18.4)
Methicillin-sensitive *S aureus*	82 (14.7)	8 (15.1)	43 (13.0)
Methicillin-resistant *S aureus*	36 (6.5)	10 (18.9)	11 (3.3)
Coagulase-negative staphylococci	94 (16.9)	9 (17.0)	66 (19.9)
Enterococcus spp	71 (12.8)	4 (7.5)	42 (12.7)
Viridans streptococci	67 (12.1)	1 (1.9)	34 (10.3)
Culture negative	62 (11.2)	9 (17.0)	41 (12.4)
Streptococcus bovis	29 (5.2)	1 (1.9)	22 (6.7)
Fungal	23 (4.1)	5 (9.4)	11 (3.3)
Polymicrobial	10 (1.8)	0	6 (1.8)
HACEK spp*	8 (1.4)	0	7 (2.1)
Escherichia coli	7 (1.3)	1 (1.9)	3 (0.9)
Streptococcus agalactiae	5 (0.9)	0	3 (0.9)
Propionibacterium acnes	4 (0.7)	0	3 (0.9)
Streptococcus group G	4 (0.7)	0	3 (0.9)
Propionibacterium NOS	3 (0.5)	0	2 (0.6)
Pseudomonas aeruginosa	3 (0.5)	1 (1.9)	1 (0.3)
Streptococcus anginosus	3 (0.5)	0	2 (0.6)
Streptococcus NOS	3 (0.5)	0	2 (0.6)
Streptococcus pneumoniae	3 (0.5)	0	3 (0.9)
Listeria monocytogenes	2 (0.4)	0	2 (0.6)
Micromonas micros	2 (0.4)	0	2 (0.6)
Mycobacteria spp	2 (0.4)	0	1 (0.3)
Serratia marcescens	2 (0.4)	1 (1.9)	0
Streptococcus gallolyticus	2 (0.4)	0	0
Streptococcus group B	2 (0.4)	0	0
Streptococcus group C	2 (0.4)	0	1 (0.3)

Regional comparison of Clinical Characteristics of Prosthetic Valve Endocarditis (PVE)

	Overall	United States	South America	Australia/ New Zealand/ Asia	North/Central Europe	Southern Europe/ Middle East/ South Africa	*P* Value
No. of sites	53	10	7	11	14	11	
No. of PVE cases	556	116	66	120	109	145	
PVE per total infective endocarditis cases reported, %	20.1	20.9	11.9	21.6	19.6	26.1	
Early PVE, %	13.8	21.1	10.3	11.7	12.7	13.0	.38
Health care–associated infection	203 (36.5)	52 (44.8)	22 (33.3)	38 (31.7)	45 (41.3)	46 (31.7)	.11
Non-nosocomial health care–associated infection	62 (11.2)	25 (21.6)	5 (7.6)	12 (10.0)	11 (10.1)	9 (6.2)	.002
Presumed intravascular device source	87 (15.7)	32 (27.6)	5 (7.6)	11 (9.2)	17 (15.6)	22 (15.2)	<.001
Hemodialysis	25 (4.5)	15 (12.9)	2 (3.0)	2 (1.7)	3 (2.8)	3 (2.1)	<.001
Staphylococcus aureus	128 (23.0)	38 (32.8)	7 (10.6)	28 (23.3)	30 (27.5)	25 (17.3)	.003
Coagulase-negative staphylococci	94 (16.9)	20 (17.2)	7 (10.6)	14 (11.7)	17 (15.6)	36 (24.8)	.03
Persistent bacteremia	49 (8.8)	22 (19.0)	3 (4.6)	7 (5.8)	7 (6.4)	10 (6.9)	<.001
Congestive heart failure	183 (32.9)	53 (45.7)	27 (40.9)	23 (19.2)	30 (27.5)	50 (34.5)	<.001
In-hospital mortality	127 (22.8)	21 (18.1)	16 (24.2)	21 (17.5)	27 (24.8)	42 (29.0)	.13

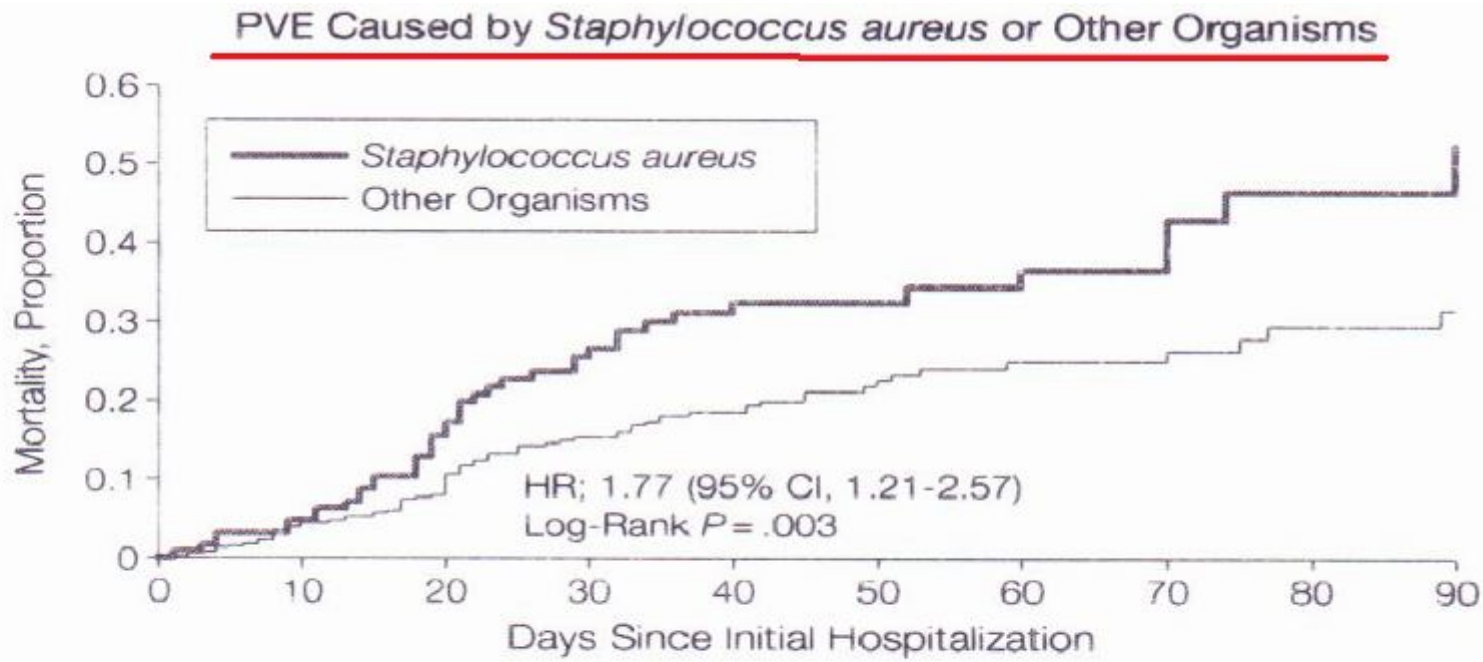
Wang A, etr al, JAMA 2007

Relationship Between Prosthetic Valve Endocarditis Characteristics and in-Hospital Mortality

A Wang et al, JAMA 2007

Variable	No.	In-Hospital Mortality, No. (%)	Odds Ratio (95% CI) Unadjusted	Odds Ratio (95% CI) Adjusted
Age, y				
<65	277	42 (15.2)	1 [Reference]	1 [Reference]
65-75	151	38 (25.2)	1.71 (1.01-2.90)	1.82 (1.09-3.03)
>75	128	47 (36.7)	3.10 (1.80-5.32)	3.73 (2.10-6.61)
Male	363	76 (20.9)	0.73 (0.47-1.12)	
Diabetes mellitus	100	28 (28.0)	1.40 (0.92-2.13)	
Prior infective endocarditis	112	21 (18.8)	0.74 (0.49-1.12)	
Hemodialysis	25	10 (40.0)	2.31 (1.12-4.77)	
Presumed intravascular device source	87	30 (34.5)	1.86 (1.03-3.38)	
Health care–associated infection	203	62 (30.5)	1.83 (1.22-2.74)	1.62 (1.08-2.44)
Staphylococcus aureus	128	44 (34.4)	2.12 (1.25-3.60)	1.73 (1.01-2.95)
Coagulase-negative staphylococci	94	24 (25.5)	1.13 (0.81-1.58)	
Mitral valve prosthesis	280	64 (22.9)	0.98 (0.70-1.38)	
Time since valve implantation in 30-d intervals			1.00 (0.99-1.01)	
Persistent bacteremia	49	27 (55.1)	1.67 (1.07-2.27)	4.29 (1.99-9.22)
Congestive heart failure	183	60 (32.8)	2.29 (1.59-3.32)	2.33 (1.62-3.34)
Intracardiac abscess	144	47 (32.6)	2.10 (1.22-3.60)	1.86 (1.10-3.15)
Stroke	101	34 (33.7)	2.10 (1.25-3.53)	2.25 (1.25-4.03)

In-hospital Mortality as a Function of Causative Organism

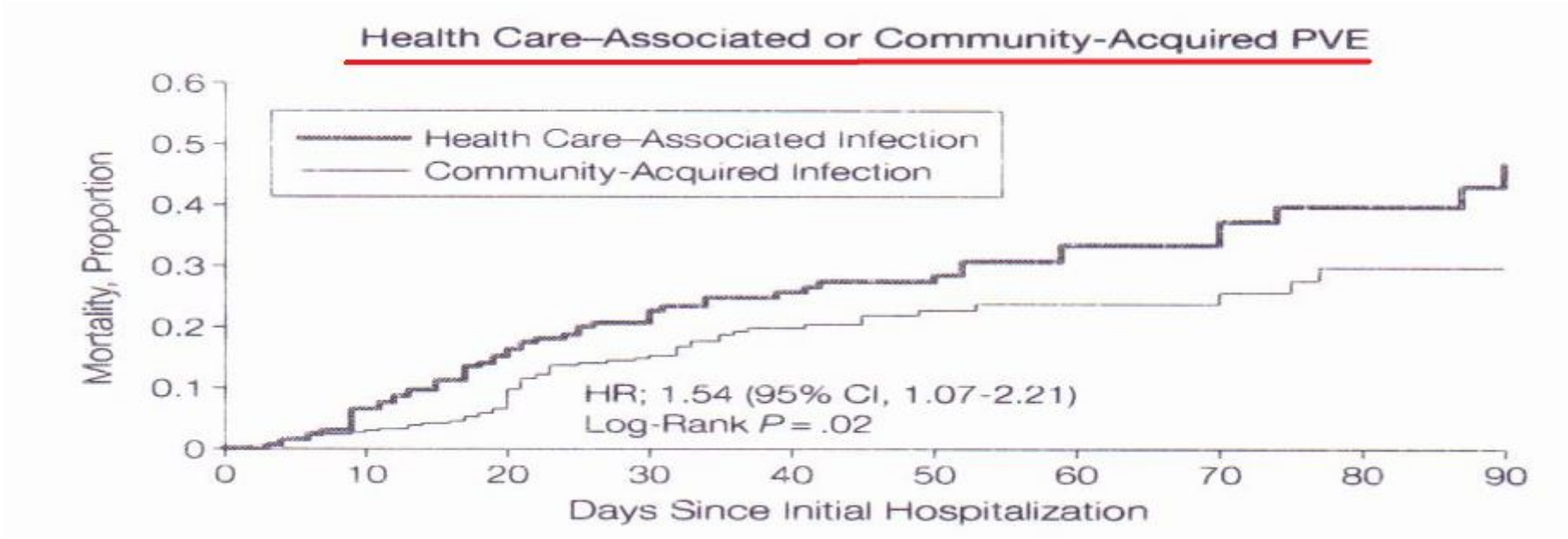


No. at Risk

Staphylococcus aureus	128	120	98	73	53	39	29	20	9	8
Other Organisms	417	388	316	238	175	110	78	56	41	30

Wang a et al, JAMA 2007

In-hospital Mortality as a Function of Health Care-Associated Infection and Community-Acquired Infection PVE



No. at Risk										
Health Care–Associated Infection	199	183	147	114	87	67	49	34	22	14
Community-Acquired Infection	346	325	267	197	141	82	58	42	28	24

Wang A et al, JAMA 2007

Medical Versus Surgical Management of *Staphylococcus aureus* Prosthetic Valve Endocarditis

- Identificar los factores pronósticos asociados con mortalidad en EVP por *S. aureus*
- Estudio retrospectivo.Criterios de ASA de severidad
- 55 pacientes (criterio Duke).Tratamiento → Médico 23 | Cirugía 32

Mortalidad media 36% (28% grupo cirugía, 48% médico)

- **Factores de riesgo significativos de mortalidad :**

  Score ASA IV, edad avanzada y válvulas bioprotésicas

Cirugía puede no ser precisa →

- menores de 50 años
- clínicamente estables
- sin complicación cardiaca
- no complicación SNC

Sohail MR et al, Am J Med 2006

Definition, clinical profile, microbiological spectrum, and prognostic factors of early-onset prosthetic valve endocarditis Javier Lopez et al, Eur Heart J, 2007

- Comparan perfíl microbiológico de 172 pacientes no-ADVP con EVP en 640 EI diagnosticadas entre 1996-2004
- 66 (63 definidas y 3 posibles) adquiridas en el primer año
- No diferencias en etiología entre los 2 primeros meses de la sustitución valvular y entre 2-12 meses.
- **Proporción de SCN más alta en el primer año poscirugía (37 vs. 18%, *P*=0,005)**
- ***Streptococci viridans* más común después del primer año (18 vs 1%, *P*=0,001)**
- Porcentaje de SCN methicilin-resistente más alto en el primer año (77 vs. 30%, *P*=0,004)
- EVP precoz representó el 38% de todas EVP

Definition, clinical profile, microbiological spectrum, and prognostic factors of early-onset prosthetic valve endocarditis

Javier Lopez et al, Eur Heart J, 2007

Espectro microbiológico en 66 pacientes con EVP precoz

Infective microorganism	EO-PVE
Coagulase-negative *Staphylococci*	26 (37%)
Staphylococcus aureus	17 (24%)
Enterococci	5 (7%)
Gram negative bacilli	4 (6%)
Fungi	3 (4%)
Anaerobes	3 (4%)
Streptococus bovis	1 (1%)
Streptococci viridans	1 (1%)
Other *Streptococci*	0 (0%)
Negative cultures	11 (16%)

Definition, clinical profile, microbiological spectrum, and prognostic factors of early-onset prosthetic valve endocarditis

- **Precisaron cirugía urgente 46 %**
- **Cirugía programada 25 %**
- **Mortalidad hospitalaria 38 %**
- No DS entre grupo médico y quirúrgico (32 vs. 45%, *P*= 0,30)

Las complicaciones perianulares se asociaron con mayor mortalidad hospitalaria (60 vs. 27%, *P*=0,007)

Javier Lopezet al, Eur Heart J, 2007

Comparativa entre vivos y muertos de pacientes con Endocarditis en válvula protésica en la base GAMES. (N: 277 pacientes)

	Alive N=105	Death N=172	
Presentation (%)			
Fever >38°C	140 (81.3)	96 (91.4)	.027
Vascular phenomena	5 (2.9)	8 (7.6)	.060
New murmur	32 (18.6)	28 (26.6)	.041
Mean CRP	48.6	47.2	.558
Elevated RF	15 (8.7)	5 (4.7)	.530
Proven endocarditis	137 (79.6)	95 (90.4)	.010
Possible endocarditis	35 (20.3)	9 (8.5)	.010
Etiology (%)			
S. aureus	14 (8.1)	27 (25.7)	<0.01
CNS	54 (31.3)	36 (34.2)	.618
Streptococcus spp.	30 (17.4)	13 (12.3)	.259
Enterococcus spp.	29 (16.8)	14 (13.3)	.432
Negative blood cultures	17 (9.8)	6 (5.7)	.222
Intracardiac complication (%)	127 (73.8)	48 (45.7)	<0.01
Transesophageal echocardiogram (%)	157 (91.2)	88 (83.8)	.059
Transthoracic echocardiogram (%)	152 (88.3)	98 (93.3)	.177

Comparativa entre vivos y muertos de pacientes con Endocarditis en válvula protésica en la base GAMES. (N: 277 pacientes)

	Alive N=172	Death N=105	p
Mean age (IQR)	65.5 (51.5-79.5)	68.8 (56-81.6)	.457
Male (%)	117(68)	68(64.7)	.576
Underlying condition (%)			
heart failure	68 (39.5)	48 (45.7)	.251
previous cardiac surgery	163 (94.7)	104 (99)	.129
diabetes mellitus	**42 (24.4)**	**28 (26.6)**	.676
renal insufficiency	**36 (20.9)**	**37 (35.2)**	.033
atrial fibrillation	**74 (43)**	**45 (42.8)**	.969
lung disease	26 (15.1)	23 (21.9)	.148
Neoplasia	23 (13.3)	20 (19)	.206
HIV infection	1 (0.5)	1 (0.9)	.734
Previous IE	21 (12.2)	11 (10.4)	.662
Charlson-age comorbidity	4	5.1	.022
Affected valve (%)			.274
Aortic	**100 (58.1)**	**68 (64.7)**	.661
Mitral	**80 (46.5)**	**46 (43.8)**	.267
Tricuspid	2 (1.1)	-	.616
Pulmonary	2 (1.1)	2 (1.9)	
Nosocomial (%)	**63 (36.6)**	**54 (51.4)**	.026
Community acquired (%)	**90 (52.3)**	**43 (40.9)**	.026

Comparativa entre vivos y muertos de pacientes con Endocarditis en válvula protésica en la base GAMES. (N: 277 pacientes)

	Alive N=105	Death N=172	
Clinical course (%)			
Embolisms	45 (26.1)	35 (33.3)	.162
Spleen enlargement	15 (8.7)	14 (13.3)	.172
Heart failure	52 (30.2)	66 (62.8)	<0.01
Persistent bacteremia (%)	10 (5.8)	16 (15.2)	.005
Heart surgery (%)			
Indicated	99 (57.5)	94 (89.5)	<0.01
Operated on	70 (40.6)	52 (49.5)	.151
Reasons for surgery (%)			
Myocardical invasion	8 (4.6)	16 (15.2)	.005
Early prosthetic IE	24 (13.9)	20 (19)	.398
Late prosthetic IE	16 (9.3)	16 (15.2)	.206
Septic persistence	3 (1.7)	8 (7.6)	.022
Median hospital stay	44	22.5	.002

Complicaciones y hallazgos ecográficos en válvula protésica en la base GAMES. (N: 277 pacientes)

Variables de estudio (%)	Casos (N:277)	p
Complicaciones Intracardiacas		
Perforación-rotura	4 (1,4)	<0.01
válvula mitral	1 (0,3)	
raíz aórtica	3 (1)	
Pseudoaneurisma	**17 (6,1)**	.050
válvula mitral	2 (0,7)	
raíz aórtica	15 (5,4)	
Absceso	**84 (30,3)**	<0.01
válvula mitral	17 (6,1)	
raíz aórtica	66 (23,8)	
Fístula Intracardiaca	15 (5,4)	0.01
Complicaciones paravalvulares		
Dehiscencia	**83 (29,9)**	<0.01
Regurgitación paravalvular	**78 (28,1)**	<0.01
Otros Hallazgos		
Fracción de Eyección Estimativa		.024
normal	206 (74,3)	
deprimida	53 (19,1)	
Media de PSAP	46.09	.037
Derrame pericárdico	**14 (5)**	.503

Curso clínico de los pacientes con endocarditis protésica en la base GAMES. (N: 277 pacientes)

Variables de estudio (%)	Casos(N:277)	p
Fallo cardiaco	**119 (42,9)**	0,476
Infarto de Miocardio	10 (3,6)	0,333
Evidencia de aneurisma micótico	8 (2,8)	0,709
Bacteriemia persistente	26 (9,3)	0,457
Evento vascular en SNC	**66 (23,8)**	0,097
Embolización	51 (18,4)	0,330
Embolia recurrente	10 (3,6)	0,612
Anomalía en la conducción	**36 (12,9)**	0,004
Nueva insuficiencia renal	**123 (44,4)**	0,029
Taquicardia vantricular	6 (2,1)	0,486
RCP	21 (7,5)	0,006
Ventilación mecánica	44 (15,8)	0,210
Aporte de aminas	52 (18,7)	0,467
Balón intraaórtico	4 (1,4)	0,241
Angina inestable	0	0,133
Shock séptico	**35 (12,6)**	0,812
Sepsis grave	**53 (19,1)**	0,135
Empeoramiento hepatopatía	8 (2,8)	0,774

Clinical course and predictors of death in prosthetic valve endocarditis over a 20-year period

Hector Alonso-Valle et al, J Thorac Cardiovasc Surg 2010

- Comparan pronóstico de pacientes con EVP precoz y tardía con tratamiento médico o quirúrgico y determinan factores de riesgo de mortalidad hospitalaria
- 133 episodios de EVP en 122 pacientes, enero 1986-diciembre 05
- Resultados :
  - bioprotesis 52% casos, mecánicas 48%
  - válvula aortica 45% pacientes
  - *S. epidermidis* 23% de los casos
  - *Streptococcus* spp 21%
  - *S. aureus* 13%
  - *Enterococcus* 8%
  - Cultivos negativos 18%

Clinical course and predictors of death in prosthetic valve endocarditis over a 20-year period

Hector Alonso-Valle et al, J Thorac Cardiovasc Surg 2010

Tratamiento

Médico 26 pacientes

Antibióticos + sustitución valvular 107

Mortalidad

Intervención 6.5%

Hospitalaria 29%

Predictores S. de Mortalidad Hospitalaria

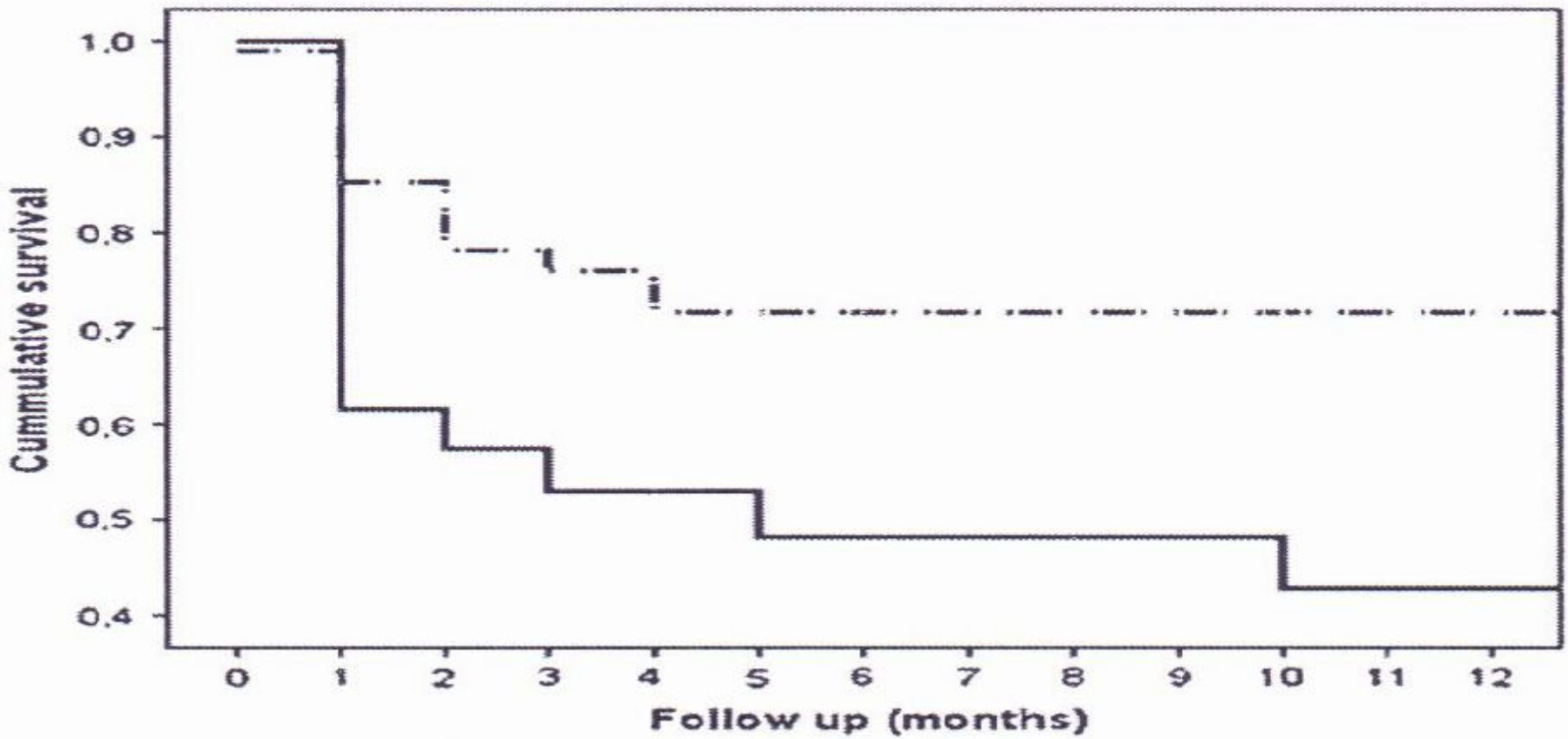
- Absceso en Eco
- Cirugía urgente
- Fallo cardiaco
- Trombocitopenia
- Fallo renal

Supervivencia a los 12 meses (*P*=.0007)

Médico 42%

Cirugía 71%

Long-term survival of patients with prosthetic valve endocarditis after combined medical and surgical treatment *(upper line)* or medical reatment alone *(lower line)*.



Hector Alonso-Valle et al, J Thorac Cardiovasc Surg 2010

Surgical treatment for active infective prosthetic valve endocarditis: 22-year single-centre experience.

M. Musci et al, Eur J Cardiothorac Surg 2010

- Análisis retrospectivo del pronóstico de pacientes con EVP activa que recibieron cirugía en un periodo de 22 años.
- Mayo 1986-Diciembre 2008 se intervinieron 1313 pacientes con EI

EVP 349 (26,6%)

EVP precoz (≤ 60 días) 77 (22,1%),55 v, e.m. 58 a

EVP tardía 277 (77,9%), 200 v, e.m 63 a

- Válvula aortica 80
- Mitral 45
- Doble válvula 39
- Sustitución raiz aorta 165

Absceso perianular desarrollaron 226 (64,8%) pacientes

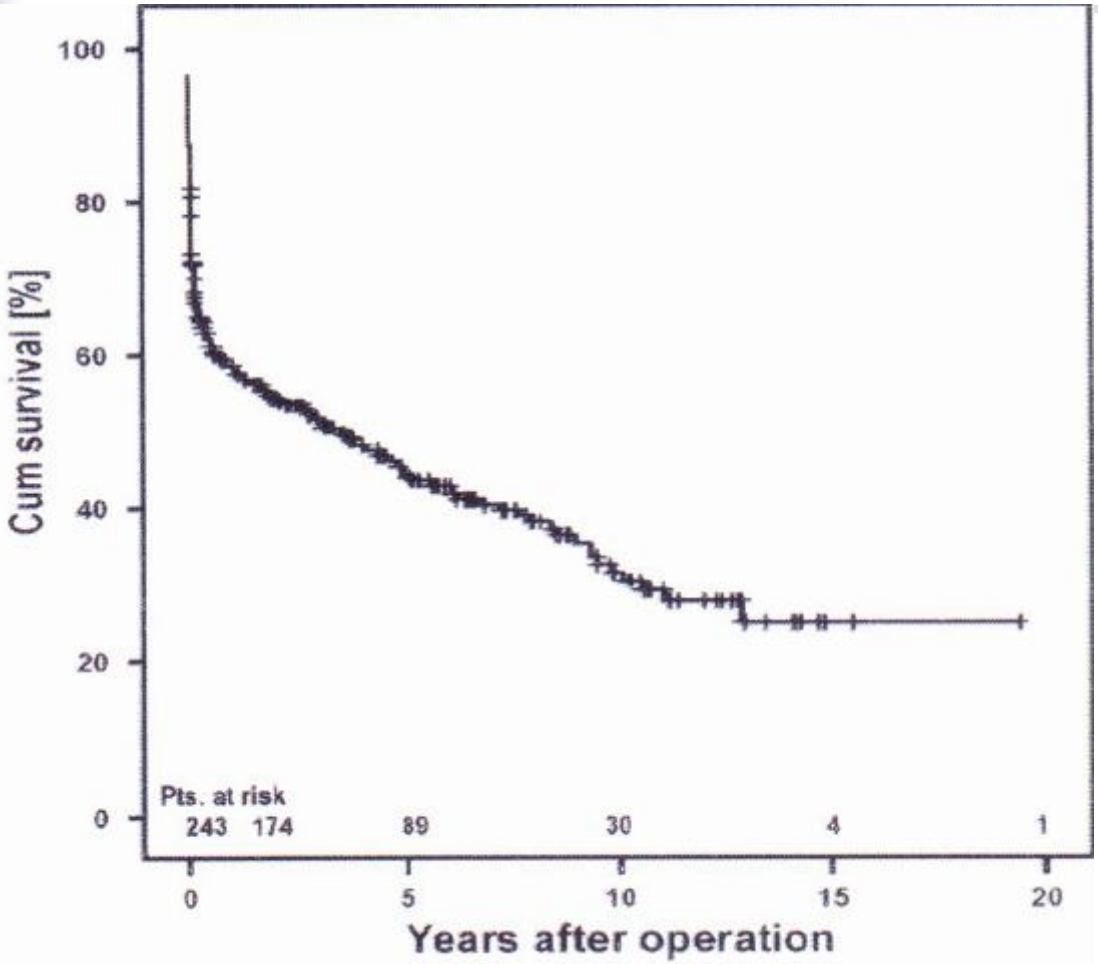
Surgical treatment for active infective prosthetic valve endocarditis: 22-year single-centre experience.

M. Musci et al, Eur J Cardiothorac Surg 2010

	Early PVE n=77 (22.1%)	Late PVE n=272 (77.9%)	P
Staphylococci			
S. aureus	33 (42.9%)	90 (33.1%)	0.113
S. coag. neg.	18 (23.4%)	45 (16.6%)	0.169
S. epidermidis	4 (5.2%)	16 (5.9%)	–
MRSA	7 (9.1%)	14 (5.1%)	–
S. general	2 (2.6%)	3 (1.1%)	–
	2 (2.6%)	12 (4.4%)	–
Streptococci			
Str. general	9 (11.7%)	45 (16.6%)	0.208
Str. viridans	6 (7.8%)	29 (10.7%)	–
Str. β-hemolys.	1 (1.3%)	13 (4.8%)	–
Str. epidermidis	1 (1.3%)	3 (1.1%)	–
	1(1.3%)	–	–
Enterococcus	6 (7.8%)	31 (11.4%)	–
Pseudomonas	1 (1.3%)	2 (0.7%)	–
Candida	–	3 (1.1%)	–
Culture negative	15 (19.5%)	41 (15.1%)	–
Others	3 (3.9%)	9 (3.3%)	–
Unknown	10 (12.9%)	51 (18.7%)	–

Surgical treatment for active infective prosthetic valve endocarditis: 22-year single-centre experience.

M. Musci et al, Eur J Cardiothorac Surg 2010



Supervivencia Media

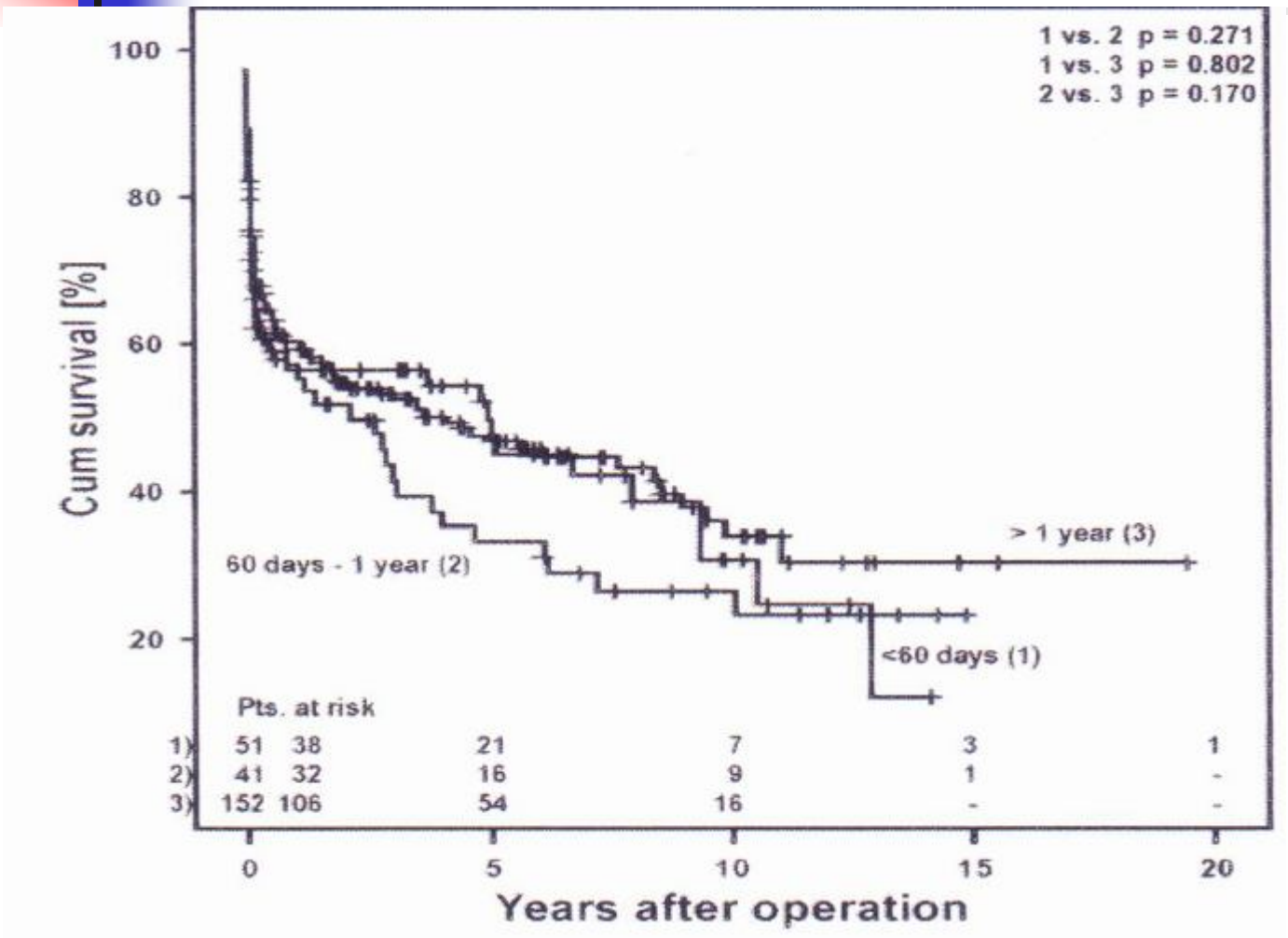
- Día 30 : 71.4 ± 2.4%
- 1 año : 58.7 ± 2.7%
- 5 años : 44.5 ± 3%
- 10 años: 31.7 ± 3.5%

No diferencias significativas entre EVP precoz y tardía

Mortalidad media hospitalaria 28,4% (99/349)

Surgical treatment for active infective prosthetic valve endocarditis: 22-year single-centre experience.

M. Musci et al, Eur J Cardiothorac Surg 2010



Supervivencia

- < 60 días
- 60 días- 1 año
- > 1 año

No diferencias significativas

Risk factors for early mortality (≤ 30 days) in the univariate Cox regresion analysis in PVE

M. Musci et al, Eur J Cardiothorac Surg 2010

Univariate Cox regression	Risk ratio	95% CI	*p*-value
Risk factors			
Mechanical support	5.10	3.73–6.95	≤0.001
Preop. septic shock	3.90	2.66–5.72	≤0.001
Mitral valve abscess	2.92	1.81–4.63	≤0.001
Emergency operation	2.68	1.63–4.41	≤0.001
Preop. catecholamines	2.65	1.96–3.58	≤0.001
Preop. dialysis	2.50	1.71–3.67	≤0.001
Preop. pulmonary oedema	2.47	1.83–3.33	≤0.001
Preop. ventilation	2.23	1.59–3.14	≤0.001
Preop. renal insufficiency	2.21	1.67–2.93	≤0.001
Double valve replacement	1.95	1.31–2.90	0.001

Risk factors for early mortality (≤ 30 days) in the multivariate Cox regresion analysis in PVE

M. Musci et al, Eur J Cardiothorac Surg 2010

Multivariate Cox regression	Risk ratio	95% CI	*p*-value
Risk factors			
Mechanical support	4.3	3.1–5.9	≤0.001
Emergency operation	2.1	1.3–3.5	0.003
Preop. catecholamines	1.8	1.3–2.5	≤0.001
Mitral valve replacement	1.5	1.2–2.1	0.004
Age at operation	1.1	1.1–1.2	≤0.001

Conclusiones

1. Complicación grave, mortalidad hospitalaria entre el 20-40% dependiendo de las características clínicas y tratamiento recibido

2. Supervivencia a los 5 años de la cirugía oscila entre el 54-87%

3. En la EP tardía se ha comunicado una mortalidad del 41% a los 5 años y 48% a los 10 años. Superada la fase aguda, sobre todo si el paciente ha sido intervenido, la mortalidad a largo plazo se relaciona más con el perfil del paciente que con la endocarditis

4. Importante realizar una valoración pronóstica inicial (primeras 48 horas) para estratificar el riesgo, identificando los pacientes que se pueden beneficiar de un tratamiento más agresivo.

Conclusiones

5. Factores de riesgo asociados con mal pronóstico : edad, EP precoz (2 primeros meses), insuficiencia cardiaca, ACV y las complicaciones perianulares

6. Los pacientes con EVP tienen más riesgo de reinfecciónes y recaídas que con EVN.

7. Factores de riesgo para la recurrencia : complicaciones perianulares, microorganismos resistentes y cultivo positivo de la válvula extraida
8. Muy importante la prevención

Muchas gracias