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ENDOCARDITIS INFECCIOSA.

Puesta al día

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- Infección microbiana, habitualmente bacteriana (puede ser micótica o parasitaria) del tejido endocárdico. La lesión característica la constituyen las vegetaciones que suelen asentar en el endocardio valvular, aunque pueden afectar también las cuerdas tendinosas, músculos papilares, el endocardio mural, prótesis valvulares y catéteres de dispositivos endovasculares (MCP/CDI)

- Es una enfermedad "relativamente" infrecuente. *

- El impacto en quienes la padecen es de importancia, ya que continúa ocasionando una elevada morbilidad y mortalidad.

Enfermedad “relativamente” poco frecuente:

- Global: 1.7 - 6.2 casos/100.000 hab/año
- > 50 años: >15 casos/100.000 hab/año
- Nosocomial: 27 casos/100.000 hab/año
- AIV: >150 casos/100.000 hab/año
- V. Protésica: 630-940/100.000 pac/año

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Bin Abdulhak AA, et al. Global and regional burden of infective endocarditis, 1990–2010: a systematic review of the literature. Glob Heart. 2014; 9:131–143. [PubMed: 25432123]

Year	Author Key publication
1674	Lazare Riviére (1589-1655) *Opera Medica Universa*
1771	Giovanni Battista Morgagni (1682-1771) *De sedibus, et causis morborum per anatomen indagatis*
1806	Jean-Nicolas Corvisart (1755-1821) *Essai sur les maladies et les lésions organiques du Coeur et des gros vaisseaux*
1815	Joseph Hodgson (1788-1869) *On the Diseases of Arteries and Veins*
1826	René-Theophile Hyacinthe Laennec (1781-1826) *Traité des maladies des poumons et du coeur*
1824	Jean Baptiste Bouillaud (1796-1881) *Traité clinique des maladies du coeur*
1852	William Senhouse Kirkes (1823-1864) *On the effects which may result from the separation of fibrinous deposits from the valves or interior of the left side of the heart, and their mixture with the systemic blood* *On the effects which may result from the detachment of fibrinous deposits from the right valves of the heart*
1869	Emanuel Fredrik Hagbarth Winge (1827-1894) *[Mycosis endocardii]* (Norwegian)
1870	Samuel Wilks (1824-1911) *Capillary embolism or arterial pyaemia*
1872	Hjalmar Heiberg (1837-1897) *Ein Fall von Endocarditis ulcerosa puerperalis mit Pilzhildungen in Herzen (Mycoses endocardia)*
1878	Edwin Klebs (1834-1913) *Weitere Beiträge zur Enststehungsceshichte der endocarditis*
1884	Byrom Bramwell (1847-1931) *Diseases of the Heart and Thoracic Aorta*
1885-1909	William Osler (1849-1919) *On some points in the etiology and pathology of ulcerative endocarditis* *Galstonian lectures on malignant endocarditis* *Endocarditis infectieuses chroniques* *Chronic infectious endocarditis*
1903	Hugo Schottmuller (1867-1936) *Die Artunterscheidung der fur den Menschen pathogenen Streptokokken Munchen*
1910	Max Friedrich Löhlein (1877-1921) *Uber hamorrhagische Nierenaffectionen bei chronischer ulceroser Endocarditis*
1910	Emanuel Libman (1872-1946) *The etiology of subacute infective endocarditis*
1912	George Baehr (1887-1978) *Glomerular lesions of subacute bacterial endocarditis*

The New England
Journal of Medicine

VOLUME 208 MARCH 23, 1933 NUMBER 12

THE RELATION OF SUBACUTE AND ACUTE BACTERIAL ENDOCARDITIS TO RHEUMATIC ENDOCARDITIS*

A Study of 66 Cases With Necropsies

BY DAVID DAVIS, M.D.,† AND SOMA WEISS, M.D.†

THE studies of Shotmüller, Libman, Thayer, Horner, and others have made the clinical recognition of subacute and acute bacterial endocarditis relatively simple. In the past, the diagnostic criteria of the disease, variations in the clinical course, and the morphology and bacteriology of the cardiac lesions have been the center of interest. The relation of subacute bacterial endocarditis to rheumatic endocarditis, nostic criteria of subacute bacterial endocarditis, the separation of the cases of subacute from those of acute bacterial endocarditis was difficult in some instances. A majority of investigators restrict the use of subacute bacterial endocarditis to an endocarditis caused by the streptococcus viridans and usually with vegetations containing large numbers of these organisms. The disease, as generally defined, runs a

- Era pre-Atb → Mortalidad 100%
- 1° hito) Aparición del tto ATB → Mortalidad 40%
- 2° hito) Aparición de la cardiocirugía → Mortalidad 25%
- 60 años después → Mortalidad 25% (!!!???)

¿Qué ha cambiado?

- Población afectada ≠
- Agentes causales ≠
- Métodos diagnósticos ≠
- Tratamientos ≠

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¿Qué ha cambiado?

Población

Históricamente estaba relacionada a cardiopatías congénitas y a Fiebre reumática. → < 5%

Actualmente se distinguen como poblaciones de riesgo:

- Pacientes con enfermedad valvular pre-existente y bacteriemia adquirida en la comunidad.
- Pacientes sometidos a procedimientos invasivos.

Degenerativa

↓

- E.I nosocomial (Intrahospitalaria)
- E.I asociada a cuidados de la salud (ej. Hemodialisis)

- Pacientes con adicción a drogas EV.

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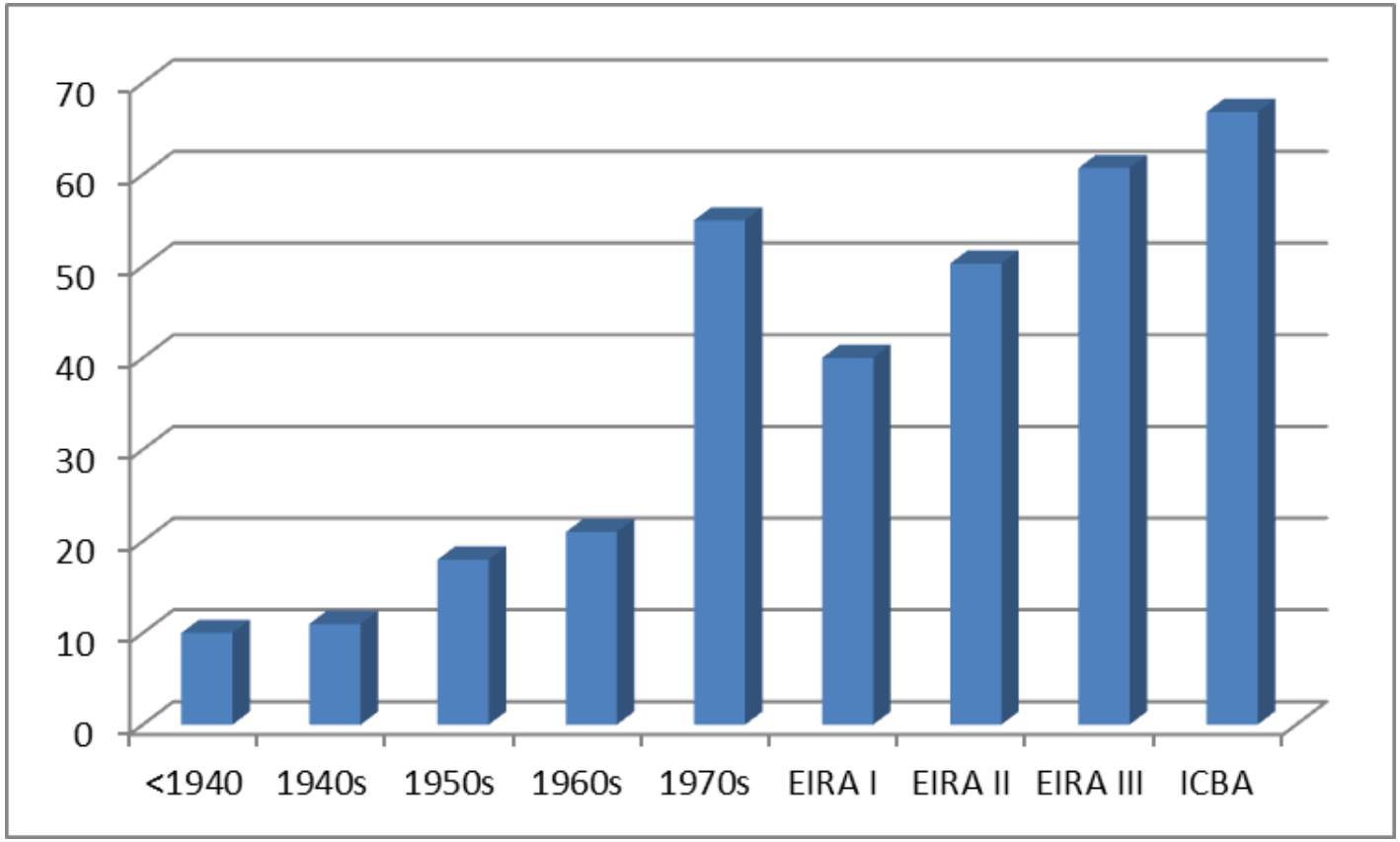
Promedio de edad afectada



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Pregunta 1

¿ Cuál es es el microorganismo mayormente relacionado a la EI de VN?

a- St. Viridans

b- Staf. aureus

c- Enterococo

d- SCN

Microbiología

Microorganismos	1970 (%)	1980 (%)	1990 (%)	2000 (%)
Staphylococcus aureus	14	24	28	31
Staphylococcus coagulasa negativa	<5	9	7	11
Streptococcus viridans	43	29	28	17
Bacilos Gram-negativos	5	4	4	2
Otros Streptococcus spp (incluido Entero – bovis)	15	19	23	25
Cultivos negativos	18	10	5	10

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David R. Murdoch,et al. Clinical Presentation, Etiology, and Outcome of Infective Endocarditis in the 21st Century. ARCH INTERN MED/VOL 169 (NO. 5), MAR 9, 2009

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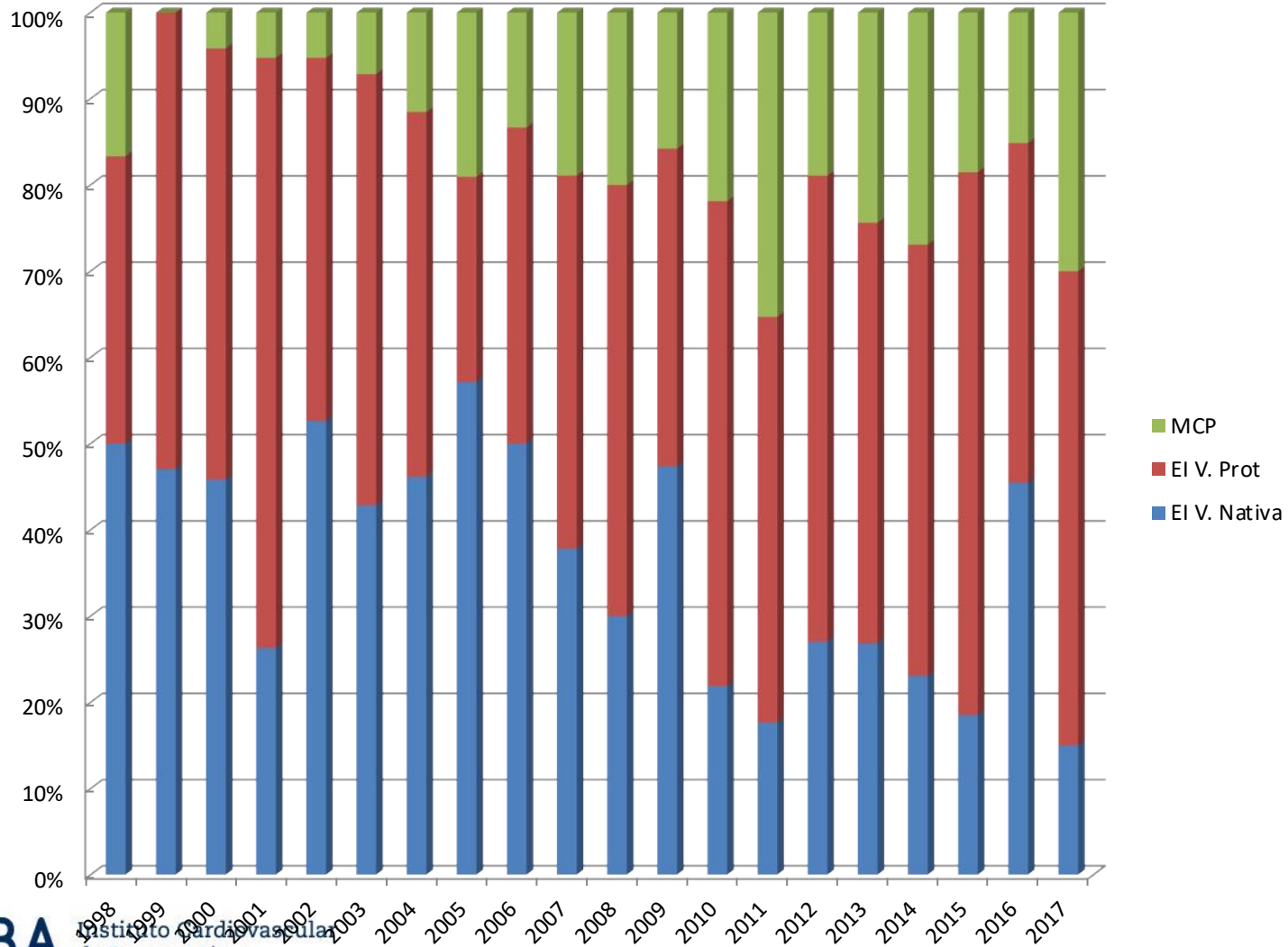
Endocarditis Infecciosa
EIRA III – Argentina (n= 502)

Microorganismo	n	%
Staphylococcus spp	210	46,3
S. aureus	148	29,5
SCN	56	11
Streptococcus spp	128	28
S. viridans	82	16
S. bovis	26	5,2
Otros	20	4
Enterococcus spp	58	11,5
Hongos	9	1,8
HC negativos	43	8,6

85,8%

Estudio EIRA
Endocarditis Infecciosa en la República Argentina

Casos consecutivos de EI (ICBA 1998-2017)



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I.C.B.A

	1998-2006 (n:177)	2007-2014 (n: 247)	p
Edad	64 (DS ± 14,4)	67,2 (DS ± 14,33)	0.08
Sexo (M)	71,6%	67,2%	0.38
EI VN	81 (47,9%)	75 (30,4%)	0.0012
Definidas	71 (87,6%)	59 (78,7%)	0.132
EI VP	72 (42,6%)	118 (47,8%)	0,14
Definidas	46 (64%)	95 (80,5%)	0.011
Asoc. a MCP	18 (10,2%)	54 (21,9%)	0.0015
Microorganismos			
S. aureus	19,6%	15,4%	0.24
SCN	8,6%	14,6%	0.056
SGV	19,6%	17%	0,46
***Enterococcus* spp**	6,7%	14,2%	0.016
BGN	9,9%	6,1%	0.17
HACEK	1,2%	0,8%	
***Candida* spp**	3,1%	2,4%	0.8
HC negativos	21,5%	26%	0,29
Cirugía	46,1%	49%	0.50
Mortalidad hospitalaria global	24,3%	15,8%	0.02
Mortalidad en "válvulas"	23,75%	17%	0,12

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Table 3. Regional Comparison of Clinical Characteristics of Prosthetic Valve Endocarditis (PVE)*

	Overall	United States	South America	Australia/ New Zealand Asia
No. of sites	53	10	7	11
No. of PVE cases	556	116	66	120
PVE per total infective endocarditis cases reported, %	20.1	20.9	11.9	21.6
Early PVE, %	13.8	21.1	10.3	11.7
Health care–associated infection	203 (36.5)	52 (44.8)	22 (33.3)	38 (31.7)
Non-nosocomial health care–associated infection	62 (11.2)	25 (21.6)	5 (7.6)	12 (10.0)
Presumed intravascular device source	87 (15.7)	32 (27.6)	5 (7.6)	11 (9.2)
Hemodialysis	25 (4.5)	15 (12.9)	2 (3.0)	2 (1.7)
Staphylococcus aureus	128 (23.0)	38 (32.8)	7 (10.6)	28 (23.3)
Coagulase-negative staphylococci	94 (16.9)	20 (17.2)	7 (10.6)	14 (11.7)
Persistent bacteremia	49 (8.8)	22 (19.0)	3 (4.6)	7 (5.8)
Congestive heart failure	183 (32.9)	53 (45.7)	27 (40.9)	23 (19.2)
In-hospital mortality	127 (22.8)	21 (18.1)	16 (24.2)	21 (17.5)

Clínica

- Habitualmente inespecífica

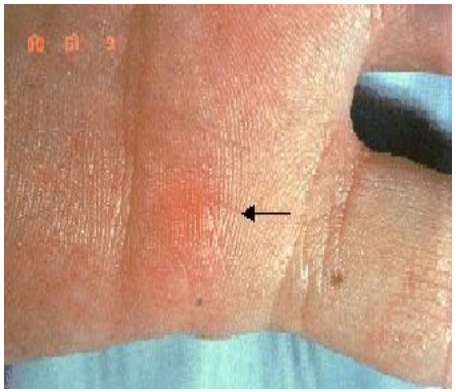
- Los hallazgos patognomónicos son infrecuentes y de aparición tardía.

• Fiebre	•Astenia / pérdida de peso
• Sudoración nocturna	•Esplenomegalia
• Hematuria	•Petequias
• NUEVO SOPLO	•Nódulos de OSLER
• Lesiones de JANEWAY	•Hemorragias en astilla
• Manchas de Roth (Fondo de ojo)	•INSUFICIENCIA CARDIACA
• Signos de EMBOLIAS PERFERICA	

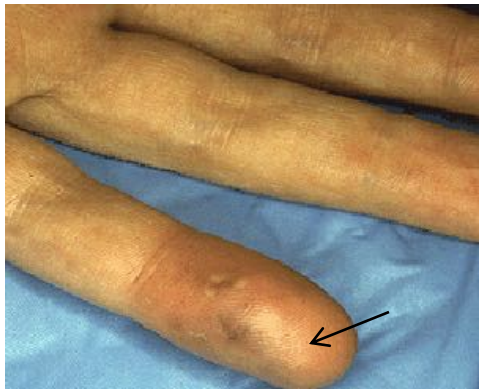
Endocarditis Infecciosa
Presentación clínica inespecífica – EIRA II

- **Forma de presentación en EI de VN:**
  - **Fiebre + nuevo soplo + esplenomegalia**
  - **Ausencia de otra fuente de infección**

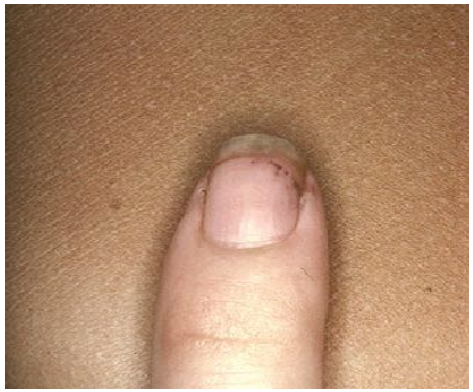
26%



Janeway



N. de Osler



Hemorragias en astilla

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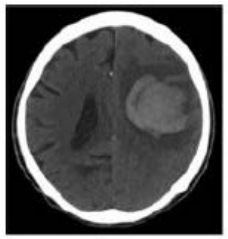
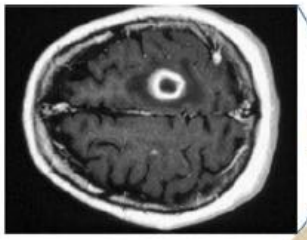
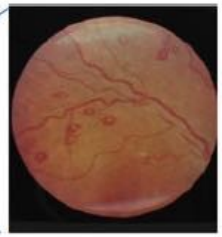
Nacinovich F y col – EIRA II (Datos no publicados)



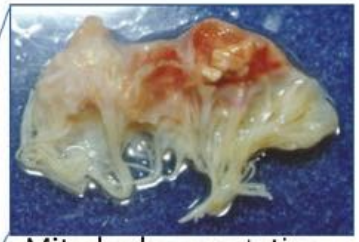
Embolic stroke with hemorrhagic conversion



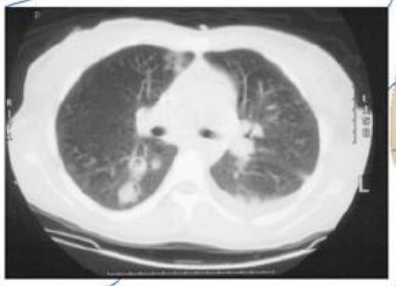
Pyogenic brain abscess



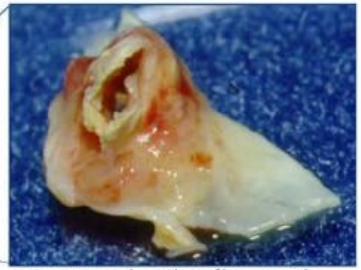
Roth spots



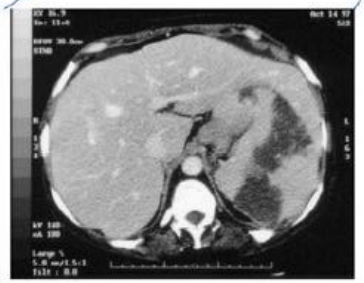
Mitral valve vegetation



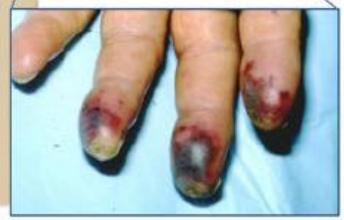
Septic pulmonary emboli



Aortic valve leaflet with perforation



Splenic infarcts



Peripheral (finger) infarcts

Pacer lead with vegetation

Endocarditis Infecciosa
Complicaciones "silentes"

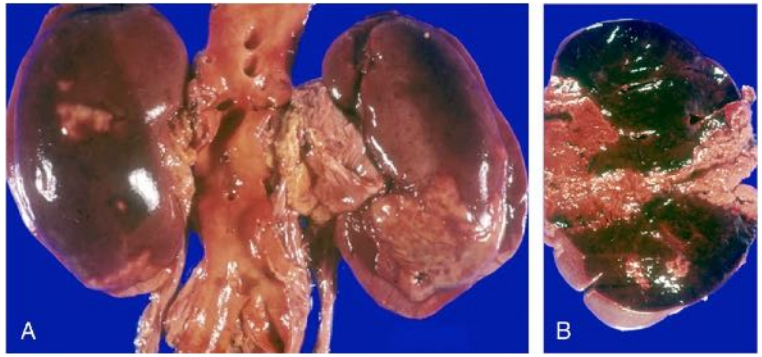


TABLE 4. Systemic Pathology

Feature	Time Period No. (%) Period 1 (1970–1985) (n = 40)	Period 2 (1986–2008) (n = 28)
Infarcts		
Spleen	14 (39)	8 (29)
Kidneys	11 (30)	10 (36)
Lungs	6 (17)	
Mesentery	3 (7.5)	1 (3.6)
Abscess		
Kidneys	7 (19)	5 (18)
Lungs	5 (14)	2 (7)
Spleen	2	3 (11)
Liver	2	1 (3.6)
Septic spleen	12 (30)	6 (21.4)
Arterial emboli	4 (10)	2 (7)
Glomerulonephritis	6 (15)	2 (7)
Mycotic aneurysms	3 (7.5)	2 (7)

63%

40%

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Fernandez Guerrero M y col. Medicine 2012;91:152

Endocarditis Infecciosa
Complicaciones "silentes"

Cerebrovascular Complications in Patients with Left-Sided Infective Endocarditis Are Common: A Prospective Study Using Magnetic Resonance Imaging and Neurochemical Brain Damage Markers

Subclinical Brain Embolization in Left-Sided Infective Endocarditis

Results From the Evaluation by MRI of the Brains of Patients With Left-Sided Intracardiac Solid Masses (EMBOLISM) Pilot Study

Howard A. Cooper, MD; Elis
Alexander S. Ma

Background—Acute brain embolization
decision making. The true incidence
Methods and Results—We prospectivel
examined by a study neurologist, an
Patients without clinical evidence c
considered to have subclinical brain
patients undergoing magnetic resonar
were 48% and 80%, respectively. AB
At 3 months, mortality was similar among patients with clinical stroke and subclinical brain embolization (62% versus 53%; P=NS) and was higher among patients with any ABE than among those without ABE (56% versus 12%; P=0.046). Valvular surgery was performed in 25 patients (45%), including 16 with ABE, at a median of 4 days. No patient suffered a postoperative neurological complication. Surgery was independently associated with a lower risk of mortality at 3 months (odds ratio, 0.1; 95% confidence interval, 0.03 to 0.6; P=0.008).
Conclusions—Magnetic resonance imaging detected subclinical brain embolization in a substantial number of patients with left-sided infective endocarditis, suggesting that the incidence of ABE may be significantly higher than reports based on clinical and computed tomography findings have indicated. Brain magnetic resonance imaging may play a role in the complex decision about surgical intervention in infective endocarditis. (*Circulation*. 2009;120:585-591.)

Key Words: infective endocarditis ■ magnetic resonance imaging ■ stroke ■ surgery

Stroke

- **clinico: 25 – 30%**
- **silente: 48 - 80%**

Clin Infect Dis 2008;47:23

Circulation 2009;120:585

Diagnóstico

New Criteria for Diagnosis of Infective Endocarditis: Utilization of

DAVID T. DURACK, M.B., D.Ph
ENDOCARDITIS SERVICE,* Durh

PURPOSE: This study
velop improved crite
infective endocardit
criteria with current
a large series of case
PATIENTS AND METHO
secutive cases of susp
carditis in 353 patien
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analyzed using new c
endocarditis. We defi
criteria" (typical blo
echocardiogram) and

CLINICAL ARTICLES

Proposed Modifications to the Duke Criteria for the Diagnosis of Infective Endocarditis

Jennifer S. Li,[1,4] Daniel J. Sexton,[2,3] Nathan Mick,[3] Richard Nettles,[3] Vance G. Fowler, Jr.,[2,3] Thomas Ryan,[1,3] Thomas Bashore,[1,3] and G. Ralph Corey[2,3]

From the Divisions of [1]Cardiology and [2]Infectious Diseases, and Departments of [3]Medicine and [4]Pediatrics, Duke University School of Medicine, Durham, North Carolina

Although the sensitivity and specificity of the Duke criteria for the diagnosis of infective endocarditis (IE) have been validated by investigators from Europe and the United States, several shortcomings of this schema remain. The Duke IE database contains records collected prospectively on >800 cases of definite and possible IE since 1984. Databases on echocardiograms and on patients with *Staphylococcus aureus* bacteremia at Duke University Medical Center are also maintained. Analyses of these databases, our experience with the Duke criteria in clinical practice, and analysis of the work of others have led us to propose the following modifications of the Duke schema. The category "possible IE" should be defined as having at least 1 major criterion and 1 minor criterion or 3 minor criteria. The minor criterion "echocardiogram consistent with IE but not meeting major criterion" should be eliminated, given the widespread use of transesophageal echocardiography (TEE). Bacteremia due to *S. aureus* should be considered a major criterion, regardless of whether the infection is nosocomially acquired or whether a removable source of infection is present. Positive Q-fever serology should be changed to a major criterion.

ICBA Inst de

2 pilares diagnósticos :

- DX MICROBIOLÓGICO (HEMOCULTIVOS)
- DX POR IMÁGENS (ECOCARDIOGRAMA)

Criterios de Duke

(modificados Guias Europeas 2015)

Major criteria

1. Blood cultues positive for IE

a. Typical microorganisms consistent with IE from 2 separate blood cultures:
- *Viridans streptococci, Streptococcus gallolyticus (Streptococcus bovis), HACEK group, Staphylococcus aureus;* or
- Community-acquired enterococci, in the absence of a primary focus; or

b. Microorganisms consistent with IE from persistently positive blood cultures:
- ≥2 positive blood cultures of blood samples drawn >12 h apart; or
- All of 3 or a majority of ≥4 separate cultures of blood (with first and last samples drawn ≥1 h apart); or

c. Single positive blood culture for Coxiella burnetii or phase I IgG antibody titre >1:800

2. Imaging positive for IE

a. Echocardiogram positive for IE:
- Vegetation;
- Abscess, pseudoaneurysm, intracardiac fistula;
- Valvular perforation or aneurysm;
- New partial dehiscence of prosthetic valve.

b. Abnormal activity around the site of prosthetic valve implantation detected by ^{18}F-FDG PET/CT (only if the prosthesis was implanted for >3 months) or radiolabelled leukocytes SPECT/CT.

c. Definite paravalvular lesions by cardiac CT.

Minor criteria

1. Predisposition such as predisposing heart condition, or injection drug use.
2. Fever defined as temperature >38°C.
3. Vascular phenomena (including those detected by imaging only): major arterial emboli, septic pulmonary infarcts, infectious (mycotic) aneurysm, intracranial haemorrhage, conjunctival haemorrhages, and Janeway's lesions.
4. Immunological phenomena: glomerulonephritis, Osler's nodes, Roth's spots, and rheumatoid factor.
5. Microbiological evidence: positive blood culture but does not meet a major criterion as noted above or serological evidence of active infection with organism consistent with IE.

Criterios clínicos:

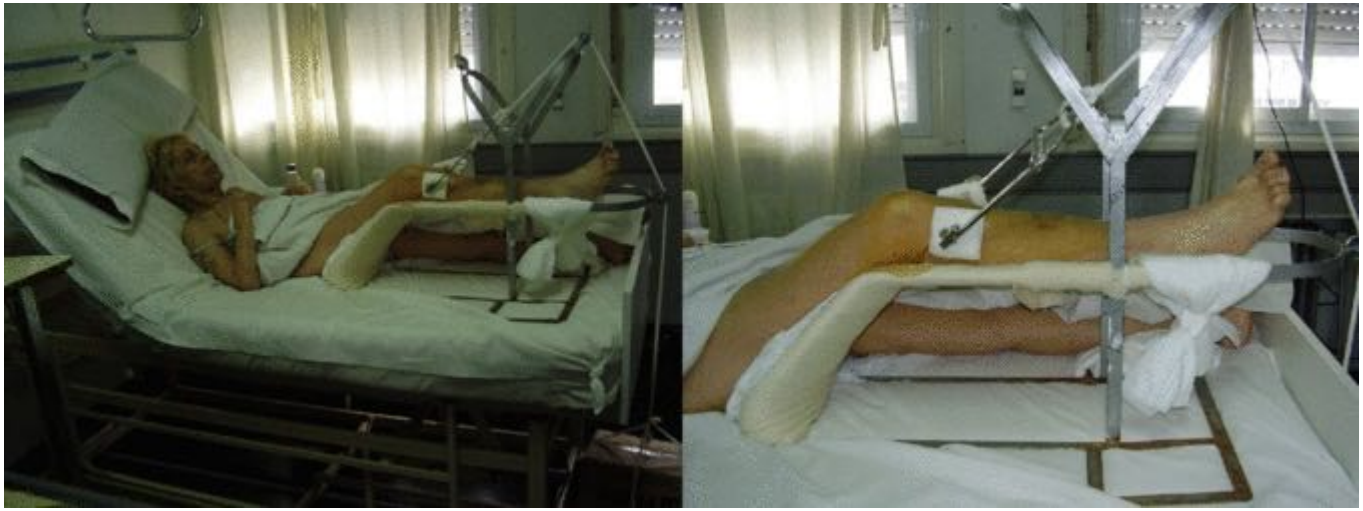
- 2 Criterios mayores.
- 1 Criterio mayor y 3 Criterios menores.
- 5 Criterios menores.

Endocarditis “Posible”:

- 1 Criterio mayor y 1 Criterio menor.
- 3 Criterios menores.

- Valor predictivo negativo: > 92%
- Valor predictivo positivo: 89%

- Pte de 85 años. Antecedente de CRVAo biológica hace 7 años.
- Cursando internación por fractura de cadera por caída desde propia altura
- Al 8º día presenta fiebre 2ª a infección asociada a catéter venoso central, con HMC + para *SAMR*



- Pte de 85 años. Antecedente de CRVAo biológica hace 7 años.
- Cursando internación por fractura de cadera por caída desde propia altura
- Al 5º día POP presenta fiebre 2ª a infección asociada a cateter venoso central, con HMC + para *SAMR*

- Pte de 85 años. Antecedente de CRVAo biológica hace 7 años.
- Cursando internación por fractura de cadera por caída desde propia altura
- Al 5º día POP presenta fiebre 2ª a infección asociada a cateter venoso central, con HMC + para *SAMR*

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El Posible

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Bacteriemia por *S. aureus*

- Criterio Mayor (criterios de Duke modificados)
- Todo paciente con bacteriemia por *S. Aureus* **debe ser estudiado**, para descartar EI

Endocarditis de válvula protésica
Bacteriemia por *S. aureus*

Volume 118, Issue 3, Pages 225-229 (March 2005)

Risk of endocarditis among patients with prosthetic valves and *Staphylococcus aureus* bacteremia

Fadi El-Ahdab, MD[a], Daniel Kelly Benjamin Jr, MD, MPH, PhD[df], Andrew Wang, MD[c], Christopher H. Cabell, MD, MHS[acf], Vivian H. Chu, MD[bf], Martin E. Stryjewski, MD, MHS[bf], G. Ralph Corey, MD[bf], Daniel J. Sexton, MD[b], L. Barth Reller, MD[be], Vance G. Fowler Jr, MD, MHS[bf]

Purpose

Staphylococcus aureus is a common cause of bacteremia and of native valve infective endocarditis. However, the risk of endocarditis in patients with a prosthetic valve who develop *S. aureus* bacteremia is unclear. The aim of this study was to define the risk of prosthetic valve endocarditis in patients with *S. aureus* bacteremia.

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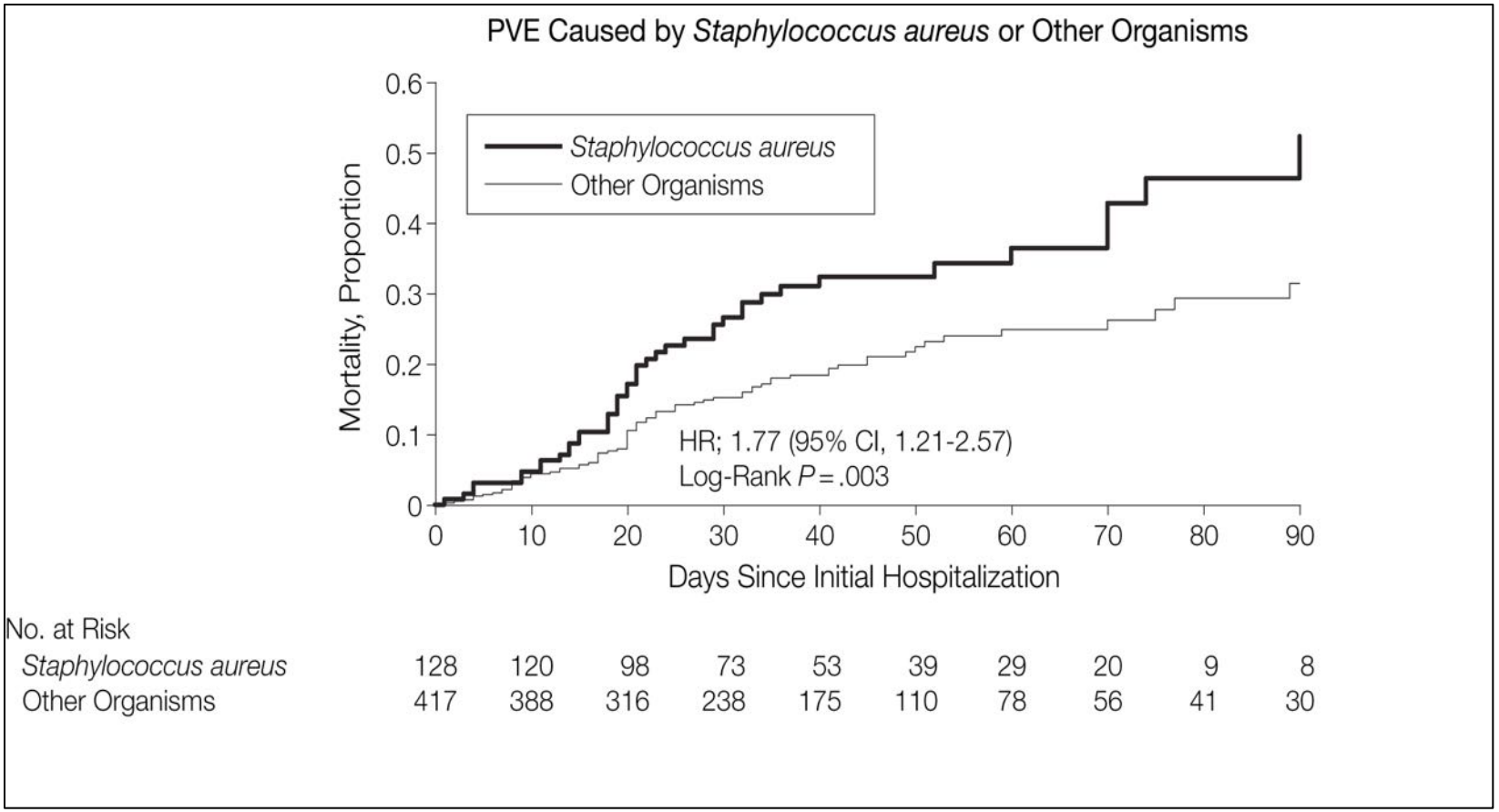
- 51 pacientes con VP con HC + para *S. aureus*.
- Origen de la bacteriemia:
  - Comunidad: 26%
  - Nosocomial: 47%
  - *Health-care*: 27%
- Fuente: ISQ 33%
- Endocarditis: 51%
- Mortalidad (12 semanas): 62%

Endocarditis de válvula protésica
Mortalidad hospitalaria



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¿Enterococo?

Major criteria

1. Blood cultures positive for IE

a. Typical microorganisms consistent with IE from 2 separate blood cultures:
- *Viridans streptococci, Streptococcus gallolyticus (Streptococcus bovis), HACEK group, Staphylococcus aureus*; or
- Community-acquired enterococci, in the absence of a primary focus; or

b. Microorganisms consistent with IE from persistently positive blood cultures:
- ≥2 positive blood cultures of blood samples drawn >12 h apart; or
- All of 3 or a majority of ≥4 separate cultures of blood (with first and last samples drawn ≥1 h apart); or

c. Single positive blood culture for Coxiella burnetii or phase I IgG antibody titre >1:800

2. Imaging positive for IE

a. Echocardiogram positive for IE:
- Vegetation;
- Abscess, pseudoaneurysm, intracardiac fistula;
- Valvular perforation or aneurysm;
- New partial dehiscence of prosthetic valve.

b. Abnormal activity around the site of prosthetic valve implantation detected by ^{18}F-FDG PET/CT (only if the prosthesis was implanted for >3 months) or radiolabelled leukocytes SPECT/CT.

c. Definite paravalvular lesions by cardiac CT.

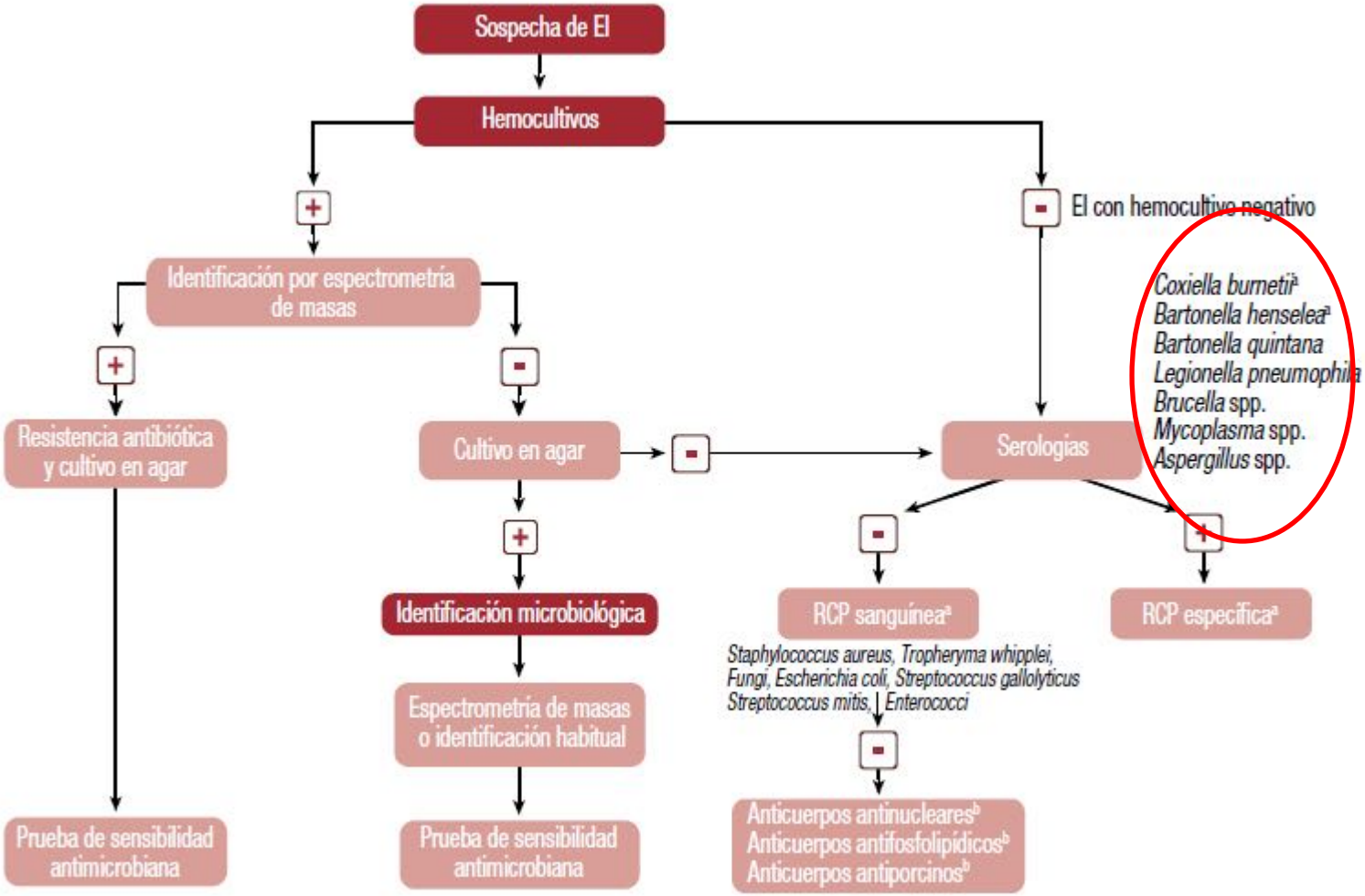
Clinical Infectious Diseases
VIEWPOINTS

Sign of the Times: Updating Infective Endocarditis Diagnostic Criteria to Recognize *Enterococcus faecalis* as a Typical Endocarditis Bacterium

Anders Dahl,[1,2] Vance G. Fowler,[3] José M. Miro,[2,4] and Niels E. Bruun[5,6]

[1]Department of Cardiology, Herlev-Gentofte University Hospital Copenhagen, Denmark; [2]Department of Infectious Diseases, Hospital Clinic-IDIBAPS, University of Barcelona, Spain; [3]Department of Infectious Diseases, Duke University Hospital, Durham, North Carolina, USA; [4]Centro de Investigación Biomédica en Red de Enfermedades Infecciosas (CIBERINFEC), Instituto de Salud Carlos III, Madrid, Spain; [5]Department of Cardiology, Zealand University Hospital, Roskilde, Denmark; and [6]Clinical institutes, Copenhagen and Aalborg Universities, Denmark.

Usando datos de un estudio prospectivo de 344 En pacientes con bacteriemia por E. faecalis evaluados con ecocardiografía, se demostró que designar a E. faecalis como patógeno “típico” de endocarditis, independientemente del lugar de adquisición o de la puerta de entrada, mejoró la sensibilidad para identificar correctamente endocarditis del 70% (criterios de Duke modificados) al 96% (criterios de Duke ajustados para enterococos).



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Criterios de Duke

(modificados Guias Europeas 2015)

Major criteria

1. Blood cultues positive for IE

a. Typical microorganisms consistent with IE from 2 separate blood cultures:
- *Viridans streptococci, Streptococcus gallolyticus (Streptococcus bovis), HACEK group, Staphylococcus aureus;* or
- Community-acquired enterococci, in the absence of a primary focus; or

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c. Definite paravalvular lesions by cardiac CT.

Minor criteria

1. Predisposition such as predisposing heart condition, or injection drug use.
2. Fever defined as temperature >38°C.
3. Vascular phenomena (including those detected by imaging only): major arterial emboli, septic pulmonary infarcts, infectious (mycotic) aneurysm, intracranial haemorrhage, conjunctival haemorrhages, and Janeway's lesions.
4. Immunological phenomena: glomerulonephritis, Osler's nodes, Roth's spots, and rheumatoid factor.
5. Microbiological evidence: positive blood culture but does not meet a major criterion as noted above or serological evidence of active infection with organism consistent with IE.

Pregunta 2

¿ Qué estudio(s) es/son imprescindibles para el diagnóstico adecuado de la EI?

A- Ecocardiograma doppler color trans torácico

B- Ecocardiograma transesofágico

C- Tomografía cardíaca multislice gatillada

D- PET/tc

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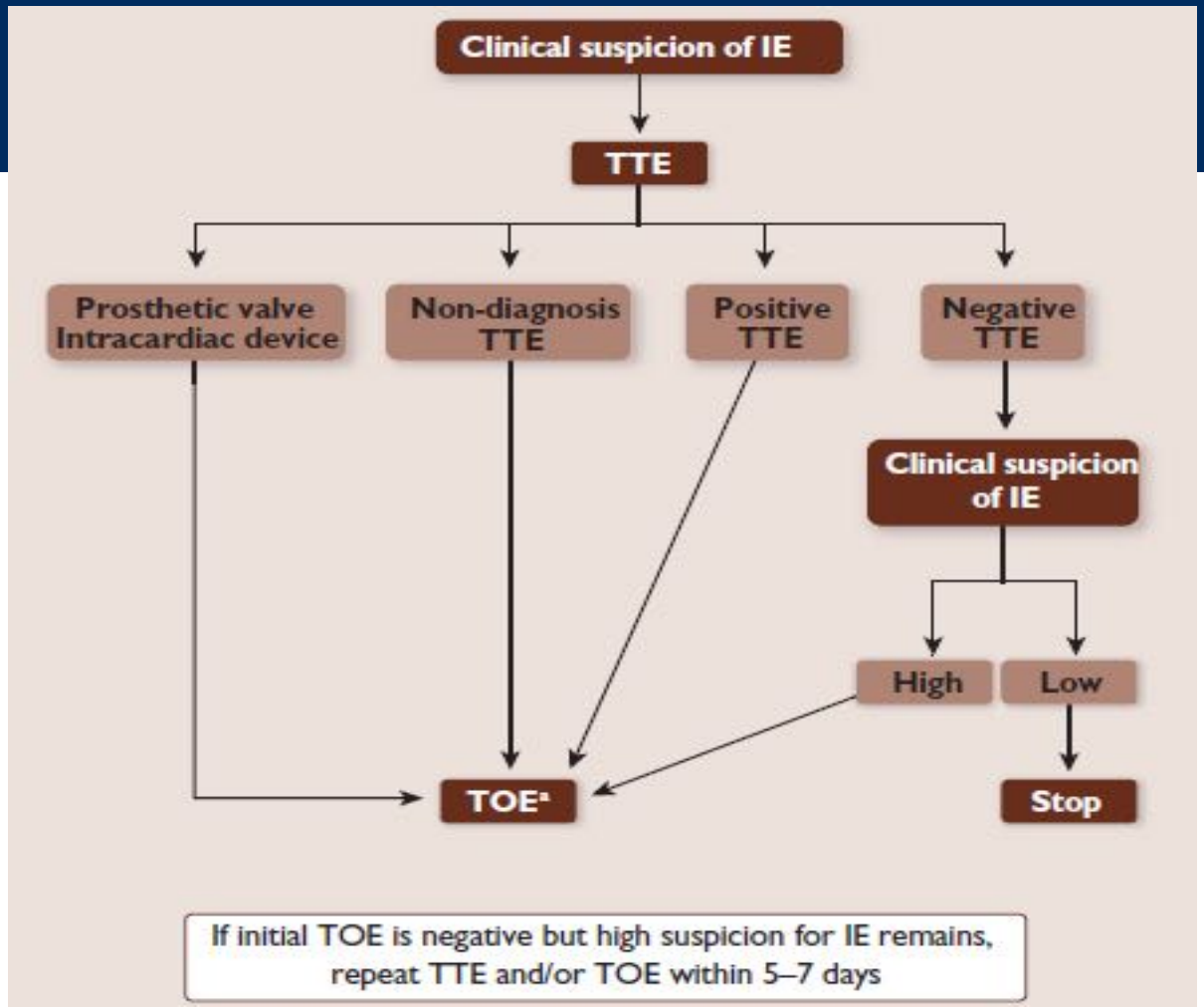
Diagnóstico Ecocardiográfico

¿Qué pedir?

- Ante la sospecha de EI en una válvula nativa, la evaluación inicial puede realizarse con un ETT.
- Si aún existen dudas o el estudio es equívoco, debe realizarse un ETE.
- En EI de válvula protésica y MCP el método de elección es el ETE.

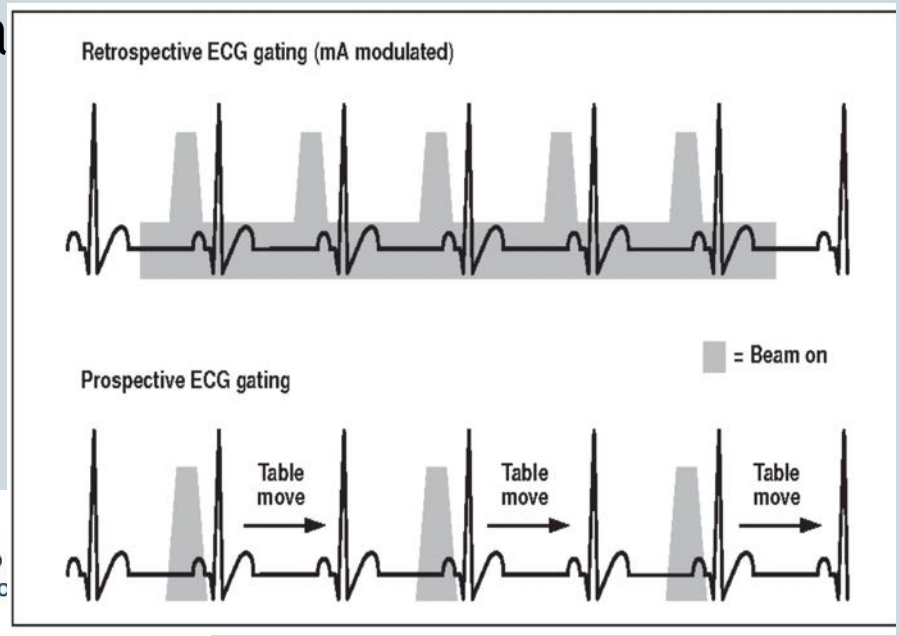


IE = infective endocarditis; TOE = transoesophageal echocardiography; TTE = transthoracic echocardiography.

[a]TOE is not mandatory in isolated right-sided native valve IE with good quality TTE examination and unequivocal echocardiographic findings.

Tomografía Cardíaca multicorte

- A partir de 2015, la demostracion de una lesion paravalvular en EI constituye para la sociedad europea un criterio mayor diagnostico.
- Alta resolucion espacial (anisotropica – 0.5 mm) y adecuada resolucion temporal con el gatillado
- Se prioriza a contraste



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Open Access

Systematic Review

Comparing the diagnostic accuracy of computed tomography vs transoesophageal echocardiography for infective endocarditis – A meta-analysis

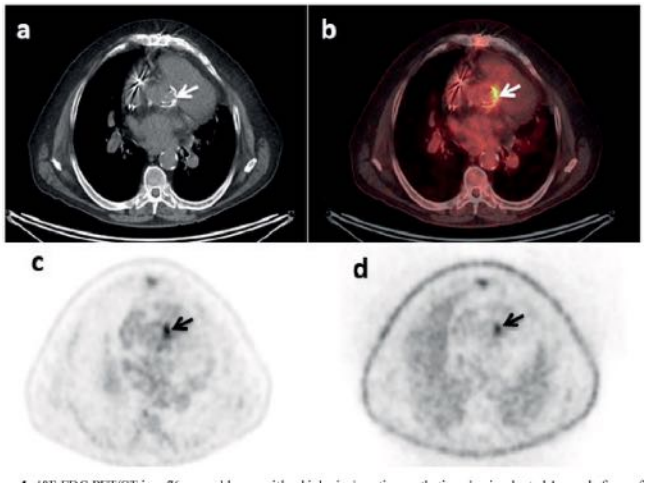
Liqin Jing[1], Yanchun Song[2]

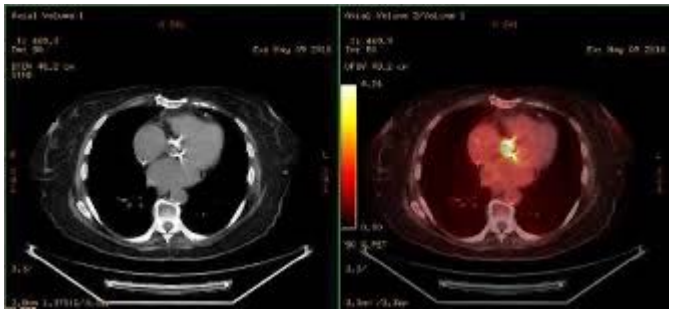
Conclusion: CT performs statistically significantly better than TEE for detecting abscesses while TEE provides statistically significant superior results for detecting vegetation. There is a need for well-designed prospective studies to further corroborate these findings.

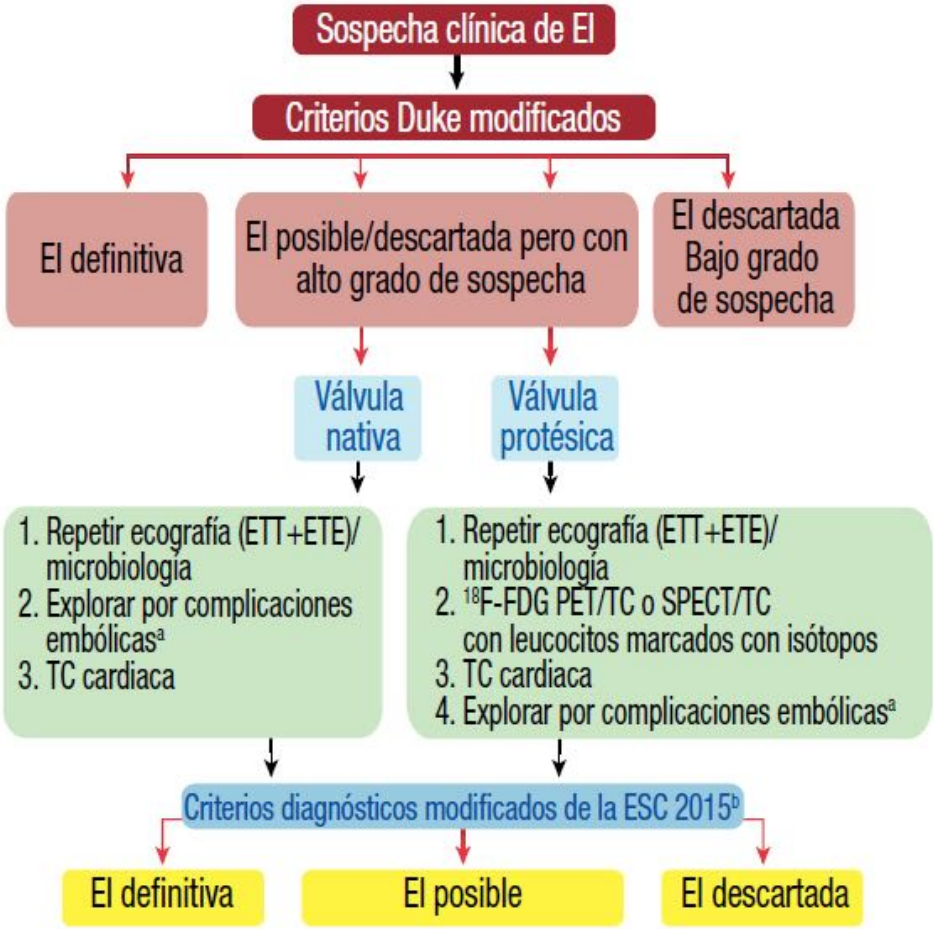
Para el hallazgo de abscesos perivalvualres, el uso de la TC es superior que el ETE, y permite una evaluación anatómica mas adecuada

PET

- Criterio Mayor en Guias Europeas (No así las de la AHA)
- Utilidad en V. protésicas y dispositivos intracardiacos (MCP/CDI)
- No aportan al diagnóstico de EI de V. nativas






Sospecha clínica de EI
Criterios Duke modificados
EI definitiva
EI posible/descartada pero con alto grado de sospecha
EI descartada Bajo grado de sospecha
Válvula nativa
Válvula protésica
1. Repetir ecografía (ETT+ETE)/ microbiología
2. Explorar por complicaciones embólicas[a]
3. TC cardiaca
1. Repetir ecografía (ETT+ETE)/ microbiología
2. ^{18}F-FDG PET/TC o SPECT/TC con leucocitos marcados con isótopos
3. TC cardiaca
4. Explorar por complicaciones embólicas[a]
Criterios diagnósticos modificados de la ESC 2015[b]
EI definitiva
EI posible
EI descartada

Pregunta 3

En relación al tratamiento antibiótico para la EI, usted. Señale la opción adecuada.

A- Inicia tratamiento ATB empírico en forma inmediata a la sospecha clínica cubriendo los gérmenes más frecuentes.

B- Toma HMC y evalúa la necesidad de iniciar Tto ATB empírico según la situación clínica del paciente.

Endocarditis Infecciosa
Tratamiento ATB

- 41% inapropiado según guías internacionales.
- Errores más comunes:
  - dosis inadecuadas
  - tratamientos cortos
- 43% de éxito vs 70% (cuando se emplearon las guías).

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Dalton SC et al. Eur Heart J 2000;21:305

- Recomendaciones nacionales e internacionales.
- Fundamental conocer datos epidemiológicos.
- Tto parenteral prolongado. No menos de 4 semanas para Streptococos S. 6 semanas para SA y 6 a 8 semanas en BGN y hongos
- En tto empírico SIEMPRE debe haber cobertura par SA, (Meticilino resistente ?????), *St. Viridans* y enterococo.

“Categorizar” al paciente para:

- Definir si es necesario un tratamiento empírico
- Identificar o estimar el microorganismo responsable
- Establecer posibilidad de tratamiento quirúrgico.
- Elegir la modalidad de manejo (hospitalario, hospitalario/ambulatorio, ambulatorio)

Cuándo comenzar el tratamiento con ATB?

Empírico: sólo en situaciones especiales

- EI aguda (10 - 20%)
- EI con HC (-) y evidencias de complicaciones (embolias, hallazgos ecocardiográficos)

Documentado (clínica y microbiología)

Table 20 Proposed antibiotic regimens for initial empirical treatment of infective endocarditis in acute severely ill patients (before pathogen identification)[a]

Antibiotic	Dosage and route	Class[b]	Level[c]	Comments
Community-acquired native valves or late prosthetic valves (≥12 months post surgery) endocarditis				
Ampicillin with (Flu)cloxacillin or oxacillin with Gentamicin[d]	12 g/day i.v. in 4–6 doses 12 g/day i.v. in 4–6 doses 3 mg/kg/day i.v. or i.m. in 1 dose	IIa	C	Patients with BCNIE should be treated in consultation with an ID specialist.
Vancomycin[d] with Gentamicin[d]	30–60 mg/kg/day i.v. in 2–3 doses 3 mg/kg/day i.v. or i.m. in 1 dose	IIb	C	For penicillin-allergic patients
Early PVE (<12 months post surgery) or nosocomial and non-nosocomial healthcare associated endocarditis				
Vancomycin[d] with Gentamicin[d] with Rifampin	30 mg/kg/day i.v. in 2 doses 3 mg/kg/day i.v. or i.m. in 1 dose 900–1200 mg i.v. or orally in 2 or 3 divided doses	IIb	C	Rifampin is only recommended for PVE and it should be started 3–5 days later than vancomycin and gentamicin has been suggested by some experts. In healthcare associated native valve endocarditis, some experts recommend in settings with a prevalence of MRSA infections >5% the combination of cloxacillin plus vancomycin until they have the final S. aureus identification

Tratamiento ATB EI V. protésica

Prosthetic valves (early, < 12 months post surgery)				
Vancomycin[b] *with* Gentamicin[a] *with* Rifampin	30 mg/kg/day i.v. in 2 doses 3 mg/kg/day i.v. or i.m. in 2 or 3 doses. 1200 mg/day orally in 2 doses	6 2	IIb C	If no clinical response, surgery and maybe extension of the antibiotic spectrum to gram-negative pathogens must be considered.
Prosthetic valves (late, ≥ 12 months post surgery)				
Same as f[illegible]ative valves				

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Table 2. Causative Organisms for Total Cohort, Early, and Late Prosthetic Valve Endocarditis (PVE)

Causative Organism	Total, No. (%) (n = 556)	Early PVE, No. (%) (n = 53)	Late PVE, No. (%) (n = 331)
Staphylococccus 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)

>20%

En aumento

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NUEVAS ESTRATEGIAS

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Partial Oral versus Intravenous Antibiotic Treatment of Endocarditis

METHODS

In a randomized, noninferiority, multicenter trial, we assigned 400 adults in stable condition who had endocarditis on the left side of the heart caused by streptococcus, *Enterococcus faecalis*, *Staphylococcus aureus*, or coagulase-negative staphylococci and who were being treated with intravenous antibiotics to continue intravenous treatment (199 patients) or to switch to oral antibiotic treatment (201 patients). In all patients, antibiotic treatment was administered intravenously for at least 10 days. If feasible, patients in the orally treated group were discharged to outpatient treatment. The primary outcome was a composite of all-cause mortality, unplanned cardiac surgery, embolic events, or relapse of bacteremia with the primary pathogen, from the time of randomization until 6 months after antibiotic treatment was completed.

Preexisting prosthesis, implant, or cardiac disease — no. (%)		
Prosthetic heart valve	53 (26.6)	54 (26.9)
Pacemaker	15 (7.5)	20 (10.0)
Other known valve disease	82 (41.2)	90 (44.8)

1554 Were excluded
- 428 Did not fulfill modified Duke criteria
- 174 Had endocarditis caused by other bacteria
- 3 Were febrile (temperature ≥38.0°C)
- 132 Had high level of C-reactive protein, white cells, or both
- 130 Had signs of abscess formation
- 13 Had no TEE available <48 hr
- 3 Were severely obese (BMI >40)
- 64 Had other infection requiring intravenous treatment
- 22 Were not expected to adhere to the assigned regimen
- 14 Had suspected reduced gastrointestinal uptake
- 303 Were not willing or able to give consent
- 18 Had heart-valve surgery planned
- 25 Had impaired immune response
- 4 Had had endocarditis within the previous yr
- 150 Met other exclusion criteria
- 71 Died

Table 2. Distribution of the Four Components of the Primary Composite Outcome.*

Component	Intravenous Treatment (N=199)	Oral Treatment (N=201)	Difference	Hazard Ratio (95% CI)
	number (percent)		*percentage points (95% CI)*	
All-cause mortality	13 (6.5)	7 (3.5)	3.0 (–1.4 to 7.7)	0.53 (0.21 to 1.32)
Unplanned cardiac surgery	6 (3.0)	6 (3.0)	0 (–3.3 to 3.4)	0.99 (0.32 to 3.07)
Embolic event	3 (1.5)	3 (1.5)	0 (–2.4 to 2.4)	0.97 (0.20 to 4.82)
Relapse of the positive blood culture†	5 (2.5)	5 (2.5)	0 (–3.1 to 3.1)	0.97 (0.28 to 3.33)

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Indicaciones Quirúrgicas

- 25-30% en la fase aguda
- 20-40% en forma programada
- En algunos países la indicación quirúrgica se ha incrementado de 31 a 50% de los casos, con un impacto importante en la mortalidad (24 a 17%)

Indicaciones Quirúrgicas

- ICC
- Disfunción valvular
- Infección persistente o no controlada a pesar de TM útil
- Complicaciones locales (absceso, fístula, ruptura del seno de Valsalva)
- Embolias recurrentes (en especial con vegetaciones grandes).
- Microorganismos especiales (hongos, bacterias multirresistentes)
- Persistencia de la fiebre a pesar de 10 días de tratamiento ATB

Table 22 Indications and timing of surgery in left-sided valve infective endocarditis (native valve endocarditis and prosthetic valve endocarditis)

Indications for surgery	Timing[a]	Class[b]	Level[c]	Ref.[d]
1. Heart failure				
Aortic or mitral NVE or PVE with severe acute regurgitation, obstruction or fistula causing refractory pulmonary oedema or cardiogenic shock	Emergency	I	B	111,115, 213,216
Aortic or mitral NVE or PVE with severe regurgitation or obstruction causing symptoms of HF or echocardiographic signs of poor haemodynamic tolerance	Urgent	I	B	37,115, 209,216, 220,221
2. Uncontrolled infection				
Locally uncontrolled infection (abscess, false aneurysm, fistula, enlarging vegetation)	Urgent	I	B	37,209, 216
Infection caused by fungi or multiresistant organisms	Urgent/ elective	I	C	
Persisting positive blood cultures despite appropriate antibiotic therapy and adequate control of septic metastatic foci	Urgent	IIa	B	123
PVE caused by staphylococci or non-HACEK gram-negative bacteria	Urgent/ elective	IIa	C	
3. Prevention of embolism				
Aortic or mitral NVE or PVE with persistent vegetations >10 mm after one or more embolic episode despite appropriate antibiotic therapy	Urgent	I	B	9,58,72, 113,222
Aortic or mitral NVE with vegetations >10 mm, associated with severe valve stenosis or regurgitation, and low operative risk	Urgent	IIa	B	9
Aortic or mitral NVE or PVE with isolated very large vegetations (>30 mm)	Urgent	IIa	B	113
Aortic or mitral NVE or PVE with isolated large vegetations (>15 mm) and no other indication for surgery[e]	Urgent	IIb	C	

European Journal of Cardio-Thoracic Surgery 0 (2018) 1–7
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ORIGINAL ARTICLE

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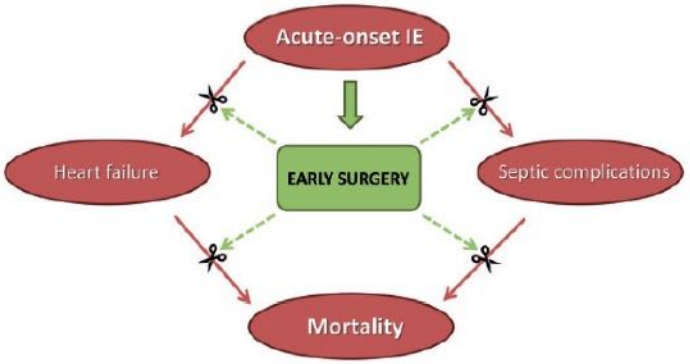
Early surgery for acute-onset infective endocarditis

Carlos Ferrera[a,*], Isidre Vilacosta[a], Cristina Fernández[b], Javier López[c], Cristina Sarriá[d], Carmen Olmos[a], Manuel Carnero-Alcázar[a], David Vivas[a], Salvatore Di Stefano[c], Carmen Sáez[d], Javier Cobiella[a], Daniel García-Arribas[a], Luis Carlos Maroto Castellanos[a] and J. Alberto San Román[c]



RESULTS: At admission, acute renal failure, septic shock and cerebral embolism predominated among patients with acute-onset endocarditis. *Staphylococcus aureus* was more frequently isolated in patients with an acute onset (27.7% vs 7.8% $P < 0.001$). During hospitalization, patients with acute onset developed systemic embolism and septic shock more frequently. Death was much more common in this group (42.7 vs 30.1%, $P < 0.001$). Paravalvular complications, nosocomial infection, heart failure, *S. aureus* and septic shock were predictors of mortality. Acute-onset presentation of endocarditis was strongly associated with increased mortality. Among patients with acute-onset endocarditis, early surgery, performed within the first 2 days after diagnosis, was associated with a 64% of reduction in mortality.

CONCLUSIONS: Patients with endocarditis and acute onset of symptoms are at high risk of septic in-hospital complications and mortality. Early surgery, performed within the first 2 days after diagnosis, plays a central role in the treatment of these patients.

PROBLEMA

- Era pre-Atb → Mortalidad 100%
- 1° hito) Aparición del tto ATB → Mortalidad 40%
- 2° hito) Aparición de la cardiocirugía → Mortalidad 25%
- 60 años después → Mortalidad 25% (!!!???)

3º hito) → Equipo multidisciplinario («Endocarditis Team»)

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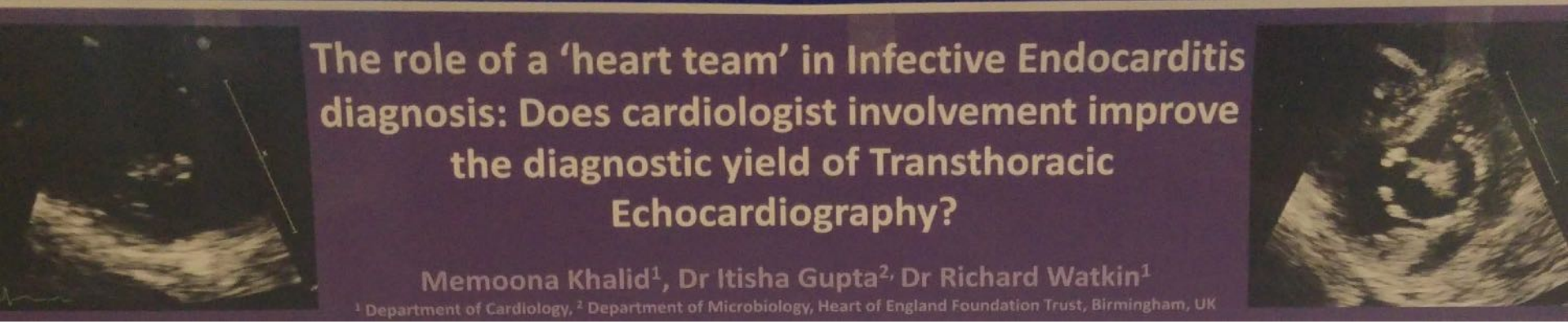
4. EQUIPO MULTIDISCIPLINARIO DE ENDOCARDITIS

Papel del equipo multidisciplinario de endocarditis
1. El equipo multidisciplinario de endocarditis tiene que reunirse regularmente para discutir casos, tomar decisiones quirúrgicas y definir el tipo de seguimiento
2. El equipo multidisciplinario de endocarditis debe escoger el tipo, la duración y la forma de seguimiento del tratamiento antibiótico según un protocolo estandarizado que siga las guías actuales
3. El equipo multidisciplinario de endocarditis debe participar en registros nacionales o internacionales, informar públicamente sobre la mortalidad y la morbilidad en su centro y participar en programas de mejora de calidad y de asesoramiento a los pacientes
4. El seguimiento tiene que organizarse en forma de visitas ambulatorias con una frecuencia que dependa del estado clínico del paciente (idealmente 1, 3, 6 y 12 meses tras el alta, ya que la mayoría de las complicaciones ocurren en ese periodo[57])



Estudio retrospectivo que revisa todos los pacientes hospitalizados derivado para TTE durante un año a las dos Hospitales del Reino Unido, con diferentes protocolos de diagnóstico, uno con protocolo «convencional» y otro donde funcionaba un E. Team

Conclusión: "equipo formal de endocarditis", limita la El uso inapropiado de recursos, mejora el rendimiento diagnóstico y como consecuencia se mejora la capacidad de tratamiento del paciente.

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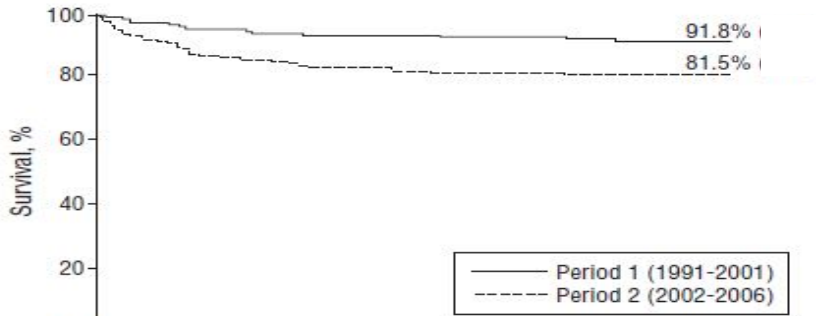
Dramatic Reduction in Infective Endocarditis–Related Mortality With a Management-Based Approach

Elisabeth Botelho-Nevers, MD; Franck Thuny, MD; Jean Paul Casalta, MD; Hervé Richet, MD, PhD; Frédérique Gouriet, MD, PhD; Frédéric Collart, MD; Alberto Riberi, MD; Gilbert Habib, MD; Didier Raoult, MD, PhD



	Baseline	3 mo	6 mo	9 mo	12 mo
Patients at risk, No.					
Period 1	173	131	126	123	122
Period 2	160	149	148	147	144
Cumulative No. of deaths					
Period 1	0	23	28	30	30
Period 2	0	9	10	11	13

Figure. Kaplan-Meier curve relating survival (percentage [SE]) according to the period of infective endocarditis management (hazard ratio, 0.41; 95% confidence interval, 0.21-0.79 [*P*=.008]).

The overall 1-year mortality significantly decreased from 18.5% during period 1 to 8.2% during period 2 (hazard ratio [HR], 0.41; 95% CI, 0.21-0.79 [P=.008])

Manejo multidisciplinario *"Endocarditis team"*

- **Mortalidad:**

  - **hospitalaria:** 28% vs 13% (p= 0.02)

  - **al año**: 18.5% vs 8.2% (HR 0.41; IC95% 0.21-0.79 [p= .008])

- **Mortalidad quirúrgica:**

  - **en la fase aguda**: 47% to 13% (p ≤0.001)

  - **a los 3 años**: 34% vs 16% (p= 0.0007).

Categoria IB

- El **manejo en equipo** resulto protector (HR 0.26; IC95% 0.09-0.76 [p= .01]).

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Chirillo F y cols. Am J Cardiol 2013;112:1171–1176
Botelho-Nevers E y cols Arch Intern Med 2009;169:1290–1298
ESC y AHA guidelines 2015

CONCLUSIONES FINALES

- Reconocer la enfermedad a tiempo
- Emplear las herramientas de diagnostico apropiadamente
- Interpretar los resultados con juicio clinico
- Administrar tratamiento antibiotico optimo
- Consulta quirúrgica oportuna
- Seguimiento prolongado

TRABAJO EN EQUIPO

ICBA Instituto Cardiovascular de Buenos Aires

Muchas gracias

RFM6

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ICBA Instituto Cardiovascular

Profilaxis antibiótica en Endocarditis Infecciosa (Mitos y realidades)

Pablo Fernández Osés
Serv. de Infectología y Control de infecciones – Instituto Cardiovascular (ICBA)
Centros Dr. Stamboulian

PREGUNTA 4

¿ A que persona le indicaría profilaxis antibiótica para disminuir el riesgo de EI?

A- Pacientes con antecedentes de riesgo para procedimientos invasivos potencialmente bacteriemicos (Ej: biopsia prostática)

B- Pacientes de riesgo previo a procedimientos invasivos odontológicos

C- Frente a todo procedimiento invasivo de riesgo independientemente de los antecedentes del paciente

D- Previo a procedimientos invasivos odontológicos independientemente de los antecedentes del paciente.

HISTORIA

- 1923 Lewis y Grant proponen que la EI podría estar causada por bacteremias 2ª a procedimientos odontológicos. (Heart 1923; 10; 21-77)

- 1955 AHA 1ª guías de profilaxis ATB para EI. (Circulation 1955;11; 317-320)

- Numerosas recomendacion

Evidencia

Pobre

Modelos Animales: D. Durak. 1970. Modelo animal en válvulas dañadas adrede e inoculación de St. Viridans. En el modelo se provocaba EI sobre la válvula dañada. Al repetir el mismo experimento con infusión de ATB previo a la inoculación bacteriana, la infección no ocurría.

Estudios caso-control: 1986 Horstkotte comparó 287 procedimientos odontógenos en pacientes con remplazo valvular bajo profilaxis ATB vs 390 procedimientos similares pero sin profilaxis ATB, también en pacientes con remplazo valvular y observó que en el primer grupo no se produjeron casos de EI, mientras que en el 2º ocurrieron 6 (1,54%)
Otros: Van Der Meer et al (1992) / Laccassin et al (1995) / Strom, et al....

1) Van der Meer JT,. Epidemiology of bacterial endocarditis in The Netherlands. Ii. Antecedent procedures and use of prophylaxis. Arch Intern Med 1992;152:1869e73.
2) Lacassin F, et al. Procedures associated with infective endocarditis in adults. A case control study. Eur Heart J 1995;16:1968e74
3) Strom BL,, et al. Dental and cardiac risk factors for infective endocarditis. A population-based, casecontrol study. Ann Intern Med 1998;129:761e9.

La profilaxis reduce una pequeña proporción de casos

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Profilaxis ATB en EI

2008

- Estados Unidos[1]
- Europa (continental)[2]

- Profilaxis solo en procedimientos odontológicos con compromiso gingival y/o periapical
- Solo pacientes de alto riesgo (EI previa, remplazos valvulares…).
- No profilaxis en otros procedimientos → Génito-urinarios, Gastrointestinales, dermatológicos, etc)

Profilaxis recomendada para procedimientos dentales de alto riesgo en pacientes de alto riesgo

Situación	Antibiótico	Dosis única 30-60 min antes del procedimiento	
		Adultos	Niños
Sin alergia a penicilina o ampicilina	Amoxicilina o ampicilina*	2 g, oral o i.v.	50 mg/kg, oral o i.v.
Alergia a penicilina o ampicilina	Clindamicina	600 mg, oral o i.v.	20 mg/kg, oral o i.v.

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1- AHA Releases Updated Guidelines on the Prevention of Infective Endocarditis.
Am Fam Physician. 2008 Feb 15;77(4):538-545
2- Guidelines on the prevention, diagnosis, and treatment of infective endocarditis (new version 2009)J2009;30:2369–2413.

Profilaxis ATB en EI

2008

- Estados Unidos[1]
- Europa (continental)[2]
- Reino Unido (NICE)[3]

No profilaxis

2016

« No se recomienda la profilaxis con antibióticos contra la endocarditis infecciosa **rutinariamente** para las personas que se someten a procedimientos dentales».

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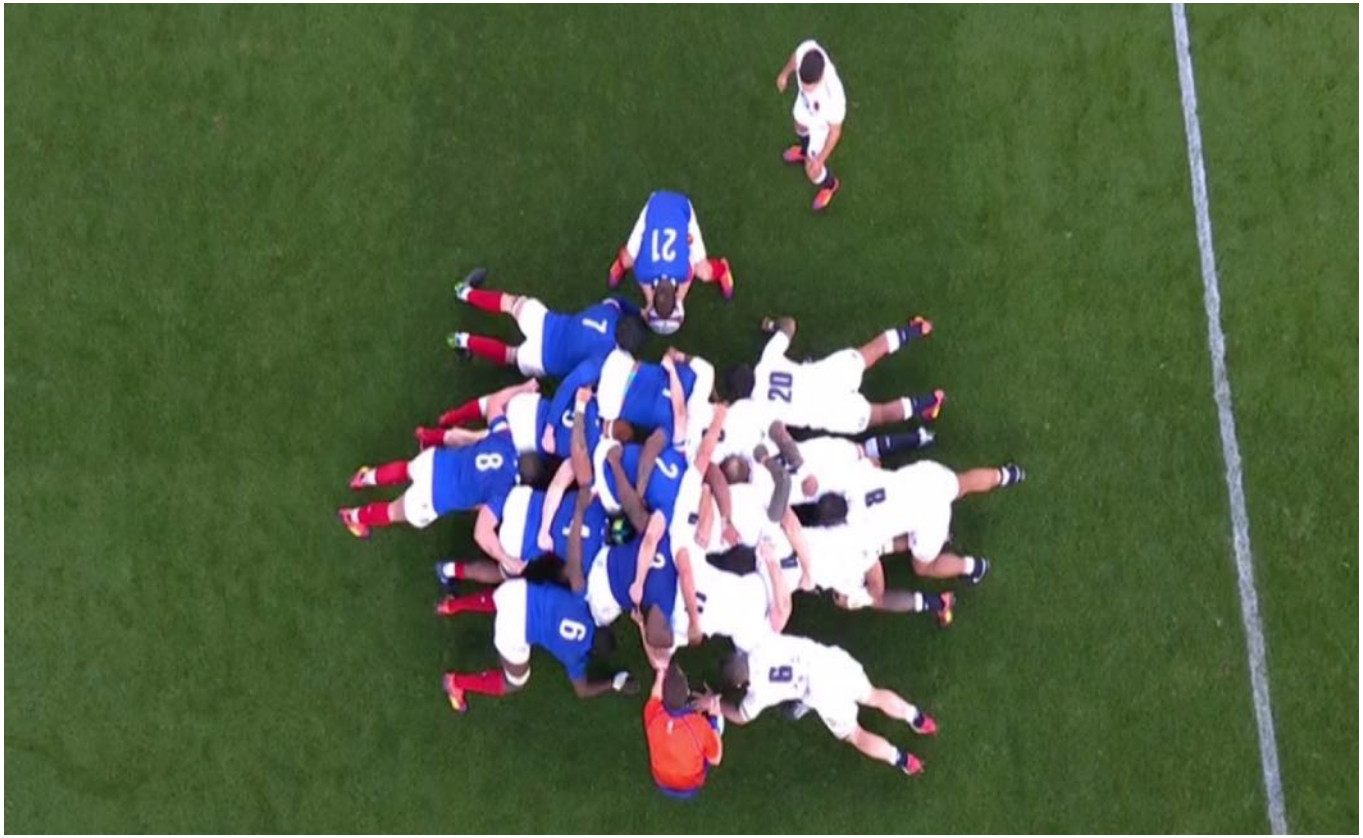
NICE clinical guideline 64 – Prophylaxis against infecti

¿Evidencia, Riesgo, Seguridad, Costo-efectividad?



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Estimated Risk of Endocarditis in Adults with Predisposing Cardiac Conditions Undergoing Dental Procedures With or Without Antibiotic Prophylaxis

Xavier Duval,[1] F. Alla,[2] B. Hoen,[3] F. Danielou,[2] S. Larrieu,[4] F. Delahaye,[5] C. Leport,[1] and S. Briançon[2]

[1]Assistance Publique Hôpitaux de Paris (APHP) Service des Maladies Infectieuses et Tropicales B, Centre Hospitalo-Universitaire (CHU) Bichat Claude Bernard, Université Paris VII, INSERM U 738, Paris, [2]CHU de Nancy, Service d'Epidémiologie et Evaluation Cliniques, Hôpital Marin, Nancy, [3]Service des Maladies Infectieuses et Tropicales, CHU de Besançon, Besançon, [4]Université Victor Segalen Bordeaux 2, Institut de Santé Publique et d'Épidémiologie du Développement (ISPED), INSERM U 593, Bordeaux, and [5]Service de Cardiologie, Hôpital Cardiovasculaire et Pneumologique, Bron, France

Table 2. Estimation of the annual number of infective endocarditis (IE) cases, according to the nature of the involved valve and to the performance of a protected or unprotected dental procedure in France.

Variable	Subjects with native valve PCCs	Subjects with prosthetic valve PCCs	Total
Annual no. of IE cases in adults with known PCCs in France (95% CI)	490 (448–535)	224 (195–255)	714 (663–768)
IE cases possibly related to a dental procedure			
All procedures			
No. (%) of procedures	30 (6)	15 (7)	44
95% CI	13–58	4–38	23–77
No. of protected procedures (95% CI)[a]	0	7 (1–27)	7 (1–27)
No. of unprotected procedures (95% CI)[b]	30 (13–58)	7 (1–27)	37 (18–68)

El riesgo de desarrollar EI fue estimado en 1 en 46.000 procedimientos sin protección (1 en 10.700 en valv. Protésicas y 1 en 54.300 para sujetos con valvulopatías de válvula nativa y

Valvular Heart Disease

Bacteremia Associated With Toothbrushing and Dental Extraction

Peter B. Lockhart, DDS; Michael T. Brennan, DDS, MHS; Howell C. Sasser, PhD; Philip C. Fox, DDS; Bruce J. Paster, PhD; Farah K. Bahrani-Mougeot, PhD

Background—Antibiotic prophylaxis recommendations for the prevention of infective endocarditis are based in part on studies of bacteremia from dental procedures, but toothbrushing may pose a greater threat. The purpose of this study was to compare the incidence, duration, nature, and magnitude of endocarditis-related bacteremia from single-tooth extraction and toothbrushing and to determine the impact of amoxicillin prophylaxis on single-tooth extraction.

Methods and Results—In this double-blind, placebo-controlled study, 290 subjects were randomized to (1) toothbrushing, (2) single-tooth extraction with amoxicillin prophylaxis, or (3) single-tooth extraction with identical placebo. Blood was drawn for bacterial culturing and identification at 6 time points before, during, and after these interventions. The focus of our analysis was on bacterial species reported to cause infective endocarditis. We identified 98 bacterial species, 32 of which are reported to cause endocarditis. Cumulative incidence of endocarditis-related bacteria from all 6 blood draws was 23%, 33%, and 60% for the toothbrushing, extraction-amoxicillin, and extraction-placebo groups, respectively ($P<0.0001$). Significant differences were identified among the 3 groups at draws 2, 3, 4, and 5 (all $P<0.05$). Amoxicillin resulted in a significant decrease in positive cultures ($P<0.0001$).

Conclusions—Although amoxicillin has a significant impact on bacteremia resulting from a single-tooth extraction, given the greater frequency for oral hygiene, toothbrushing may be a greater threat for individuals at risk for infective endocarditis. (*Circulation*. 2008;117:3118-3125.)

Key Words: bacteremia ■ bacteria ■ infective endocarditis ■ valves ■ risk factors

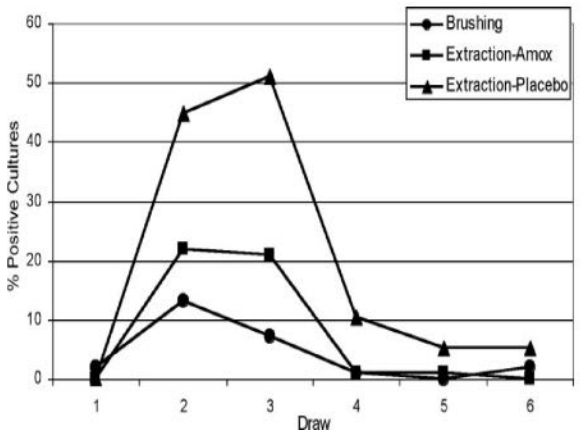
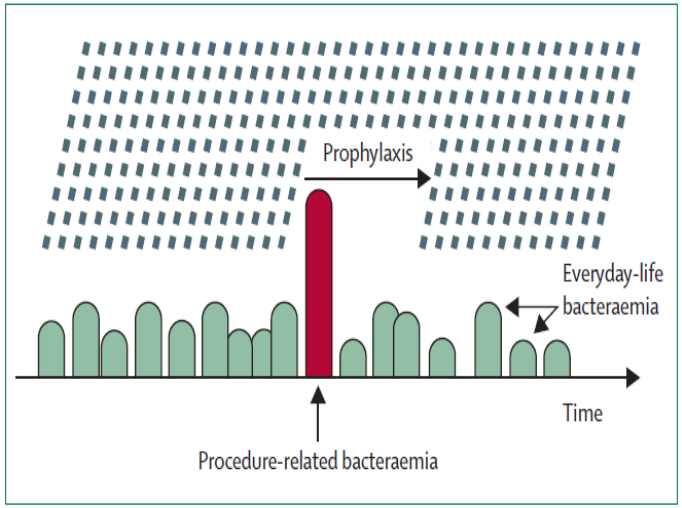


Figure 3. Incidence and duration of bacteremia at 6 time points from IE-related bacterial species. Numbers at the baseline represent the time points for the 6 blood draws: (1) baseline and (2) 1.5 minutes and (3) 5 minutes after initiation of brushing or extraction; and (4) 20 minutes, (5) 40 minutes, and (6) 60 minutes after completion of the brushing or extraction.



- Las extracciones dentales provocan bacteremia en casi el 50% de los casos donde no se usa profilaxis.
- Este porcentaje se reduce al 20% cuando si se realiza PA
- En cada cepillado de dientes → <u>10% de riesgo de bacteremia</u>

700 «cepilladas» por año → Riesgo acumulado >

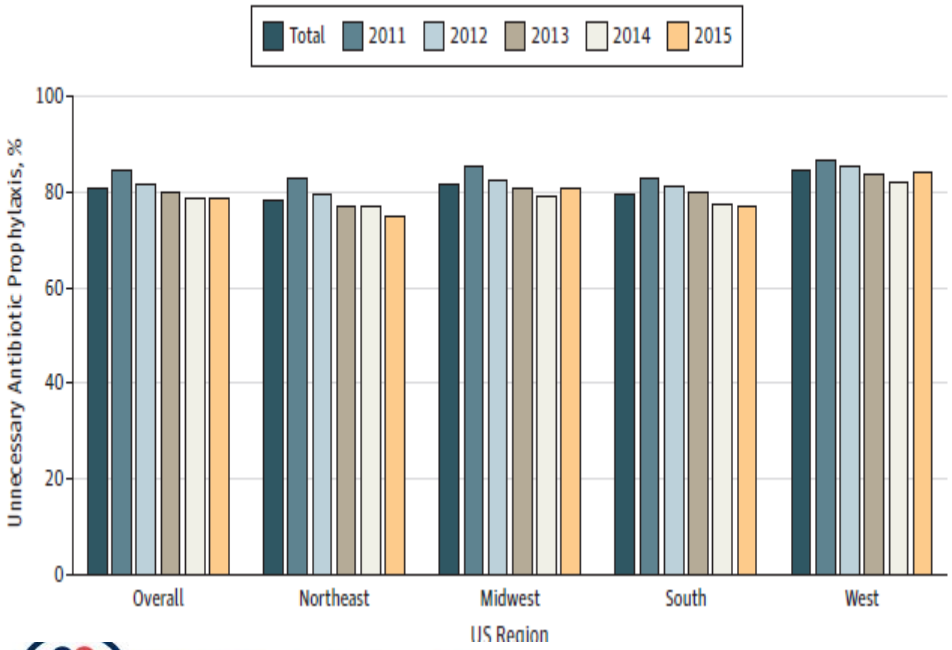
JAMA Network Open

Original Investigation | Infectious Diseases

Assessment of the Appropriateness of Antibiotic Prescriptions for Infection Prophylaxis Before Dental Procedures, 2011 to 2015

Katie J. Suda, PharmD, MS; Gregory S. Calip, PharmD, MPH, PhD; Jifang Zhou, MD, MPH; Susan Rowan, DDS; Alan E. Gross, PharmD, BCPS, BCIDP; Ronald C. Hershow, MD; Rose I. Perez, BS; Jessina C. McGregor, PhD; Charlesnika T. Evans, MPH, PhD

Figure 2. Geographic Variation in Unnecessary Antibiotic Prophylaxis, 2011-2015



Más del 80% de las prescripciones de profilaxis antibiótica antes de los procedimientos dentales fueron innecesarias: Si bien la profilaxis con antibióticos se prescribe de manera apropiada para los procedimientos dentales indicados en pacientes con afecciones cardíacas, la mayoría de la profilaxis con antibióticos se prescribe a pacientes en los que los factores de riesgo identificados por las guías no están presentes.

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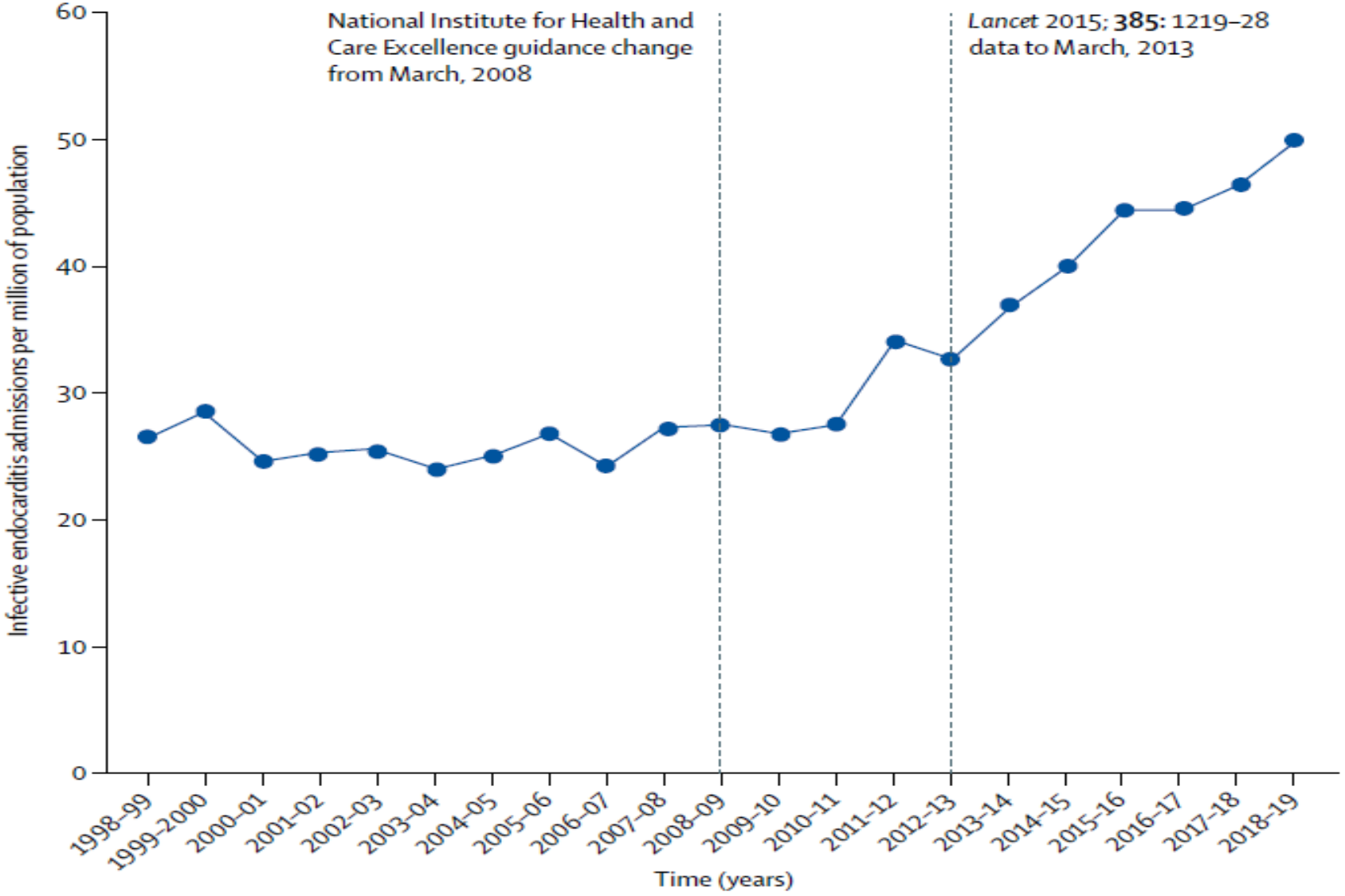
JAMA Network Open. 2019;2(5):e193909. doi:10.1001/jamanetworkopen.2019.3909

Incidencia de EI en el R.U 1998-2019



Contents lists available at ScienceDirect

Quan et al. BMC Medicine (2020) 18:84
https://doi.org/10.1186/s12916-020-01531-y

BMC Medicine

Review Article

Is antibiotic p

Mark Dayer [a,*], M

[a] Taunton and Somerset NHS
[b] Academic Unit of Oral & Ma
United Kingdom

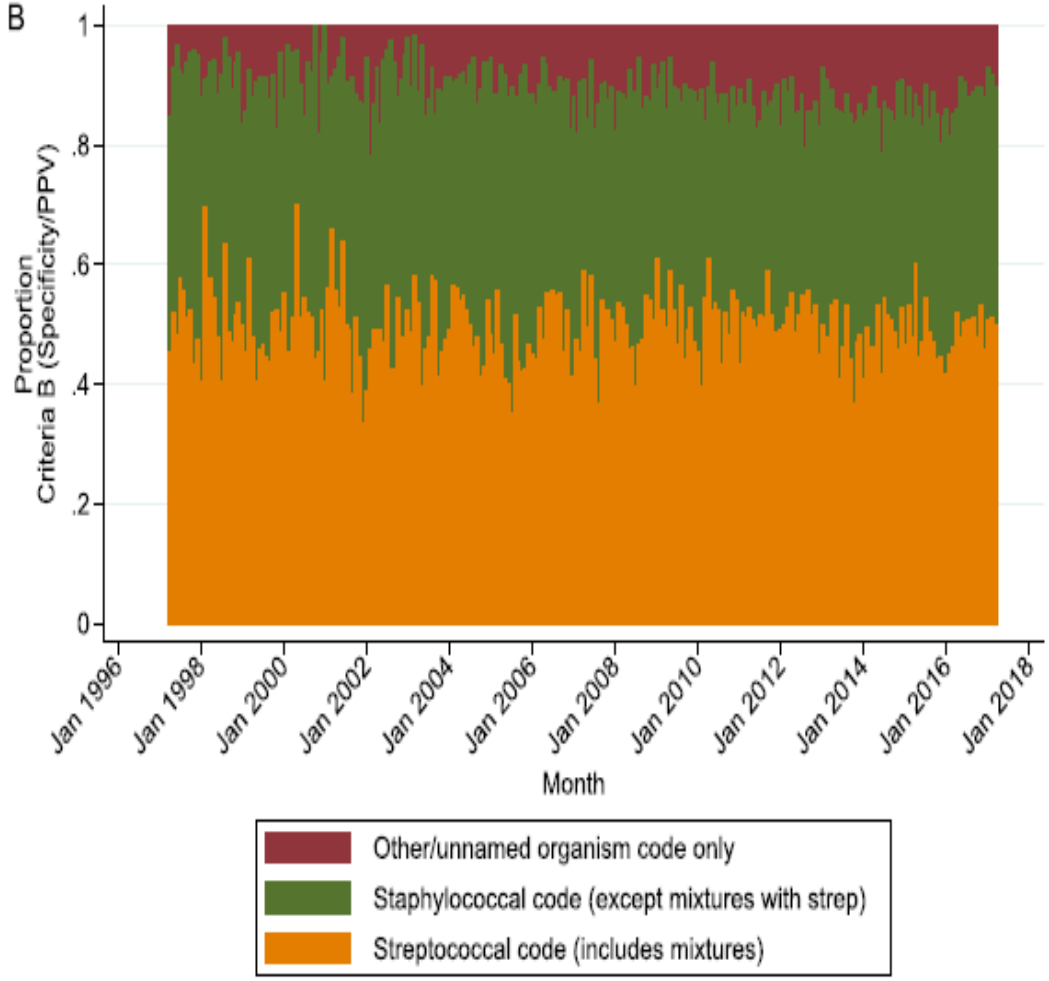
endocarditis in

re invasive dental procedures in
e at risk is a long-held preventive
er, antibiotic prophylaxis remains
nce 2007, international guidelines
nded that antibiotic prophylaxis
cted to patients at the highest risk
omes—ie, those with a history of
rditis, prosthetic or repaired heart
lex congenital heart disease. These
a scarcity of evidence for antibiotic
tiveness, concerns for risk of adverse
and the possibility that antibiotic
ributes to an ever increasing global

RESEARCH ARTICLE Open Access

Investigation of the impact of the NICE guidelines regarding antibiotic prophylaxis during invasive dental procedures on the incidence of infective endocarditis in England: an electronic health records study

T. Phuong Quan[1,2,3*], Berit Muller-Pebody[4], Nicola Fawcett[1,2,5], Bernadette C. Young[2], Mehdi Minaji[4], Jonathan Sandoe[6], Susan Hopkins[4], Derrick Crook[1,2,3,5], Timothy Peto[1,2,3,5], Alan P. Johnson[4†] and A. Sarah Walker[1,2,3†]



La incidencia de EI aumento 22.2–41.3 por million de personas en 1998 a 42.0–67.7 en 2017.

Las EI asociadas con estreptococos orales disminuyeron en proporción después de los cambios en las recomendaciones

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Investigation of the impact of the NICE guidelines regarding antibiotic prophylaxis during invasive dental procedures on the incidence of infective endocarditis in England: an electronic health records study
T. Phuong Quan. Quan et al. BMC Medicine (2020) 18:84

ESC European Society of Cardiology
European Heart Journal (2019) 0, 1–11
doi:10.1093/eurheartj/ehz620

FASTTRACK CLINICAL RESEARCH
Valvular heart disease

Clinical presentation, aetiology and outcome of infective endocarditis. Results of the ESC-EORP EURO-ENDO (European infective endocarditis) registry: a prospective cohort study

Gilbert Habib[1,2]*, Paola Anna Erba[3,4], Bernard Iung[5], Erwan Donal[6], Bernard Cosyns[7], Cécile Laroche[8], Bogdan A. Popescu[9], Bernard Prendergast[10], Pilar Tornos[11], Anita Sadeghpour[12], Leopold Oliver[13], Jolanta-Justina Vaskelyte[14], Rouguiatou Sow[15], Olivier Axler[16], Aldo P. Maggioni[17], and Patrizio Lancellotti[18,19,20]; on behalf of the EURO-ENDO Investigators†

- n: 3116 pacientes (30% protesis y 10 % MCP/CDI)
- 33% nosocomiales
- Solo 7.9% relacionada a procedimientos odontológicos
- *S. aureus* 44%
- Streptococos orales < 15%

↓

Pacientes de «moderado riesgo»
(Prolapso Mitral, Ao Bicuspide)

NO SON ALCANZADOS POR LAS GUIAS ACTUALES

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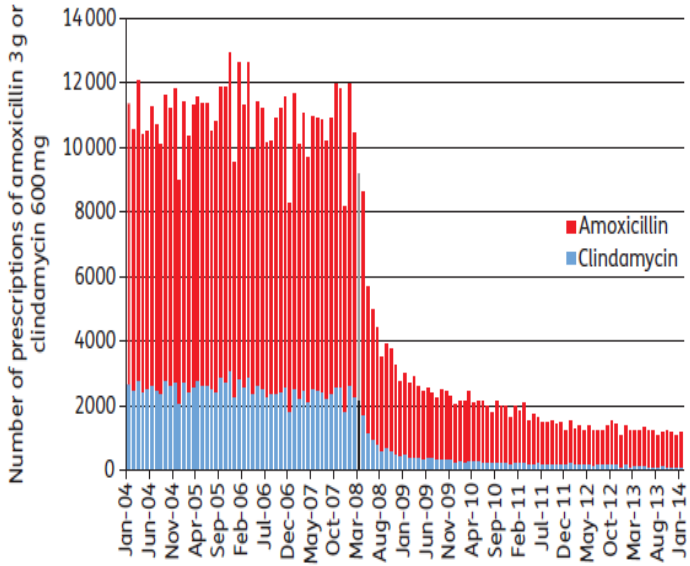
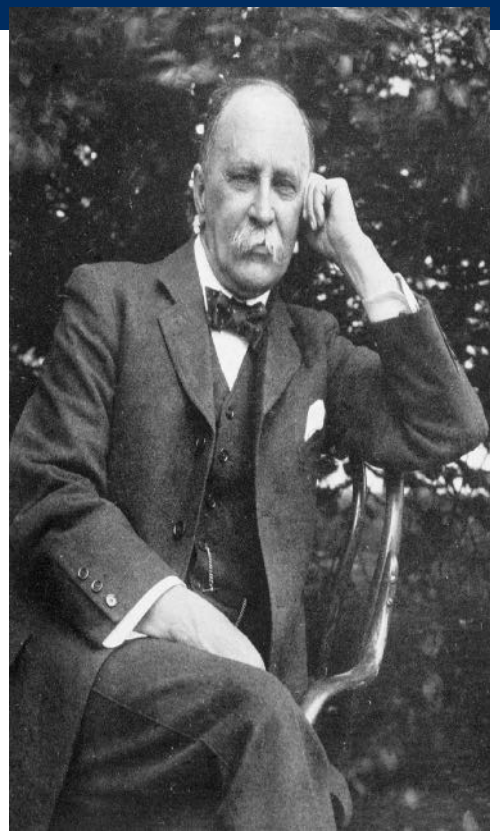
Profilaxis ATB: impacto de las guías NICE 2008

¿Qué impacto tendría la NO indicación de profilaxis





En el Reino Unido, la prescripción de ATB para profilaxis disminuyó drásticamente de 10.900 a 2230 prescripciones por mes (p<0.0001) desde que el NICE modifico las guías de profilaxis de Endocarditis infecciosa (EI) en marzo de 2008

Incidence of infective endocarditis in England, 2000–13: a secular trend, interrupted time-series analysis
Mark J Dayer Ph D et all. The Lancet Volume 385, Issue 9974, 28 March–3 April 2015, Pages 1219-1228

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J Antimicrob Chemother 2015; **70**: 2382–2388
doi:10.1093/jac/dkv115 Advance Access publication 29 April 2015

Journal of Antimicrobial Chemotherapy

Incidence and nature of adverse reactions to antibiotics used as endocarditis prophylaxis

Martin H. Thornhill[1,2]*, Mark J. Dayer[3], Bernard Prendergast[4], Larry M. Baddour[5], Simon Jones[6] and Peter B. Lockhart[2]

[1]Unit of Oral and Maxillofacial Surgery and Medicine, University of Sheffield School of Clinical Dentistry, Claremont Crescent, Sheffield S10 2TA, UK; [2]Department of Oral Medicine, Carolinas Medical Center, Charlotte, NC 28203, USA; [3]Department of Cardiology, Taunton and Somerset NHS Trust, Taunton, Somerset TA1 5DA, UK; [4]Department of Cardiology, John Radcliffe Hospital, Oxford OX3 9DU, UK; [5]Division of Infectious Diseases, Mayo Clinic College of Medicine, Rochester, MN 55905, USA; [6]School of Health Sciences, University of Surrey, Guildford, Surrey GU2 7XH, UK

- Con el uso de amoxicilina, las tasas de efectos adversos son bajos, sin eventos fatales registrados para casi 3 millones de prescripciones de 3 g de amoxicilina en una dosis oral única y 22.62 no fatales reportadas por millón.
- Por el contrario, el uso de clindamicina se asoció con una tasa de efectos adversos considerables, incluidos 13 informes de casos fatales y 149 no fatales por millón de prescripciones, la mayoría relacionadas con la infección por C. difficile.

Circulation

AHA SCIENTIFIC STATEMENT

Prevention of Viridans Group Streptococcal Infective Endocarditis

A Scientific Statement From the American Heart Association

Table 5. Antibiotic Regimens for a Dental Procedure Regimen: Single Dose 30 to 60 Minutes Before Procedure

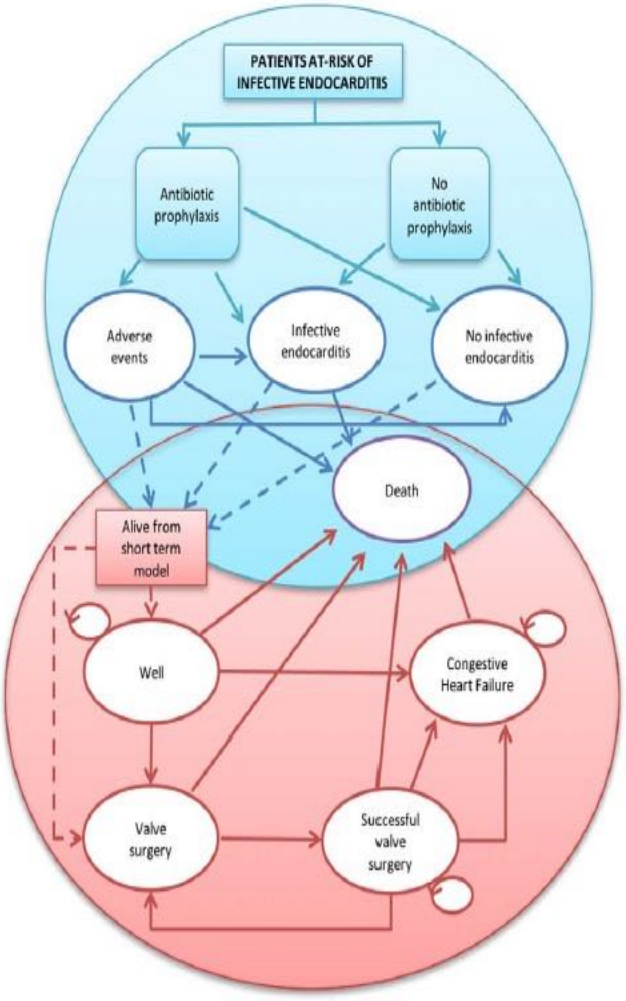
Situation	Agent	Adults	Children
Oral	Amoxicillin	2 g	50 mg/kg
Unable to take oral medication	Ampicillin OR cefazolin or ceftriaxone	2 g IM or IV	50 mg/kg IM or IV
		1 g IM or IV	50 mg/kg IM or IV
Allergic to penicillin or ampicillin—oral	Cephalexin* OR azithromycin or clarithromycin OR doxycycline	2 g	50 mg/kg
		500 mg 100 mg	15 mg/kg <45 kg, 4.4 mg/kg >45 kg, 100 mg
Allergic to penicillin or ampicillin and unable to take oral medication	Cefazolin or ceftriaxone†	1 g IM or IV	50 mg/kg IM or IV

Circulation. 2021;143:00–00. DOI: 10.1161/CIR.0000000000000969

ORIGINAL RESEARCH ARTICLE

The Cost-Effectiveness of Antibiotic Prophylaxis for Patients at Risk of Infective Endocarditis

Matthew Franklin, PhD
Allan Wailoo, PhD
Mark J. Dayer, MBBS, PhD
Simon Jones, PhD
Bernard Prendergast, DM
Larry M. Baddour, MD
Peter B. Lockhart, DDS
Martin H. Thornhill, MBBS, BDS, PhD



What Are the Clinical Implications?

- If AP was reinstated in England for those at moderate or high risk of IE, it could save £5.5 to £8.2 million ($7.3–$10.9 million; €6.6–€9.8 million) and result in health gains >2600 quality-adjusted life-years per year.
- AP is even more cost-effective for those at high risk of IE. Restricting AP to those at high risk would result in cost savings of £4.0 million ($5.32 million; €4.8 million) and health gains of >1070 quality-adjusted life-years per year in England because of the smaller number of individuals at high risk.
- These findings support the cost-effectiveness of guidelines recommending AP use, in particular, in high-risk individuals.

Circulation. 2016; 134. 1568-1578.

Tanto amoxicilina como clindamicina se asociaron con menores costos y mejores resultados de salud fundamentalmente para las poblaciones de alto riesgo.
La PA generaría ahorros de $ 7,3 millones a $ 10,9 millones por año)

Guidelines on prophylaxis to prevent infective endocarditis

M. H. Thornhill,*[1] M. Dayer,[2] P. B. Lockhart,[3] M. McGurk,[4] D. Shanson,[5] B. Prendergast[6] and J. B. Chambers[7]

OPINION

IN BRIEF

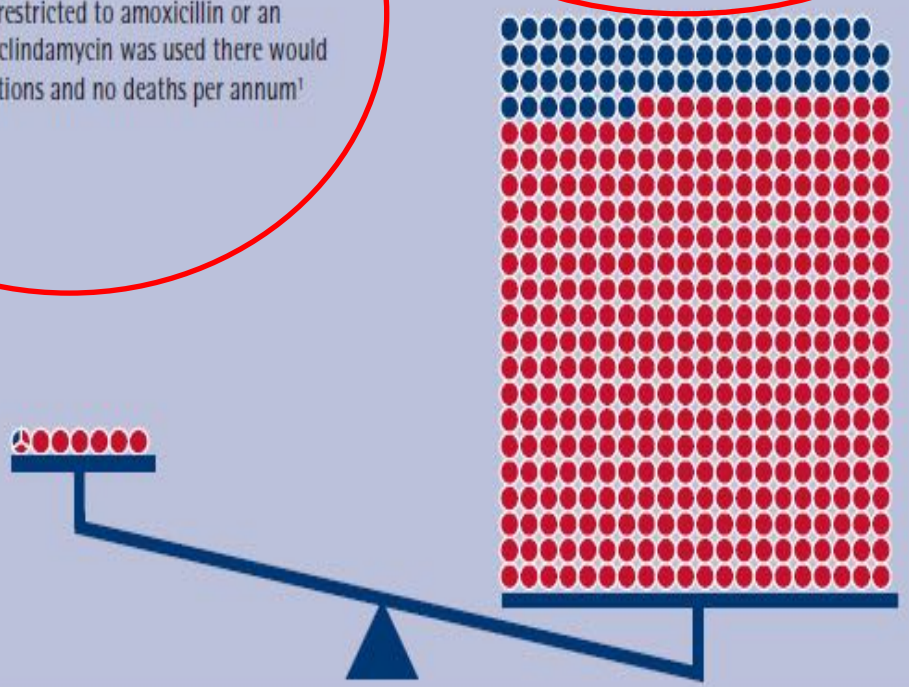
- Describes the outcome of two important new guideline reviews with conflicting advice regarding the use of antibiotic prophylaxis to prevent infective endocarditis (IE).
- Provides guidance for dentists who are managing patients at risk of IE in the current climate of conflicting guidance and the new legal requirements on obtaining informed consent.

ESC guidance recommending AP

- Could result in an extra 7 adverse drug reactions a year
- Including 1 death every 3 years
- But if AP was restricted to amoxicillin or an alternative to clindamycin was used there would be only 2 reactions and no deaths per annum[1]

NICE guidance recommending no AP

- Could result in an extra 419 IE cases a year
- Including 66 deaths



JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY VOL. 80, NO. 11, 2022

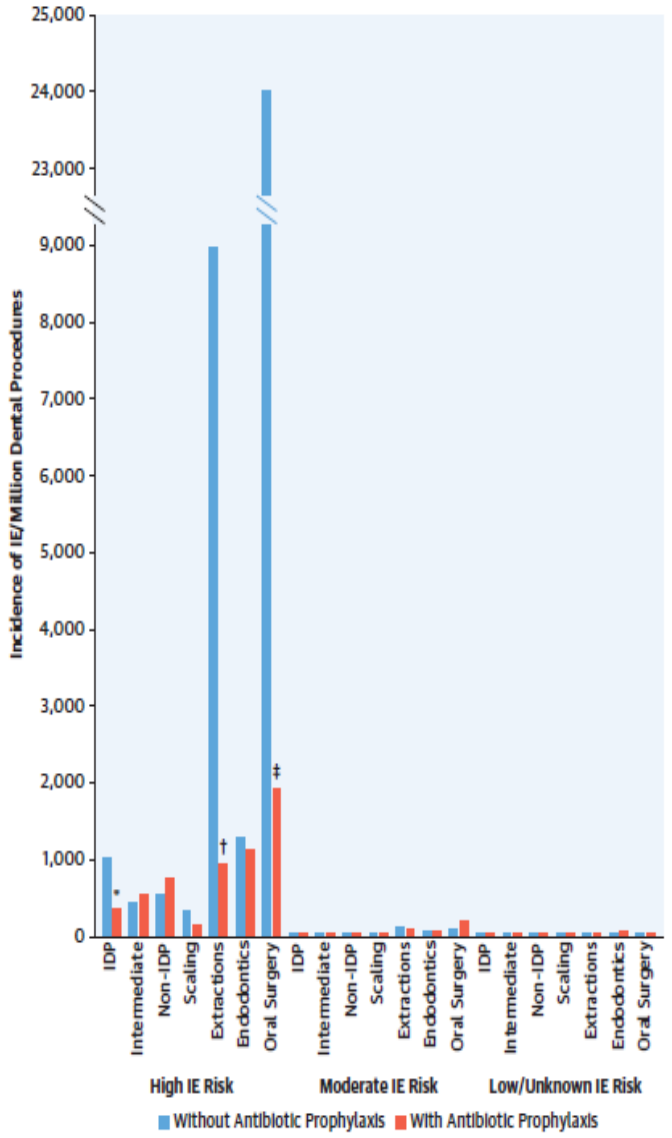
PUBLISHED BY ELSEVIER

ORIGINAL INVESTIGATIONS

Antibiotic Prophylaxis Against Infective Endocarditis Before Invasive Dental Procedures

Martin H. Thornhill, MBBS, BDS, PhD,[a,b] Teresa B. Gibson, PhD,[c] Frank Yoon, PhD,[c] Mark J. Dayer, MBBS, PhD,[d] Bernard D. Prendergast, BM, BS, DM,[e] Peter B. Lockhart, DDS,[b] Patrick T. O'Gara, MD,[f] Larry M. Baddour, MD[g]

CENTRAL ILLUSTRATION Infective Endocarditis Incidence Within 1 Month of Dental Procedures Performed With or Without Antibiotic Prophylaxis



Thornhill et al JACC VOL. 80, NO. 11, 2022. Antibiotic Prophylaxis for Dental Procedures s e p t e m b e r 1 3 , *2 0 2 2 : 1 0 2 9 – 1 0 4 1*

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- Demostró una asociación temporal significativa entre la EI y procedimientos odontológicos invasivos las 4 semanas anteriores (OR: 2,00; IC 95%: 1,59-2,52; P = 0,002).
- Esta relación fue más fuerte para las extracciones dentales (OR: 11,08; IC del 95 %: 7.34-16.74; P < 0,0001) y procedimientos quirúrgicos orales (OR: 50,77; IC 95%: 20,79-123,98; P < 0,0001).
- AP estaba asociado con una reducción significativa en la incidencia de EI después de IDP (OR: 0,49; IC 95%: 0,29-0,85; P= 0,01).
- El estudio de cohorte confirmó las asociaciones entre EI y extracciones o procedimientos quirúrgicos orales en aquellos con alto riesgo de EI y el efecto de AP en la reducción de estas asociaciones (extracciones: OR: 0,13; IC 95%: 0,03-0,34; P < 0,0001; procedimientos quirúrgicos orales: OR: 0,09; IC 95%: 0,01-0,35; P = 0,002).

¿En qué pacientes utilizar profilaxis antibiótica?

Pacientes de alto riesgo

- EI Previa
- Prótesis valvulares (Incluida TAVI)
- Cardiopatías congénitas cianóticas
- Trasplantado con valvulopatía

Procedimientos odontológicos invasivos

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CONCLUSIONES

- La evidencia en cuanto a la eficacia de la PA para disminuir el número de EI es pobre. No hay estudios randomizados (probablemente nunca los haya)

- En todas las series el *S. aureus* es el agente más frecuente (No es blanco de la profilaxis)

- Los «Streptococos orales» representan entre 15- 30 % de los casos y habitualmente afectan a grupos de «mediano riesgo», por lo cual es fundamental insistir en el cuidado de la higiene de la cavidad oral en esta población y evaluar individualmente, situaciones no contempladas en las guías.

- Es tal el impacto de la enfermedad en cuanto a morbi-mortalidad en pacientes de riesgo , sumado a la seguridad de la estrategia y la variable costo-efectiva que resulta recomendable la utilización de PA para disminuir la incidencia de EI.

- Los esfuerzos para reducir la incidencia de EI, deben incluir medidas de cuidado para disminuir las infecciones asociadas a los cuidados de la salud, que representan casi un tercio de las causas de EI sumado al cuidado permanente de la cavidad oral, cuidados de heridas, etc