



**DIU Infections ostéo-articulaires
Lyon, décembre 2022**

Place de la rifampicine dans les IOA

Dr. Florent Valour

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Maladies infectieuses et tropicales

Centre de Référence inter-régional pour la prise en charge des IOA complexes

Hospices Civils de Lyon

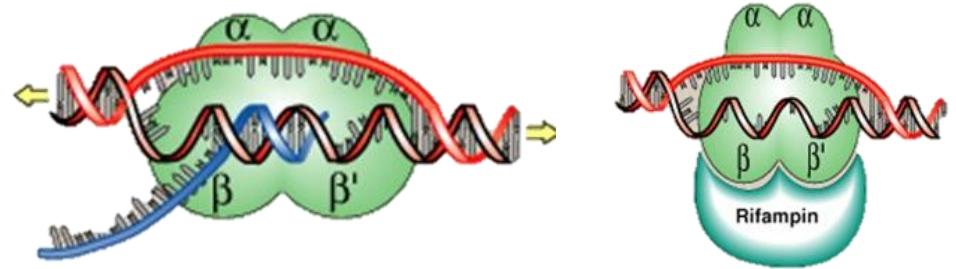
INSERM U1111 – Centre International de Recherche en Infectiologie

Université Claude Bernard Lyon 1

Rifampicine : rappels



Cible : sous-unité B de l'ARN polymérase – Inhibition de la synthèse d'ARN bactérien
Action bactéricide [C]dpdte



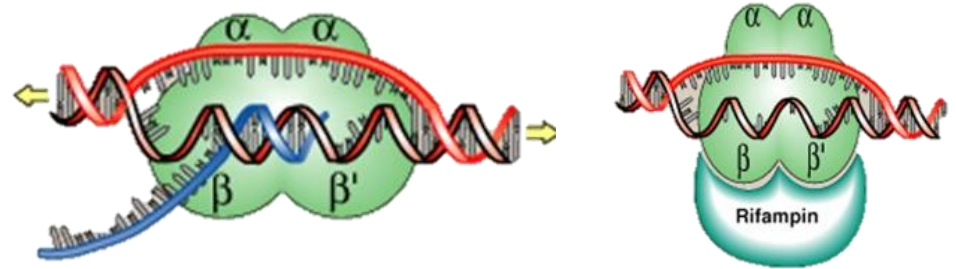
Rifampicine : rappels



Cible : sous-unité B de l'ARN polymérase – Inhibition de la synthèse d'ARN bactérien
Action bactéricide [C]dpdte



Gram+ et intracellulaires



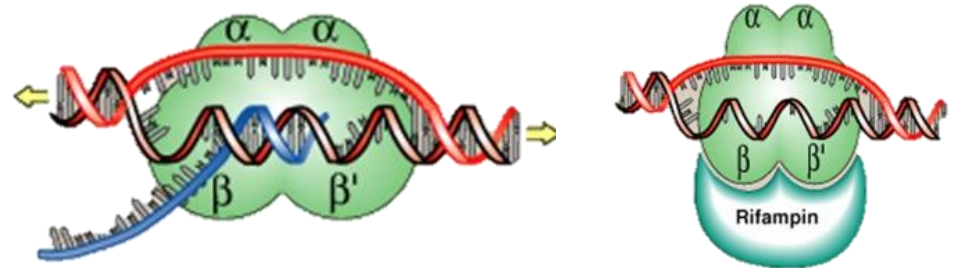
Rifampicine : rappels



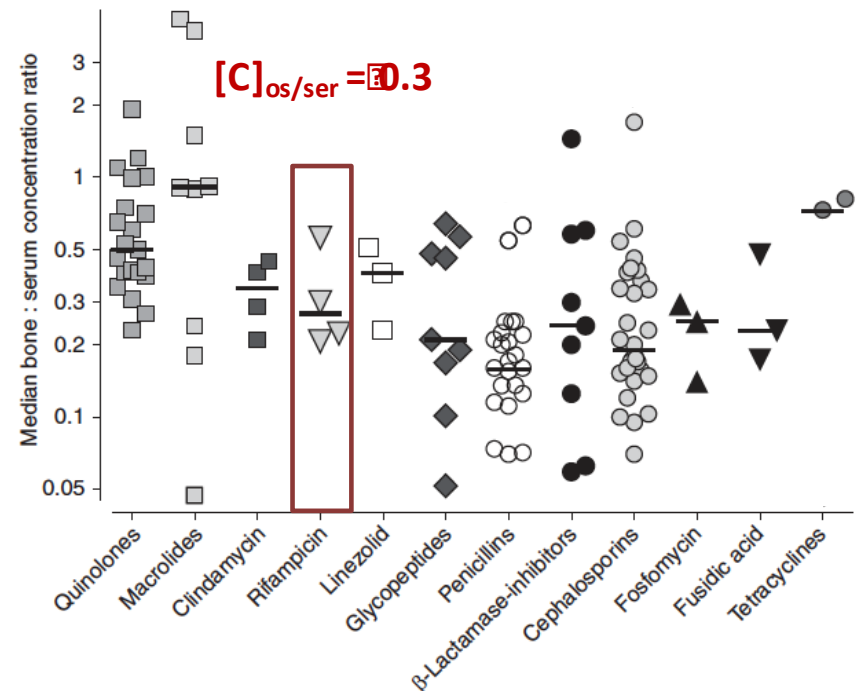
Cible : sous-unité B de l'ARN polymérase – Inhibition de la synthèse d'ARN bactérien
Action bactéricide [C]dpdte



Gram+ et intracellulaires



Biodisponibilité > 90% (si prise à jeun : +30%)
Diffusion tissulaire +++ dont osseuse



Rifampicine : rappels



Cible : sous-unité B de l'ARN polymérase – Inhibition de la synthèse d'ARN bactérien
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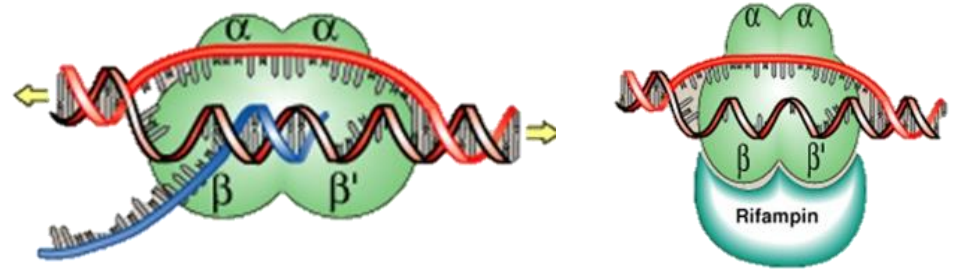
Gram+ et intracellulaires



Biodisponibilité > 90% (si prise à jeun : +30%)
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A UTILISER EN ASSOCIATION



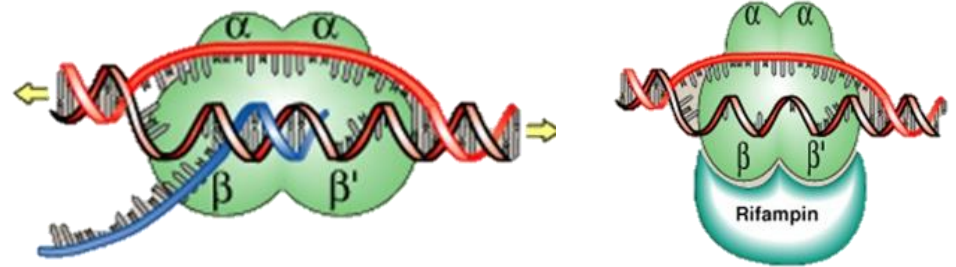
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Gram+ et intracellulaires



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Diffusion tissulaire +++ dont osseuse



A UTILISER EN ASSOCIATION



TOLERANCE



< 0.3%



10%



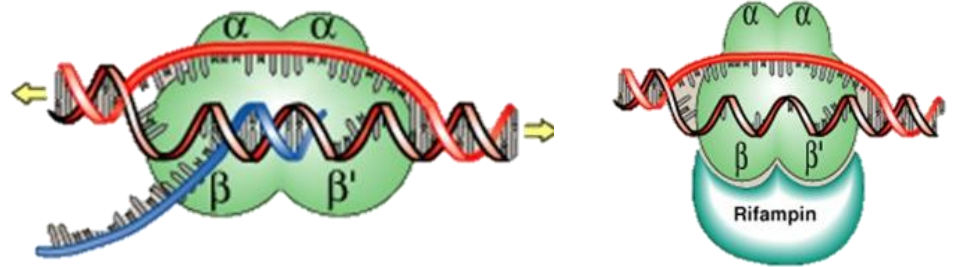
Rifampicine : rappels



Cible : sous-unité B de l'ARN polymérase – Inhibition de la synthèse d'ARN bactérien
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Gram+ et intracellulaires



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A UTILISER EN ASSOCIATION



TOLERANCE



< 0.3%



10%



Puissant inducteur enzymatique +++
CYP3A4



Rifampicine et IOA staphylococciques

Rationnel #1 : action anti-staphylococcique

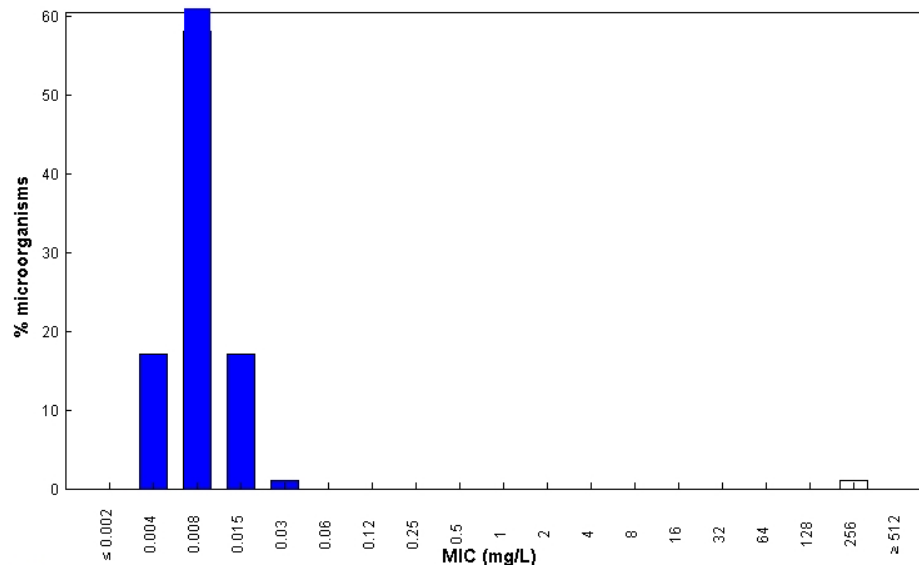


S. aureus

1194 souches

RMP-S (CMI ≤ 0.64 mg/L) : 94.7%

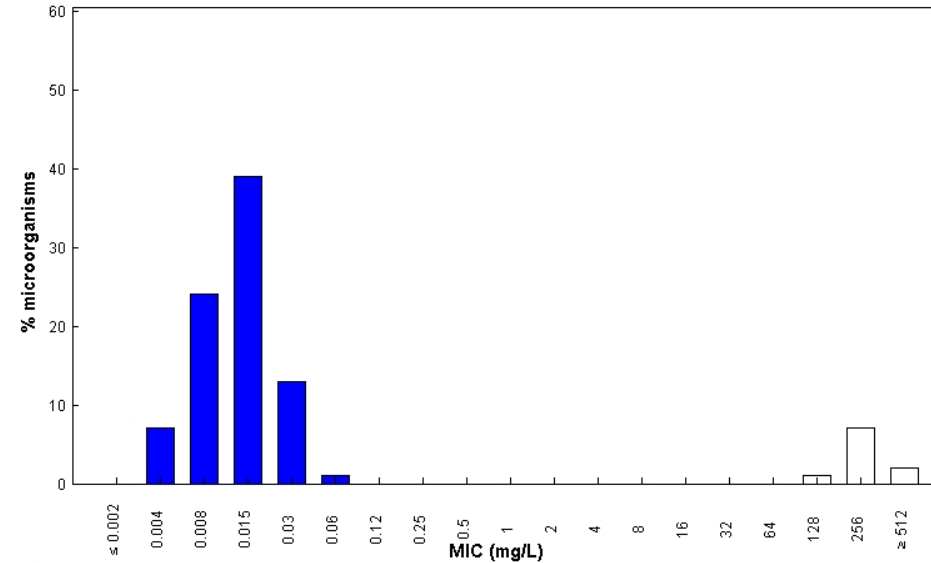
MRSA : 310/317 (97.8%)



SCN

697 souches

RMP-S (CMI ≤ 0.64 mg/L) : 87.5%



Rationnel #2 : action « anti-biofilm »

Minireview – AAC01746-18R – October 27, 2018

The Role of Rifampin against Staphylococcal Biofilm Infections *in Vitro*, in Animal Models, and in Orthopedic Device-Related Infections.

Werner Zimmerli,¹ Parham Sendi^{2,3}

Rationnel #2 : action « anti-biofilm »

ANTIMICROBIAL AGENTS AND CHEMOTHERAPY, Mar. 2002, p. 900-903
0066-4804/02/\$04.00+0 DOI: 10.1128/AAC.46.3.900-903.2002
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Vol. 46, No. 3

Penetration of Rifampin through *Staphylococcus epidermidis* Biofilms

Zhilan Zheng and Philip S. Stewart*

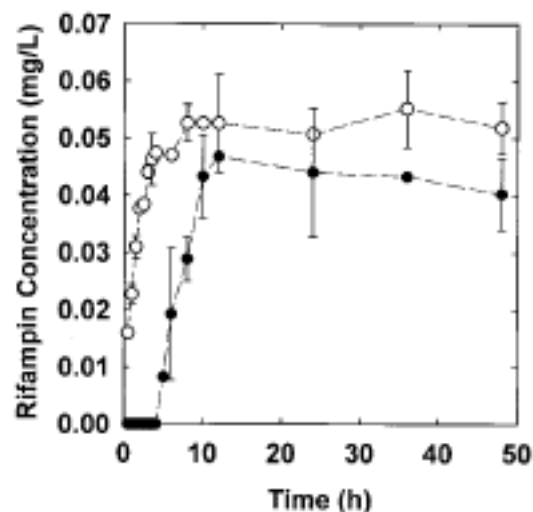


FIG. 1. Penetration of 0.1 μ g of rifampin per ml through membrane assemblies with (filled symbols) and without (open symbols) *S. epidermidis* colony biofilms. Error bars indicate the standard errors of the means.

ANTIMICROBIAL AGENTS AND CHEMOTHERAPY, Jan. 2006, p. 55-61
0066-4804/06/\$08.00+0 doi:10.1128/AAC.50.1.55-61.2006
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Vol. 50, No. 1

Multiple Combination Bactericidal Testing of Staphylococcal Biofilms from Implant-Associated Infections

Raphael Saginur,^{1,2*} Melissa St. Denis,^{2,3} Wendy Ferris,^{2,3} Shawn D. Aaron,^{1,2} Francis Chan,^{2,3} Craig Lee,^{1,2} and Karam Ramotar^{1,2}

TABLE 5. Number of staphylococcus isolates susceptible to single antibiotics

Drug ^a	<i>S. epidermidis</i> (n = 17)				MSSA (n = 11)				MRSA (n = 12)			
	Planktonic		Biofilm		Planktonic		Biofilm		Planktonic		Biofilm	
	Inhibit	Kill	Inhibit	Kill	Inhibit	Kill	Inhibit	Kill	Inhibit	Kill	Inhibit	Kill
LZD	17	0	0	0	11	0	0	0	12	0	1	0
RIF	16	8	1	8	11	3	1	2	10	0	3	5
CFZ	9	1	0	0	11	3	3	0	1	0	0	0
OXA	0	0	0	0	11	2	1	0	0	0	0	0
VAN	17	7	2	0	11	1	2	0	12	1	4	0
GEN	5	4	0	0	4	2	0	0	4	1	0	0
AZM	4	0	0	0	8	0	0	0	1	0	0	0
CIP	0	0	0	0	7	4	1	0	2	1	0	0
FA	14	0	1	1	11	1	0	0	9	0	3	1

Antibiotics	Inhibition of biofilm formation (adhesion)	Biofilm penetration	Bactericidal activity in biofilm
Vancomycin	+	++ ^{16,17}	+ ^{16,17}
Linezolid	+	++ ^{24,29}	+ ²⁴
Daptomycin	+	+++ ¹⁵	++ ^{21,24}
Rifampicin	+	+++ ^{8,16,18}	++ ^{16,30}
Moxifloxacin	+	+++ ²¹	++ ^{21,31}
Rifampicin + daptomycin	+	+++ ^{2,30}	+++ ^{28,30}
Rifampicin + vancomycin	+	++ ^{16,18}	++ ^{16,27,32}
Rifampicin + linezolid	+	+++ ^{16,29}	+++ ^{27,32}

Jacqueline
JAC 2014

ANTIMICROBIAL AGENTS AND CHEMOTHERAPY, Mar. 2011, p. 1182-1186
0066-4804/11/\$12.00 doi:10.1128/AAC.00740-10
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Vol. 55, No. 3

Treatment with Linezolid or Vancomycin in Combination with Rifampin Is Effective in an Animal Model of Methicillin-Resistant *Staphylococcus aureus* Foreign Body Osteomyelitis^V

Paschalis Vergidis,¹ Mark S. Rouse,² Gorane Euba,^{1†} Melissa J. Karau,² Suzannah M. Schmidt,² Jayawant N. Mandrekar,³ James M. Steckelberg,¹ and Robin Patel^{1,2*}

ANTIMICROBIAL AGENTS AND CHEMOTHERAPY, Oct. 2011, p. 4589-4593
0066-4804/11/\$12.00 doi:10.1128/AAC.00675-11
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Vol. 55, No. 10

Adjunctive Rifampin Is Crucial to Optimizing Daptomycin Efficacy against Rabbit Prosthetic Joint Infection Due to Methicillin-Resistant *Staphylococcus aureus*^{V†}

Azzam Saleh-Mghir,^{1,2} Claudette Muller-Serieys,³ Aurélien Dinh,^{1,2} Laurent Massias,⁴ and Anne-Claude Crémieux^{1,2*}

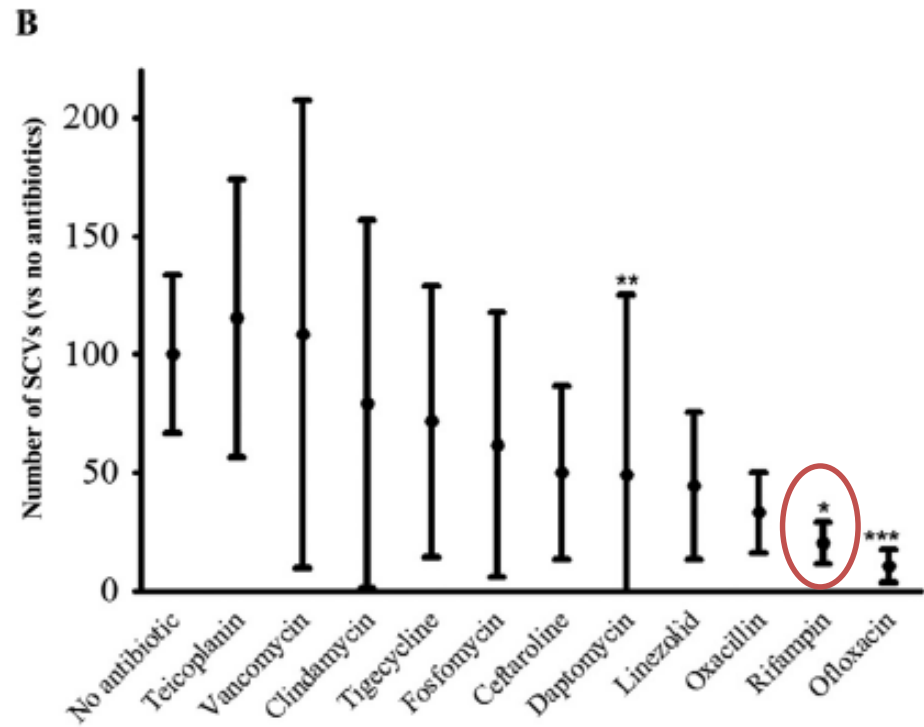
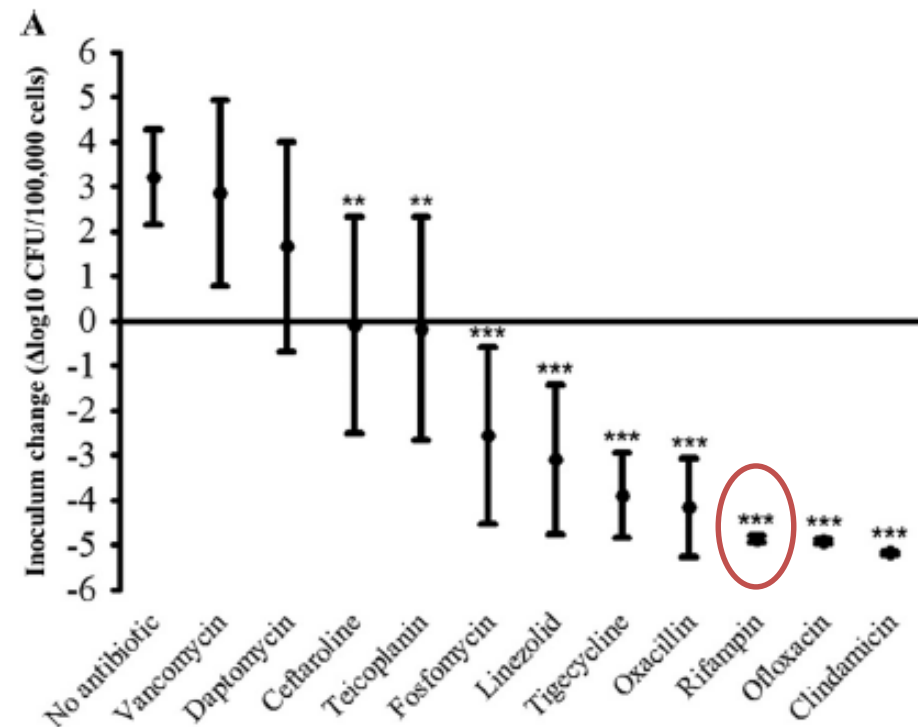
Rationnel #3 : activité intracellulaire

AAC 2015
Journals.ASM.org

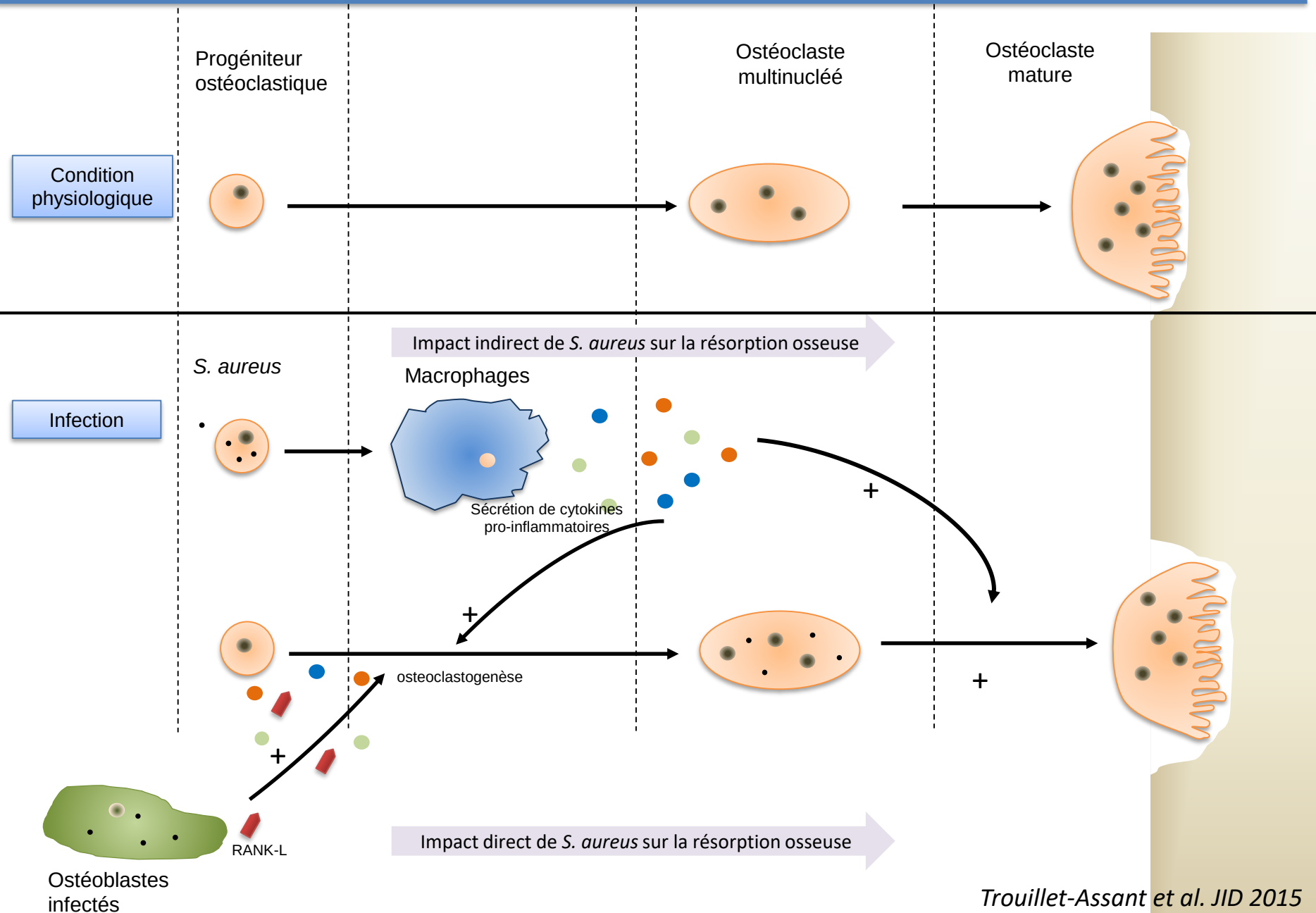
Antimicrobial Activity against Intraosteoblastic *Staphylococcus aureus*

Florent Valour,^{a,b} Sophie Trouillet-Assant,^b Natacha Riffard,^b Jason Tasse,^b Sacha Flammier,^b Jean-Philippe Rasigade,^{b,c} Christian Chidiac,^{a,b} François Vandenesch,^{b,c,d} Tristan Ferry,^{a,b} Frédéric Laurent,^{b,c,d} on behalf of the Lyon Bone and Joint Infection Study Group

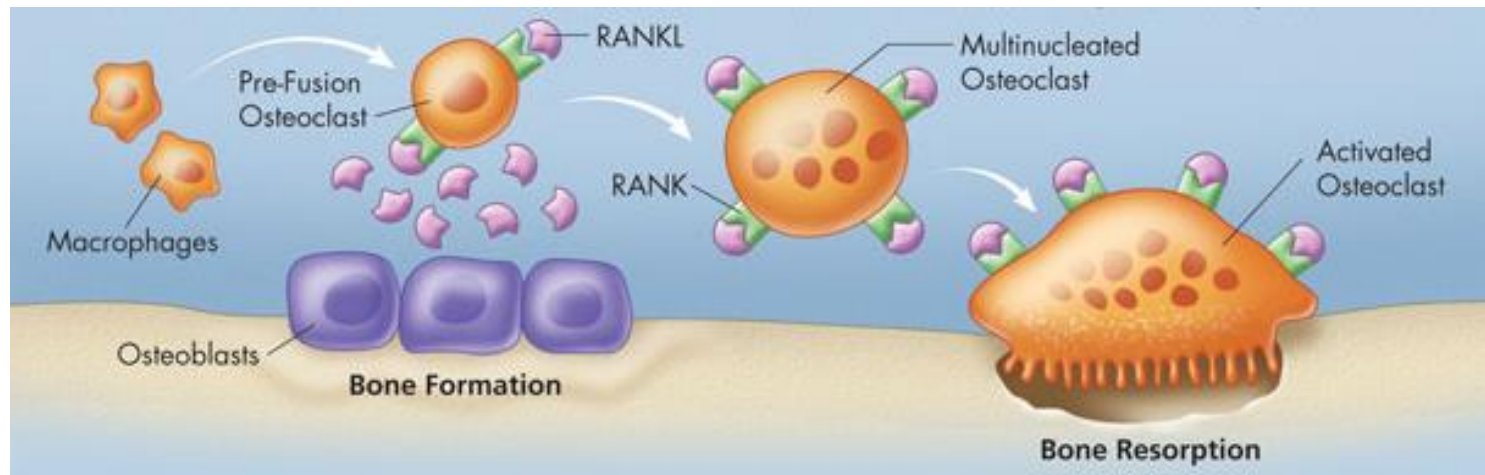
$$C_{os} = 6 \text{ mg/L}$$



Rationnel #4 : action anti-ostéoclastique



Rationnel #4 : action anti-ostéoclastique



Rifampin suppresses osteoclastogenesis and titanium particle-induced osteolysis via modulating RANKL signaling pathways

Liang Zhu^{a,b,1}, Hui Kang^{b,1}, Chang-an Guo^a, Wen-shuai Fan^a, Yi-ming Wang^a, Lian-fu Deng^b, Zuo-qin Yan^{a,*}

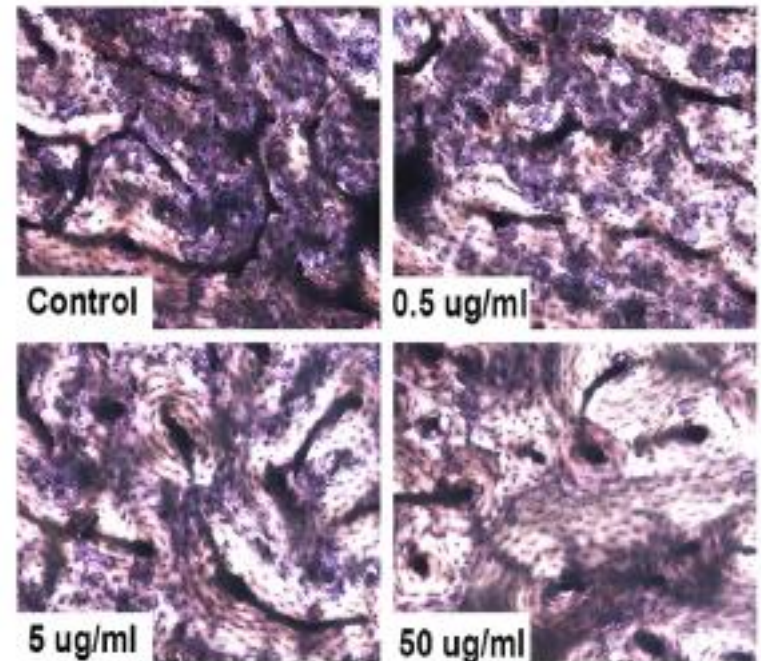
Bioch Bioph Res, 2017

Contexte de descellement aseptique

Particules titane : ↗ ostéoclasie

Rifampicine

- Inhibition de l'ostéoclastogénèse *in vivo*
- Inhibition de la résorption osseuse induite par les particules de titane *in vivo*
- Mécanisme : inhibition du signal transduit par RANK-L



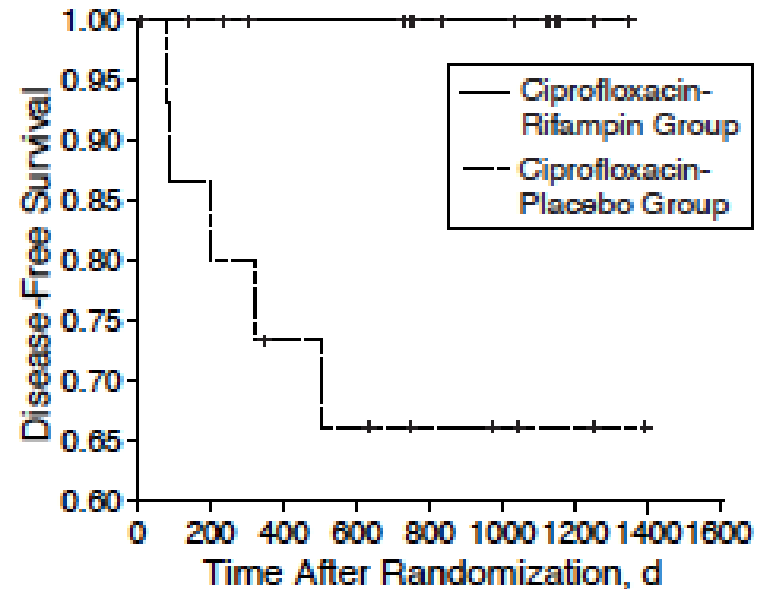
Supériorité clinique

Role of Rifampin for Treatment of Orthopedic Implant-Related Staphylococcal Infections

A Randomized Controlled Trial

Werner Zimmerli, MD; Andreas F. Widmer, MD, MSc; Marianne Blatter, MD; R. Frei, MD; Peter E. Ochsner, MD; for the Foreign-Body Infection (FBI) Study Group

JAMA 1998



Essai clinique randomisé

33 patients, infection aigue sur matériel à SA

Débridement puis

- 2 semaines (péni M ou vanco) IV + (RMP ou placebo)
- Relais
ou cipro + RMP n= 18 cure rate = 100%
cipro + placebo n= 15 cure rate = 58%

Supériorité clinique

Outcome and Predictors of Treatment Failure in Total Hip/Knee Prosthetic Joint Infections Due to *Staphylococcus aureus*

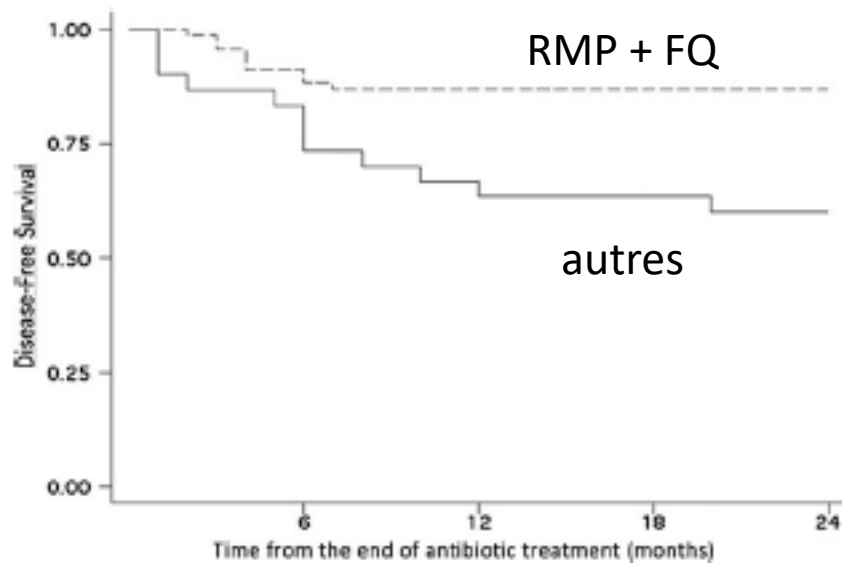
Eric Senneville, Donatienne Joulie, Laurence Legout, Michel Valette, Hervé Dezègue, Eric Beltrand, Bernadette Roselée, Thibaud d'Escrivan, Caroline Loiez, Michèle Caillaux, Yazdan Yazdanpanah, Carlos Maynou, and Henri Migaud

CID 2011

98 patients

Analyse multivariée

- ASA score
- Rifampicine + FQ (OR = 0.40)



75% success rate after open debridement, exchange of tibial insert, and antibiotics in knee prosthetic joint infections

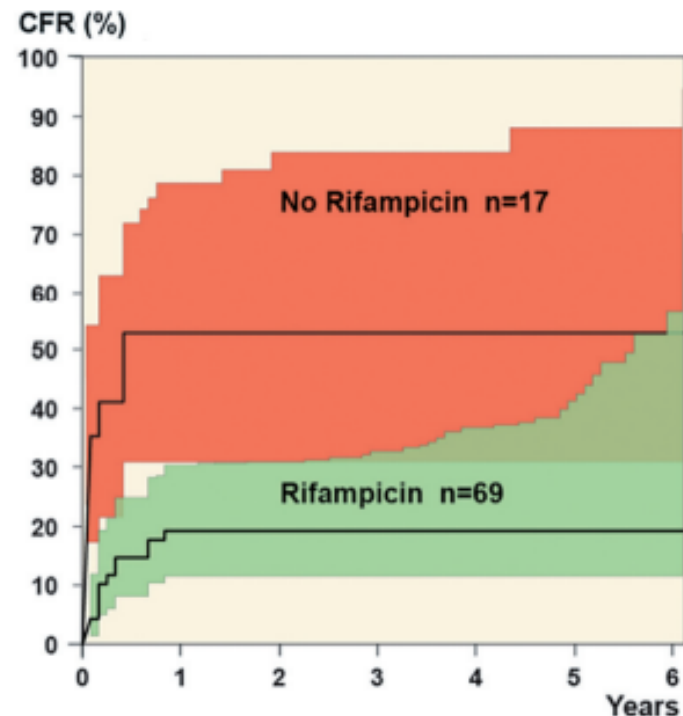
Report on 145 cases from the Swedish Knee Arthroplasty Register

Anna HOLMBERG¹, Valdis Gudrún THÓRHALLSDÓTTIR², Otto ROBERTSSON³, Annette W-DAHL³, and Anna STEFÁNSDÓTTIR³

Acta orthop 2015

145 patients

RR = 4, 95% CI: 2–10



Supériorité clinique

Eur J Clin Microbiol Infect Dis (2010) 29:961–967
DOI 10.1007/s10096-010-0952-9

ARTICLE

Efficacy and safety of rifampin containing regimen for staphylococcal prosthetic joint infections treated with debridement and retention

O. C. El Helou • E. F. Berbari • B. D. Lahr • J. E. Eckel-Passow •
R. R. Razonable • I. G. Sia • A. Virk • R. C. Walker • J. M. Steckelberg •
W. R. Wilson • A. D. Hanssen • D. R. Osmon

J Appl Biomater Funct Mater 2014; 12 (3): 129–134
DOI: 10.5301/jabfm.5000209

ORIGINAL ARTICLE

Risk factors for failure in early prosthetic joint infection treated with debridement. Influence of etiology and antibiotic treatment

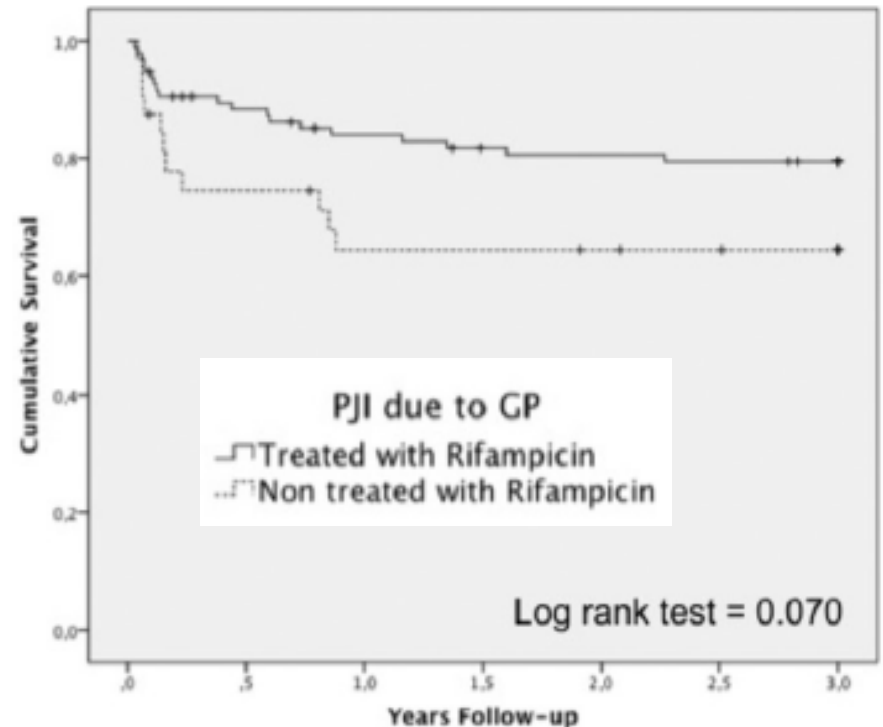
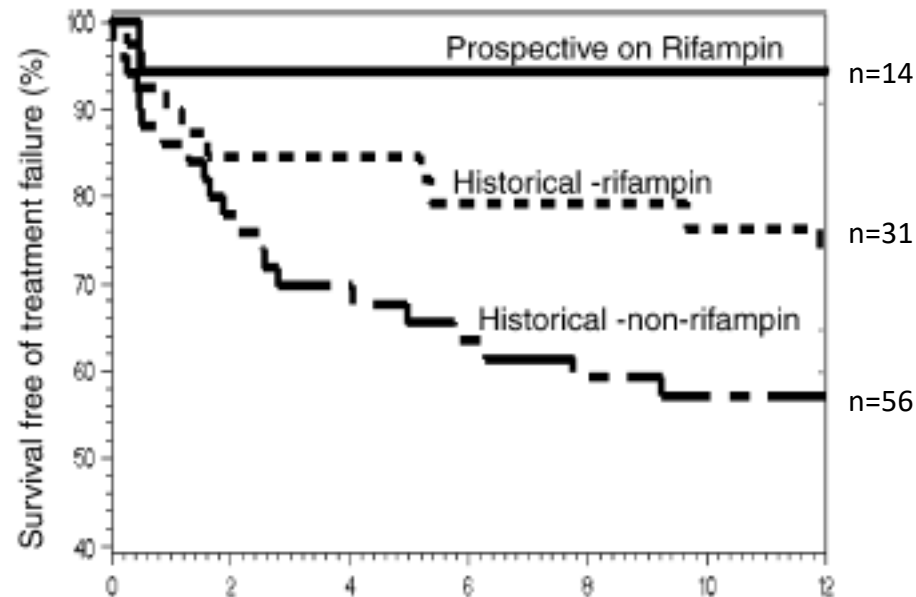
Eduard Tornero¹, Juan C. Martínez-Pastor¹, Guillem Bori¹, Sebastián García-Ramiro¹, Laura Morata²,
Jordi Bosch³, Josep Mensa², Alex Soriano²

¹ Department of Orthopedic and Trauma Surgery, Hospital Clínic of Barcelona, Barcelona - Spain

² Department of Infectious Diseases, Hospital Clínic of Barcelona, IDIBAPS, Barcelona - Spain

³ Laboratory of Microbiology, Hospital Clínic of Barcelona, Barcelona - Spain

n=160



Supériorité clinique

A Large Multicenter Study of Methicillin-Susceptible and Methicillin-Resistant *Staphylococcus aureus* Prosthetic Joint Infections Managed With Implant Retention

Jaime Lora-Tamayo,¹ Oscar Murillo,¹ José Antonio Ibarren,⁵ Alex Soriano,² Mar Sánchez-Somolinos,⁷ Josu Miren Baraia-Etxaburu,¹¹ Alicia Rico,⁸ Julián Palomino,¹² Dolores Rodríguez-Pardo,³ Juan Pablo Horcajada,⁴ Natividad Benito,⁵ Alberto Bahamonde,¹⁴ Ana Granados,¹⁵ María Dolores del Toro,¹³ Javier Cobo,¹¹ Melchor Riera,¹⁶ Antonio Ramos,¹⁰ Alfredo Jover-Sáenz,¹⁷ and Javier Ariza,¹ on behalf of the REPI Group for the Study of Prosthetic Infection

345 MSSA / MRSA (23%) PJI – DAIR

CID 2013

	All Post-Surgical Episodes (n = 244; Failures = 81)				MSSA Post-Surgical Episodes (n = 185; Failures = 60)				MRSA Post-Surgical Episodes (n = 59; Failures = 21)			
	Unadjusted HR (95% CI)	P	Adjusted HR (95% CI)	P	Unadjusted HR (95% CI)	P	Adjusted HR (95% CI)	P	Unadjusted HR (95% CI)	P	Adjusted HR (95% CI)	P
Sex (male)	.73 (.46–1.17)	NS	–	–	.75 (.43–1.28)	NS	–	–	.72 (.28–1.87)	NS	–	–
Age (years)	1.00 (.98–1.02)	NS	–	–	.99 (.97–1.02)	NS	–	–	1.00 (.96–1.04)	NS	–	–
Diabetes mellitus	1.35 (.80–2.26)	NS	–	–	1.24 (.66–2.34)	NS	–	–	1.51 (.61–3.75)	NS	–	–
Chronic renal impairment	2.87 (1.24–6.63)	.032	–	–	3.24 (.78–13.5)	NS	–	–	2.08 (.70–6.18)	NS	–	–
Rheumatoid arthritis	1.60 (.80–3.19)	NS	–	–	1.70 (.81–3.59)	NS	–	–	1.70 (.23–12.8)	NS	–	–
Immunosuppressive therapy	2.46 (1.13–5.36)	.045	–	–	3.30 (1.41–7.74)	.018	3.40 (1.39–8.37)	.008	1.05 (.14–7.83)	NS	–	–
Revision prosthesis	1.66 (1.01–2.74)	.056	–	–	1.97 (1.08–3.61)	.038	–	–	1.09 (.44–2.69)	NS	–	–
Hip prosthesis	1.08 (.69–1.68)	NS	–	–	.93 (.55–1.59)	NS	–	–	1.26 (.51–3.12)	NS	–	–
Time to infection >90 days ^b	2.19 (1.18–4.05)	.013	–	–	1.84 (.98–3.45)	.089	2.18 (1.04–4.56)	.039	7.48 (2.01–27.8)	.013	–	–
Infection by MRSA	1.32 (.80–2.18)	NS	–	–	–	–	–	–	–	–	–	–
Bacteremia	1.70 (.77–3.73)	NS	–	–	2.21 (.99–4.95)	.078	2.35 (1.04–5.36)	.040	–	–	–	–
Polymicrobial infection	1.47 (.88–2.47)	NS	–	–	1.19 (.64–2.21)	NS	–	–	2.81 (1.07–7.39)	.052	–	–
CRP diagnosis (100 mg/L)	1.28 (1.02–1.60)	.047	1.32 (1.05–1.66)	.018	1.22 (.94–1.59)	NS	–	–	1.95 (1.02–3.75)	.052	–	–
Temperature >37°C	1.30 (.83–2.04)	NS	–	–	1.23 (.73–2.08)	NS	–	–	1.89 (.75–4.75)	NS	–	–
Sinus tract	1.62 (.93–2.82)	.086	–	–	1.49 (.77–2.89)	NS	–	–	2.15 (.78–5.92)	NS	–	–
Abnormal radiography	2.24 (1.31–3.85)	.007	2.22 (1.30–3.81)	.004	1.77 (.92–3.42)	NS	–	–	3.60 (1.37–9.45)	.019	4.49 (1.68–12.0)	.003
Debridement delay >10 days ^c	1.57 (1.01–2.45)	.049	1.68 (1.07–2.64)	.024	1.85 (.91–3.77)	.089	–	–	1.50 (.63–3.58)	NS	–	–
Polyethylene exchange ^d	.57 (.34–.97)	.045	–	–	.70 (.36–1.37)	NS	–	–	.46 (.19–1.13)	.096	–	–
Need ≥2 debridements	3.15 (1.88–5.28)	<.001	3.82 (2.24–6.51)	<.001	4.34 (2.39–7.89)	<.001	5.36 (2.88–9.98)	<.001	1.62 (.54–4.81)	NS	–	–
Rifampin*	.55 (.34–.87)	.011	.52 (.32–.83)	.006	.67 (.39–1.17)	NS	–	–	.27 (.11–.65)	.007	–	–
Levofloxacin + Rifampin*	.48 (.27–.88)	.010	–	–	.50 (.27–.92)	.019	.42 (.22–.80)	.008	–	NS	–	–
Vancomycin + Rifampin*	.45 (.17–1.24)	.081	–	–	–	–	–	–	.34 (.11–1.01)	.032	.29 (.10–.87)	.027

Supériorité clinique

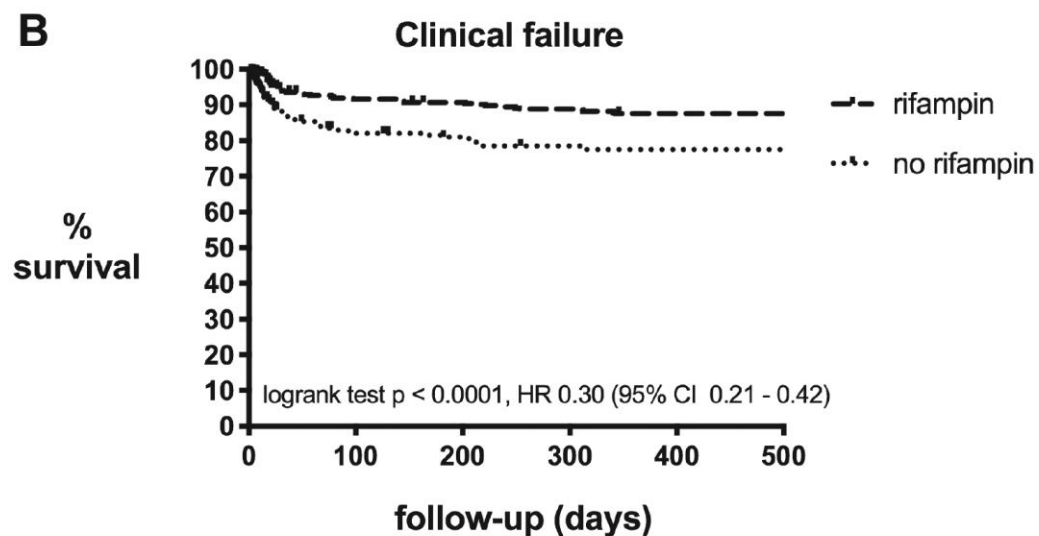
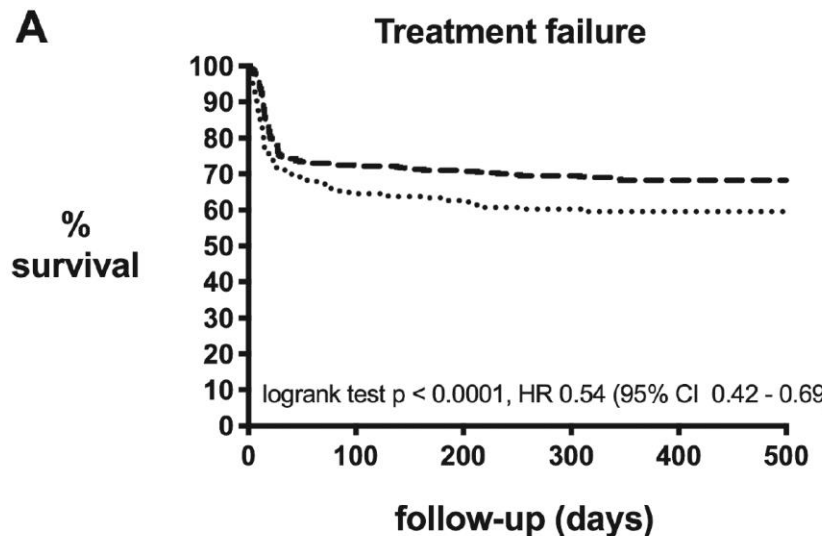
Clinical Infectious Diseases

MAJOR ARTICLE



If, When, and How to Use Rifampin in Acute Staphylococcal Periprosthetic Joint Infections, a Multicentre Observational Study

Mark Beldman,¹ Claudia Löwik,¹ Alex Soriano,² Laila Albiach,² Wierd P. Zijlstra,³ Bas A. S. Knobben,⁴ Paul Jutte,¹ Ricardo Sousa,⁵ André Carvalho,⁵ Karan Goswami,⁶ Javad Parvizi,⁶ Katherine A. Belden,⁷ and Marjan Wouthuyzen-Bakker⁸



Subjects at risk

Rifampin	407	293	288	280	280	280
No rifampin	262	170	162	157	157	157

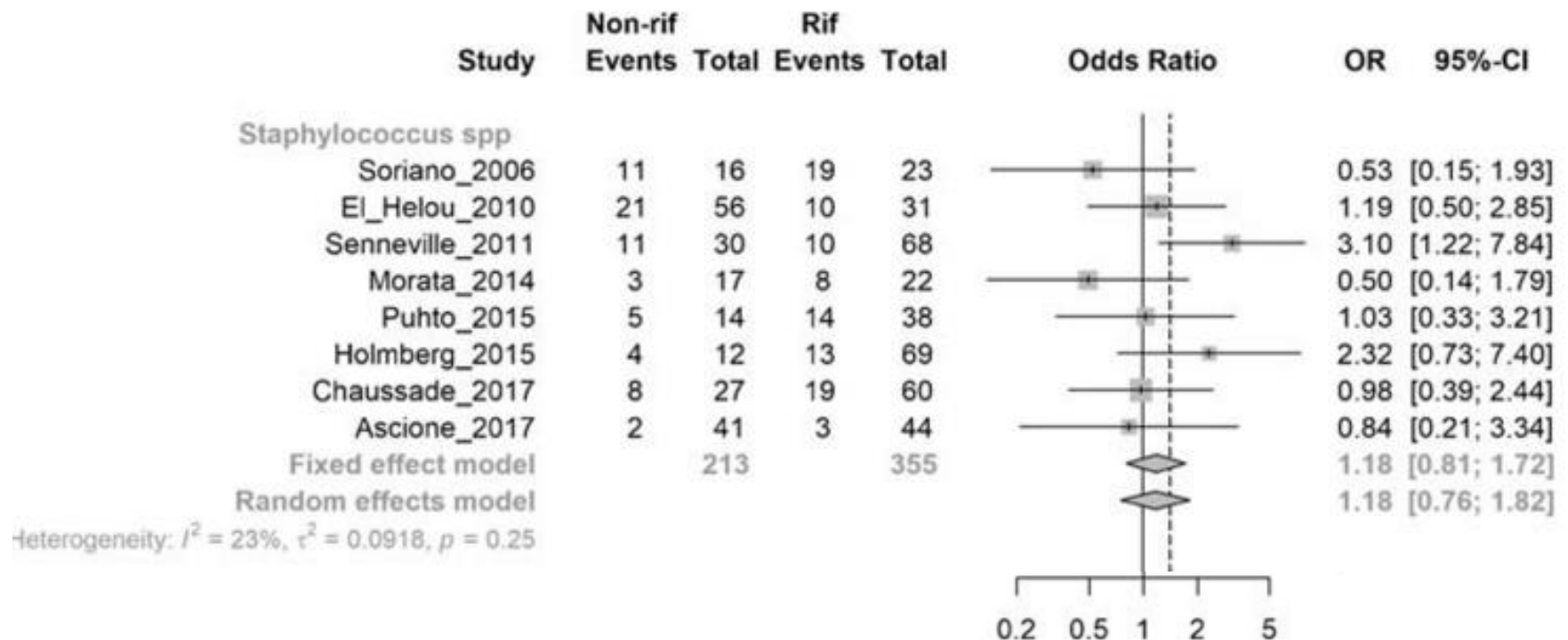
Subjects at risk

Rifampin	407	374	366	360	360	360
No rifampin	262	215	210	204	204	204

Supériorité clinique ?

Rifampin-accompanied antibiotic regimens in the treatment of prosthetic joint infections: a frequentist and Bayesian meta-analysis of current evidence

Ozlem Aydin¹ • Pinar Ergen¹ • Burak Ozturan² • Korhan Ozkan² • Ferhat Arslan¹ • Haluk Vahaboglu¹ 



Quelle dose ?

SPILF 2008	20 mg/kg/j
IDSA 2013	300-450 mg x 2/j
HAS 2014	300 mg x 2/j 900 mg x 1/j
SEIMC 2017	600 mg x 1/j



Meilleurs prédicteurs d'efficacité : modèle [C]dpdt → Théorie : C_{max} / C_{MI} ... mais

- AUC / C_{MI} +++
- Auto-induction et saturation du métabolisme hépatique :
relation C_{max} / dose non linéaire au-delà de 450 mg
- Effet post-antibiotique marqué (y compris intra-biofilm)

Quelle dose ?

Eur J Clin Microbiol Infect Dis (2015) 34:1675–1682
DOI 10.1007/s10096-015-2404-z

ARTICLE

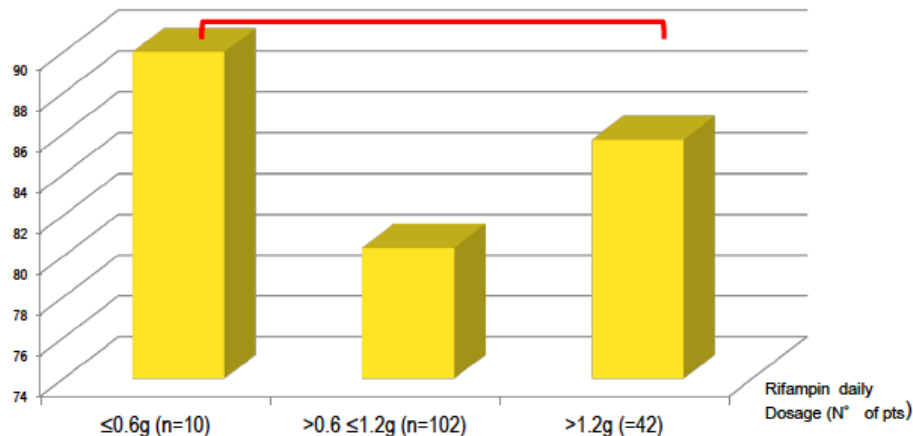
Influence of daily dosage and frequency of administration of rifampicin–levofloxacin therapy on tolerance and effectiveness in 154 patients treated for prosthetic joint infections

S. Nguyen¹ · O. Robineau¹ · M. Titecat² · N. Blondiaux¹ · M. Valette¹ · C. Loiez² · E. Beltrand³ · H. Migaud⁴ · E. Senneville^{1,5}

Daily dosing	Intolerance episodes	p-Value	Discontinuation	p-Value
Rifampicin daily dosage . mg:	n=48 (31.2)		n=29 (18.8)	
≤600 (n=10)	1 (10)	0.04	1 (10)	0.65
>600 to ≤1,200 (n=102)	28 (27.5)		18 (17.6)	
>1,200 (n=42)	19 (45.2)		10 (23.8)	
frequency:				
Once-daily (n=11)	3 (27.3)	0.90	3 (27.3)	0.45
Twice-daily (n=143)	45 (31.4)		26 (18.2)	

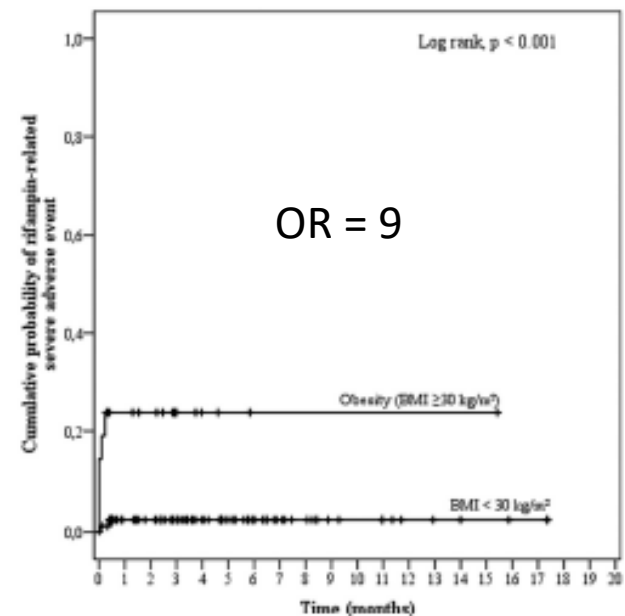
Rémission (%)

P=0.61



Antimicrobial-Related Severe Adverse Events during Treatment of Bone and Joint Infection Due to Methicillin-Susceptible *Staphylococcus aureus*

Florent Valour,^{a,b} Judith Karsenty,^a Anissa Bouaziz,^a Florence Ader,^{a,b} Michel Tod,^c Sébastien Lustig,^d Frédéric Laurent,^{b,a,f} René Ecochard,^g Christian Chidiac,^{a,b} Tristan Ferry,^{a,b} on behalf of the Lyon BJI Study Group



Quelle dose ?

Eur J Clin Microbiol Infect Dis (2015) 34:1675–1682
DOI 10.1007/s10096-015-2404-z

ARTICLE

Influence of daily dosage and frequency of administration of rifampicin–levofloxacin therapy on tolerance and effectiveness in 154 patients treated for prosthetic joint infections

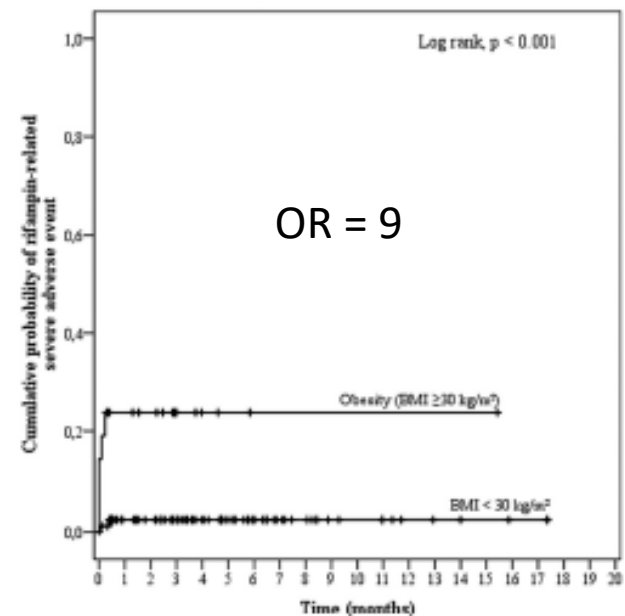
S. Nguyen¹ · O. Robineau¹ · M. Titecat² · N. Blondiaux¹ · M. Valette¹ · C. Loiez² · E. Beltrand³ · H. Migaud⁴ · E. Senneville^{1,5}

Daily dosing	Intolerance episodes	p-Value	Discontinuation	p-Value
Rifampicin daily dosage . mg:	n=48 (31.2)		n=29 (18.8)	
≤600 (n=10)	1 (10)	0.04	1 (10)	0.65
>600 to ≤1,200 (n=102)	28 (27.5)		18 (17.6)	
>1,200 (n=42)	19 (45.2)		10 (23.8)	
frequency:				
Once-daily (n=11)	3 (27.3)	0.90	3 (27.3)	0.45
Twice-daily (n=143)	45 (31.4)		26 (18.2)	



Antimicrobial-Related Severe Adverse Events during Treatment of Bone and Joint Infection Due to Methicillin-Susceptible *Staphylococcus aureus*

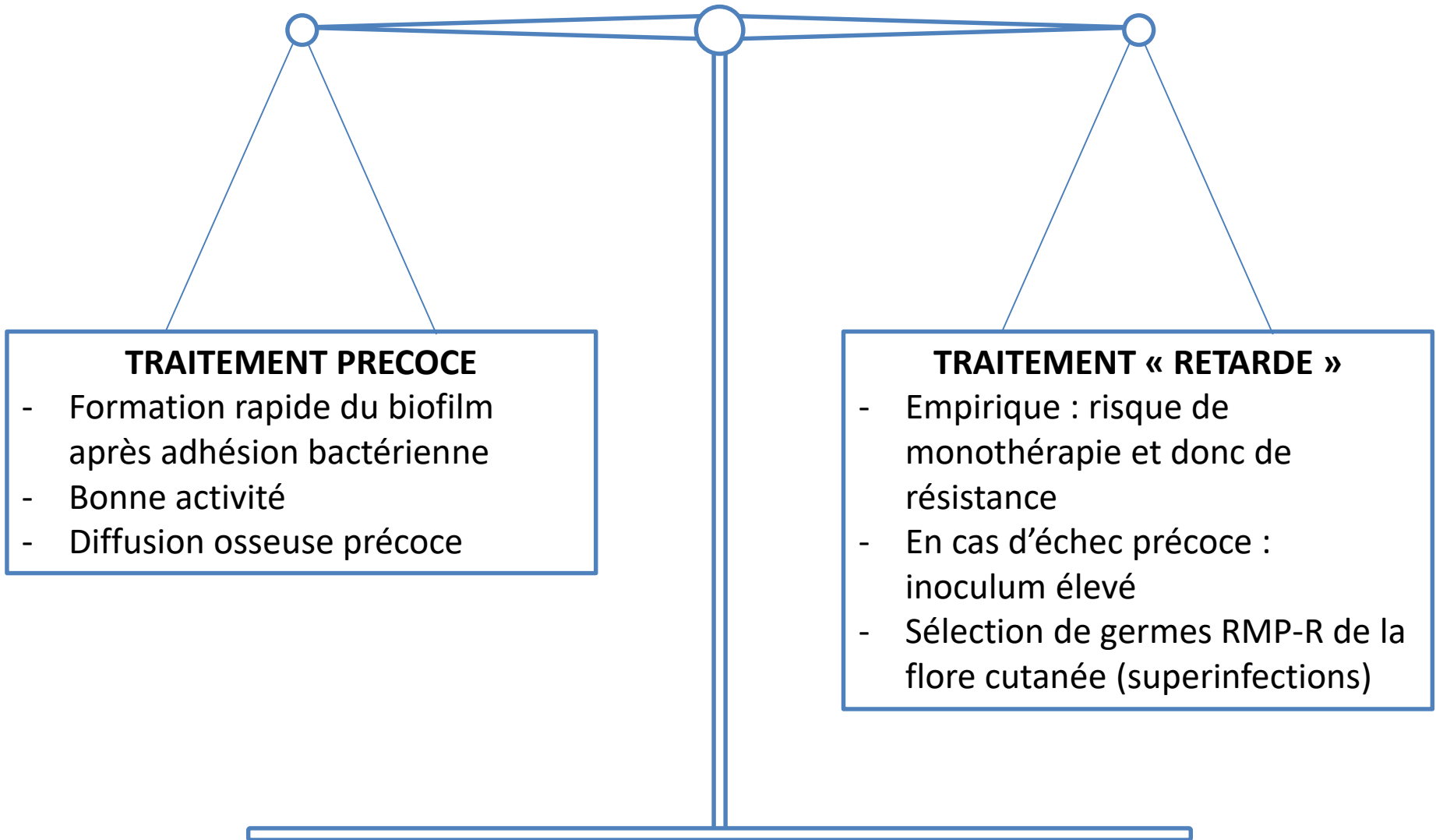
Florent Valour,^{a,b} Judith Karsenty,^a Anissa Bouaziz,^a Florence Ader,^{a,b} Michel Tod,^c Sébastien Lustig,^d Frédéric Laurent,^{b,e,f} René Ecochard,^g Christian Chidiac,^{a,b} Tristan Ferry,^{a,b} on behalf of the Lyon BJI Study Group



EN PRATIQUE

- 600 mg en 1 ou 2 fois par jour si < 70 kg
- 900 mg en 1 ou 2 fois par jour si > 70 kg ?

Quel timing ? Quelle durée ?



Quel timing ? Quelle durée ?

Infection (2013) 41:431–437
DOI 10.1007/s15010-012-0325-7

CLINICAL AND EPIDEMIOLOGICAL STUDY

Factors associated with rifampin resistance in staphylococcal periprosthetic joint infections (PJI): a matched case–control study

Y. Achermann · K. Eigenmann · B. Ledergerber ·
L. Derksen · P. Rafeiner · M. Clauss · R. Nüesch ·
C. Zellweger · M. Vogt · W. Zimmerli

48 PJI SCN (38) ou *S. aureus* (10)

Résistance à la rifampicine

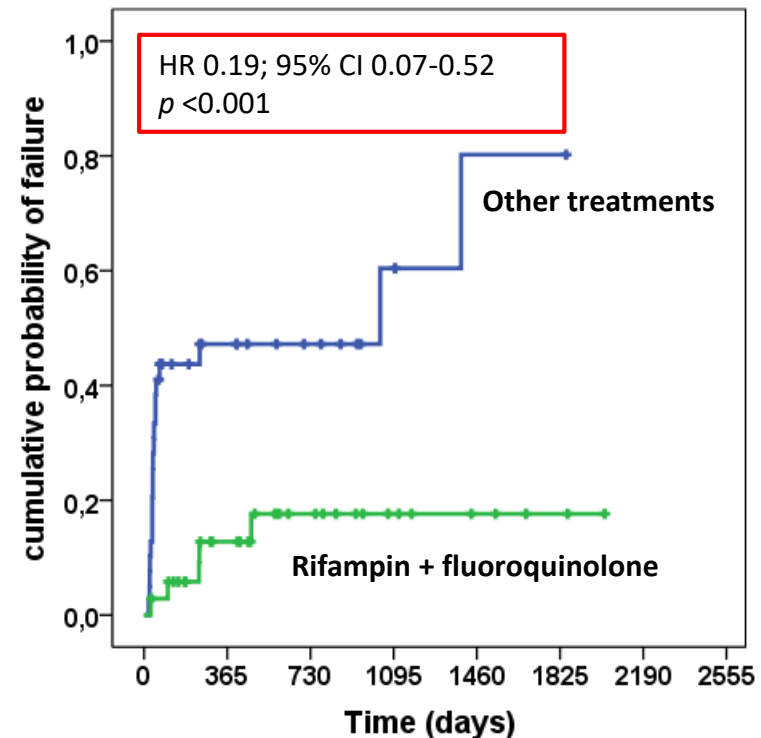
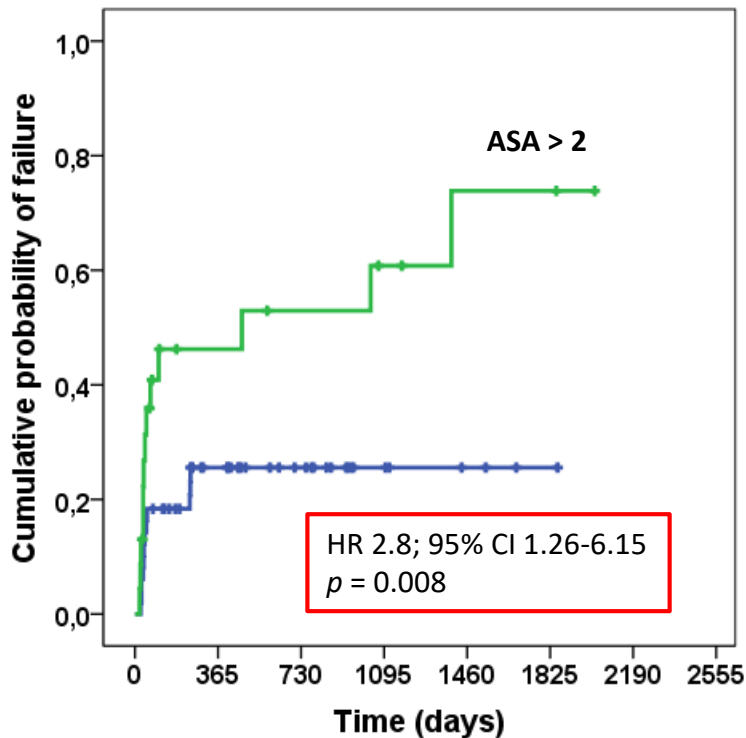
- Sexe masculin (OR 3.6)
- ≥ 3 révisions (OR 4.7)
- Fort inoculum (OR 4.9)
 - Chirurgie non optimale
 - < 2 sem de bithérapie IV
- Utilisation inadéquate de la rifampicine (OR 5.4)
 - Monothérapie
 - Utilisation empirique en association avec un ATB à spectre étroit
 - Utilisation avec un ATB per os à faible biodisponibilité
 - Faible dose

Quel timing ? Quelle durée ?

Duration of rifampin therapy is a key determinant of improved outcomes in early-onset acute prosthetic joint infection due to *Staphylococcus* treated with a debridement, antibiotics and implant retention (DAIR): a retrospective multicenter study in France

A. Becker^{1,2,3}, L. Kreitmann^{3,4}, C. Triffaut-Fillit^{1,2}, F. Valour^{1,2,4,5}, E. Mabrut², E. Forestier⁶, O. Lesens⁷, C. Cazorla⁸, S. Descamps⁹, B. Boyer¹⁰, C. Chidiac^{1,2,4}, S. Lustig^{2,4,11}, E. Montbarbon¹², C. Batailler^{2,4,11}, T. Ferry^{1,2,4,5} on behalf of the IPASTAPH study group

Cohorte rétrospective, multicentrique – 79 PJI traitées par DAIR – 21,6% d'échec
74% sous RMP, 44% sous RMP+FQ

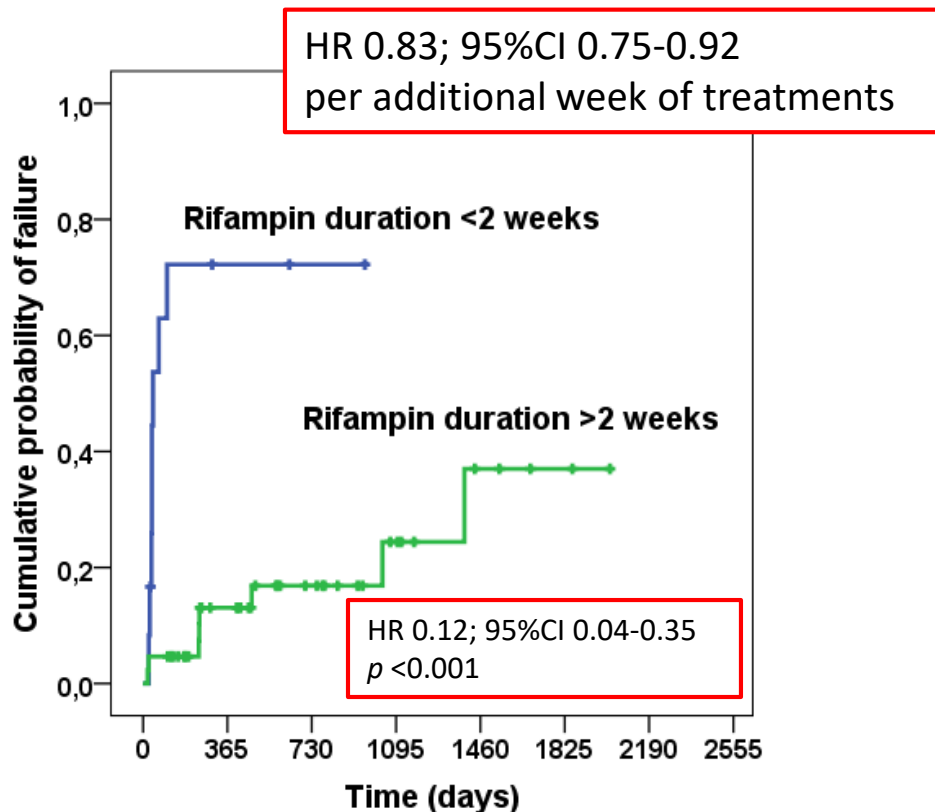
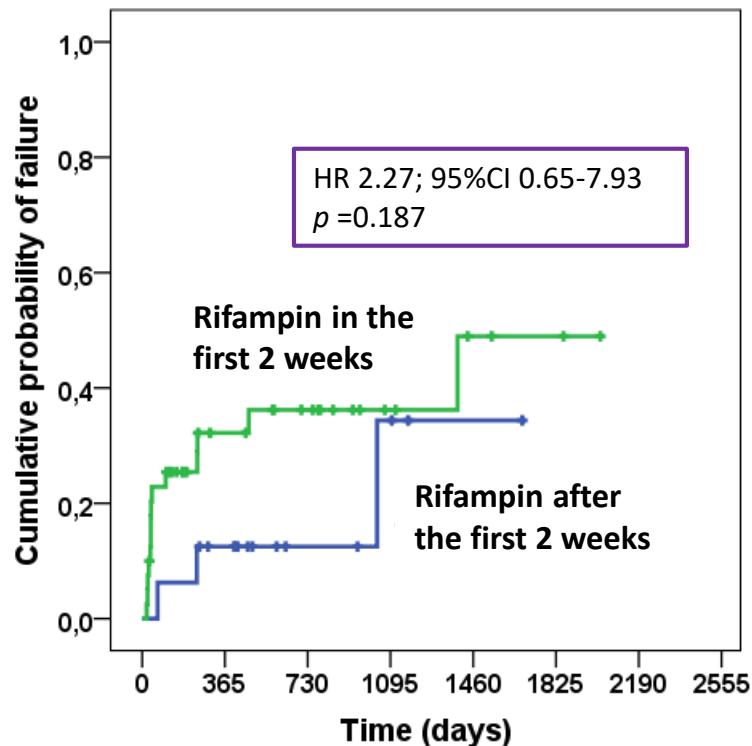


Quel timing ? Quelle durée ?

Duration of rifampin therapy is a key determinant of improved outcomes in early-onset acute prosthetic joint infection due to *Staphylococcus* treated with a debridement, antibiotics and implant retention (DAIR): a retrospective multicenter study in France

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Cohorte rétrospective,
multicentrique – 79 PJI
traitées par DAIR – 21,6%
d'échec
74% sous RMP, 44% sous
RMP+FQ



Quel timing ? Quelle durée ?

Clinical Infectious Diseases

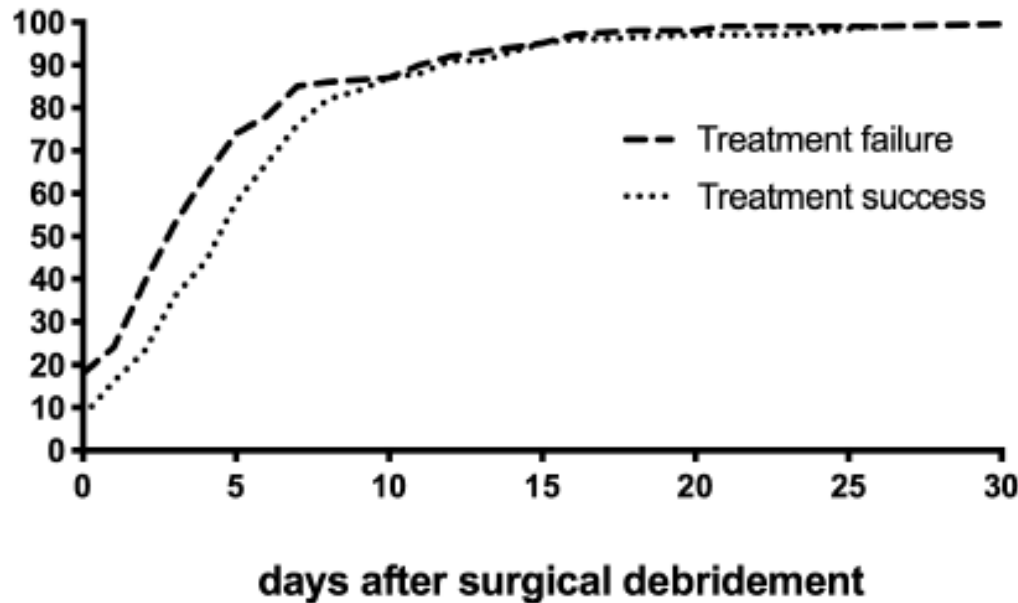
MAJOR ARTICLE



If, When, and How to Use Rifampin in Acute Staphylococcal Periprosthetic Joint Infections, a Multicentre Observational Study

Mark Beldman,¹ Claudia Löwik,¹ Alex Soriano,² Laila Albiach,² Wierd P. Zijlstra,³ Bas A. S. Knobben,⁴ Paul Jutte,¹ Ricardo Sousa,⁵ André Carvalho,⁵ Karan Goswami,⁶ Javad Parvizi,⁶ Katherine A. Belden,⁷ and Marjan Wouthuyzen-Bakker⁸

Start of rifampin



start of rifampin within 5 days
after surgical debridement

OR 1.96, 95% CI 1.08 - 3.65

Quel timing ? Quelle durée ?

European Journal of Clinical Microbiology & Infectious Diseases
https://doi.org/10.1007/s10096-018-3330-7

ORIGINAL ARTICLE



Should we expand the indications for the DAIR (debridement, antibiotic therapy, and implant retention) procedure for *Staphylococcus aureus* prosthetic joint infections? A multicenter retrospective study

O. Lesens^{1,2} • T. Ferry³ • E. Forestier⁴ • E. Botelho-Nevers⁵ • P. Pavese⁶ • E. Piet⁷ • B. Pereira⁸ • E. Montbarbon⁹ • B. Boyer¹⁰ • S. Lustig³ • S. Descamps^{11,12} • on behalf of the Auvergne-Rhône-Alpes Bone and Joint Infections Study Group

137 SA PJI (SARM 20%) traitées par DAIR

RMP : 65%

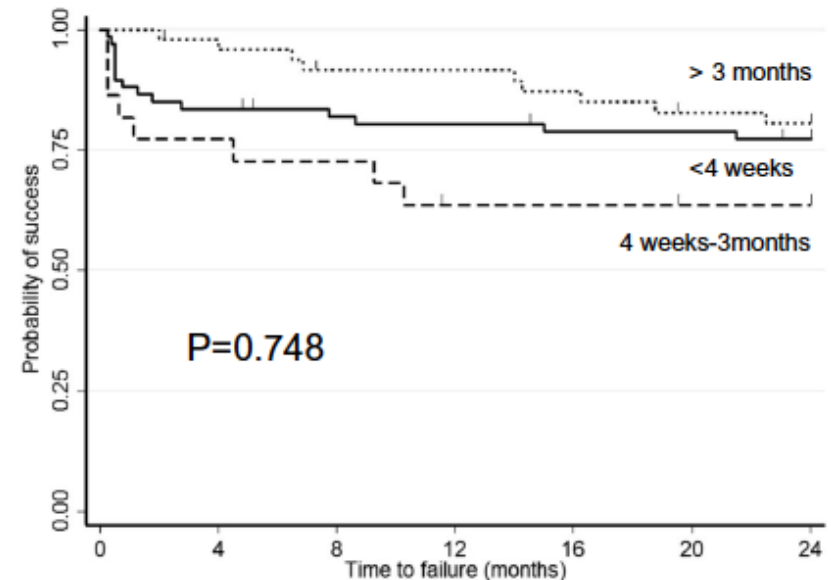
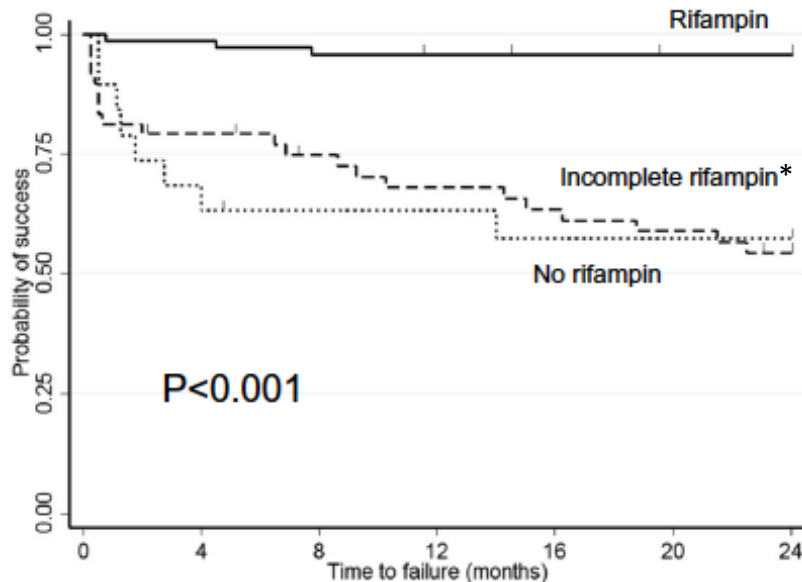
Succès à 2 ans : 76%

	Onset of infection < 3 months <i>n</i> = 89		All patients <i>n</i> = 137	
Variables	HR [95% CI]	<i>p</i>	HR [95% CI]	<i>p</i>
Incomplete rifampin regimen*	0.5 [0.16–1.6]	0.248	0.5 [0.2–1.28]	0.151
Complete rifampin regimen	0.16 [0.03–0.82]	0.028	0.08 [0.018–0.36]	0.001
Treatment duration	0.76 [0.66–0.89]	0.001	0.78 [0.69–0.88]	< 0.001
Active smoking	3.29 [0.8–13.41]	0.097	3.6 [1.09–11.84]	0.036
Early acute	0.25 [0.09–0.7]	0.009	–	–

Courbe ROC :

durée optimale RMP de 10.5 sem

* < 3 sem



Quel timing ? Quelle durée ?

TRAITEMENT PRECOCE

- Formation rapide du biofilm après adhésion bactérienne
- Bonne activité
- Diffusion osseuse précoce

EN PRATIQUE : introduction retardée (J3-J5)

- 1^{ères} données microbiologiques
- Évolution initiale favorable
- Cicatrice propre, drains retirés
- Pas de 2nd look prévu a priori

TRAITEMENT « RETARDE »

- Empirique : risque de monothérapie et donc de résistance
- En cas d'échec précoce : inoculum élevé
- Sélection de germes RMP-R de la flore cutanée (superinfections)

Quel compagnon ?

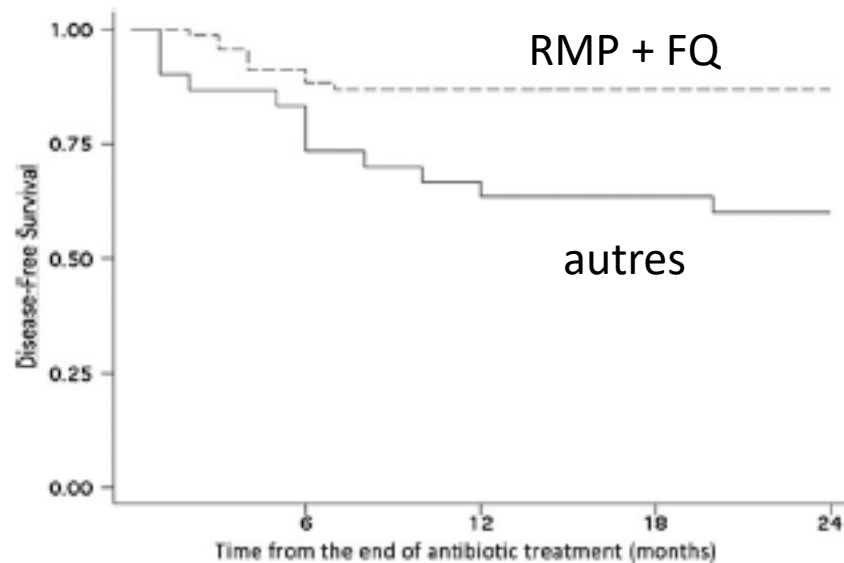
FLUOROQUINOLONES

Outcome and Predictors of Treatment Failure in Total Hip/Knee Prosthetic Joint Infections Due to *Staphylococcus aureus*

Eric Senneville, Donatienne Joulie, Laurence Legout, Michel Valette, Hervé Dezèque, Eric Beltrand, Bernadette Roselé, Thibaud d'Escrivan, Caroline Loiez, Michèle Caillaux, Yazdan Yazdanpanah, Carlos Maynou, and Henri Migaud

CID 2011

98 patients



International Orthopaedics (SICOT) (2015) 39:1785-1791
DOI 10.1007/s00264-015-2819-2

ORIGINAL PAPER

Predictors of treatment outcome in prosthetic joint infections treated with prosthesis retention

Ari-Pekka Puhto¹ · Teija Puhto² · Tuukka Niinimäki¹ · Pasi Ohtonen³ · Juhana Leppilähti¹ · Hannu Syrjälä²

113 PJI aiguës - 66 SA et SCN

- RMP + ciprofloxacine (n=23)
- RMP + autres que FQ (n=29) : HR 6
- Pas de RMP (n=14) : HR 14.4

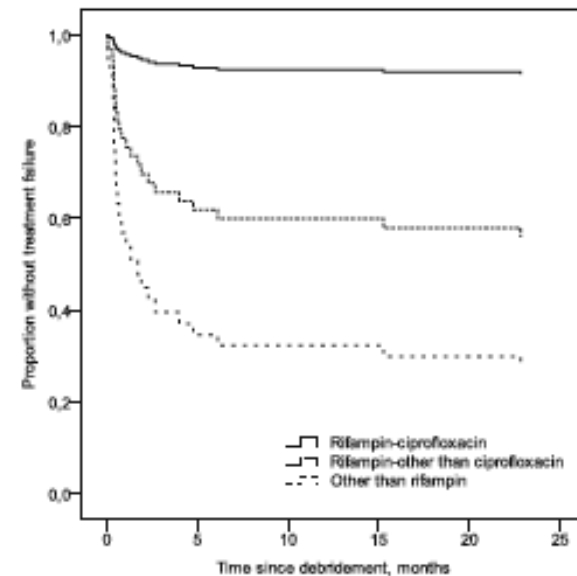


Fig. 3 Survival curves for staphylococcal prosthetic joint infections (PJIs) based on antibiotic treatment group

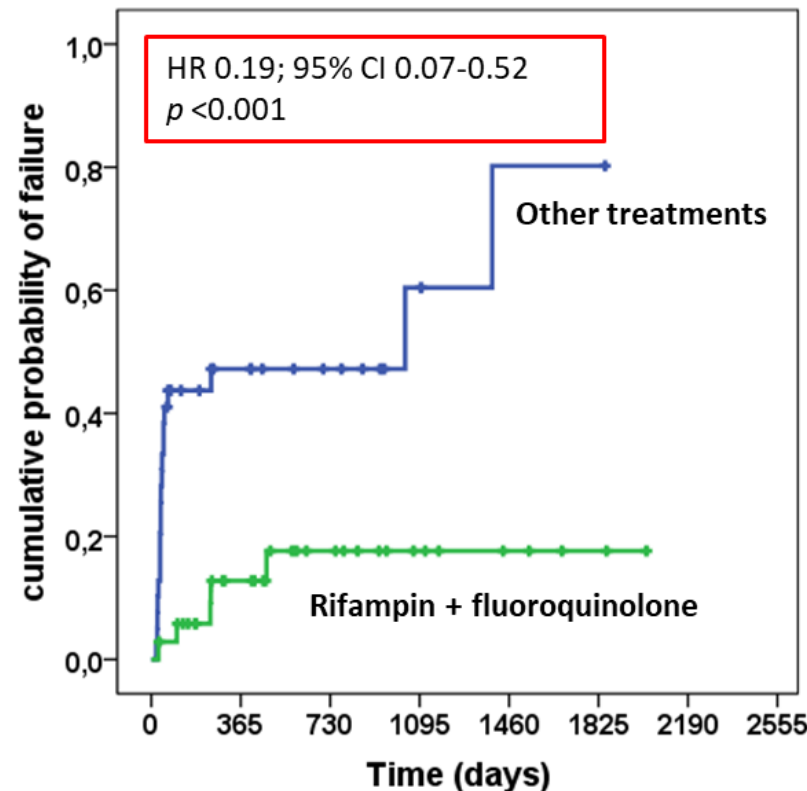
Quel compagnon ?

FLUOROQUINOLONES

Cohorte rétrospective multicentrique
79 PJI *S. aureus* DAIR

Duration of rifampin therapy is a key determinant of improved outcomes in early-onset acute prosthetic joint infection due to *Staphylococcus* treated with a debridement, antibiotics and implant retention (DAIR): a retrospective multicenter study in France

A. Becker^{1,2,3}, L. Kreitmann^{3,4}, C. Triffaut-Fillit^{1,2}, F. Valour^{1,2,4,5}, E. Mabrut², E. Forestier⁶, O. Lesens⁷, C. Cazorla⁸, S. Descamps⁹, B. Boyer¹⁰, C. Chidiac^{1,2,4}, S. Lustig^{2,4,11}, E. Montbarbon¹², C. Batailler^{2,4,11}, T. Ferry^{1,2,4,5} on behalf of the IPASTAPH study group



Quel compagnon ?

FLUOROQUINOLONES

ANTIMICROBIAL AGENTS AND CHEMOTHERAPY, June 1993, p. 1214-1218
0066-4804/93/061214-05\$02.00/0
Copyright © 1993, American Society for Microbiology

Vol. 37, No. 6

Oral Rifampin plus Ofloxacin for Treatment of *Staphylococcus*-Infected Orthopedic Implants

MICHEL DRANCOURT,¹ ANDREAS STEIN,¹ JEAN NOEL ARGENSON,² ARNOLD ZANNIER,¹
GEORGES CURVALE,³ AND DIDIER RAOULT^{1*}

Moxifloxacin plus rifampin as an alternative for levofloxacin plus rifampin in the treatment of a prosthetic joint infection with *Staphylococcus aureus*

Marjan Wouthuyzen-Bakker ^{a,*}, Eduard Tornero ^b, Laura Morata ^c,
Prashant V. Nannan Panday ^d, Paul C. Jutte ^e, Guillem Bori ^f, Greetje A. Kampinga ^g,
Alex Soriano ^c

Molécule	Dose PO (mg)	Pos. /j	C _{max} (mg/l)	BD orale (%)	t _{1/2} (h)	Vd (l/kg)	E. rénale (%)
Norfloxacin	400	2 x	1.6	50%	4-5	1.5	25-40
Pefloxacin	400	2 x	4.6	>90%	10	1.5-2.0	30-60
Ciprofloxacin	500	2 x	1.5	60-80%	3-5	2.5-5.0	30-50
Ofloxacin	400	2 x	3.1	85-95%	5-7	1.2	70-85
Levofloxacin	500	1 x	8.7	>90%	6-8	0.5	85-90
Moxifloxacin	400	1 x	3.6	90%	10	2	20-30

LEVOFLOXACINE

- 1 prise par jour
- CMI plus basses
- Diffusion tissulaire élevée

**RECOMMENDED ORAL COMPANION DRUGS :
CIPROFLOXACINE (AI) or LEVOFLOXACINE (AII)**

Quel compagnon ?

DAPTOMYCINE

Nombreuses études animales

Supériorité daptomycine à forte dose (8-10 mg/kg) + RMP

Saleh-Mghir et al, AAC 2011 – Garrigos et al, AAC 2010

El Haj et al, IJAA 2015 – Stewart et al, AAC 2009

High doses of daptomycin (10 mg/kg/d) plus rifampin for the treatment of staphylococcal prosthetic joint infection managed with implant retention: a comparative study



Jaime Lora-Tamayo ^{a,*}, Jorge Parra-Ruiz ^b, Dolors Rodríguez-Pardo ^c, José Barberán ^d, Alba Ribera ^a, Eduardo Tornero ^e, Carles Pigrau ^c, José Mensa ^f, Javier Ariza ^a, Alex Soriano ^f

Cas-témoins historique

18 PJI aiguës post-opératoires à SA FQ-R traitées par DAIR et dapto (10 mg/kg/j) – RMP

44 contrôles : PJI à SA FQ-R traitées par RMP + autre

- Outcome clinique et microbiologique similaire
- Echec clinique sous traitement inférieur dans le groupe DPT-RMP (22 vs 73%)

Quel compagnon ?

LINEZOLIDE

J Antimicrob Chemother 2010; 65: 2224–2230
doi:10.1093/jac/dkq281 Advance Access publication 29 July 2010

Journal of
Antimicrobial
Chemotherapy

**Tolerability of prolonged linezolid therapy in bone and joint infection:
protective effect of rifampicin on the occurrence of anaemia?**

Laurence Legout^{1*}, Michel Valette¹, Hervé Dezeque², Sophie Nguyen¹, Xavier Lemaire¹, Caroline Loiez³,
Michèle Caillaux⁴, Eric Beltrand⁵, Luc Dubreuil^{1,4}, Yazdan Yazdanpanah¹, Henri Migaud² and Eric Senneville¹

Infect Dis Ther (2014) 3:235–243
DOI 10.1007/s40121-014-0032-z

ORIGINAL RESEARCH

**A Retrospective Review of the Clinical Experience
of Linezolid with or Without Rifampicin in Prosthetic
Joint Infections Treated with Debridement
and Implant Retention**

Laura Morata · Eric Senneville · Louis Bernard · Sophie Nguyen ·
Rodolphe Buzelé · Jérôme Druon · Eduard Tornero · Josep Mensa ·
Alex Soriano

**Decreased serum linezolid concentrations in two
patients receiving linezolid and rifampicin due to
bone infections**

Irma Hoyo, Juan Martínez-Pastor, Sebastian Garcia-Ramiro, Consuelo
Climent, Mercé Brunet, Marta Cuesta, Josep Mensa & Alex Soriano

94 patients, LNZ > 4 sem
RMP protecteur / anémie : 9% vs 44%
Pas de différence d'outcome

Characteristics	Receiving rifampicin (<i>n</i> = 22)	Not receiving rifampicin (<i>n</i> = 17)	<i>P</i>
Outcome (%)			
Remission	14 (64)	14 (82)	0.28
Relapse	6 (27)	2 (12)	
New infection	2 (9)	1 (6)	

Quel compagnon ?

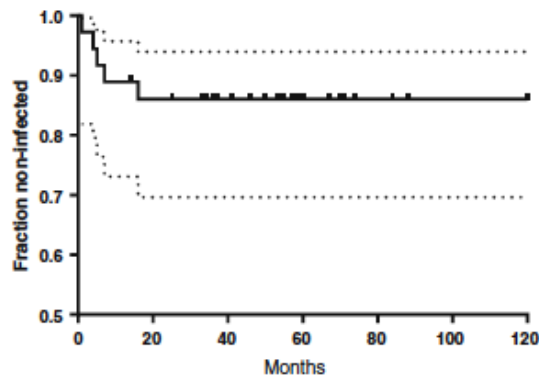
CLINDAMYCINE

	Clinda	Clinda + RMP	<i>p</i> -value	Association outcome	Ref
Cmin (mg/L)	1.52	0.46	0.034	non évalué, cure 92%	Zeller et al, AAC 2010
Cmin (mg/L)	4.7 +/- 1.2	0.79 +/- 0.3	0.001	NON	Curis et al, Infect 2015
Cmax (mg/L)	10.2 +/- 1.8	3.48 +/- 1.1	0.001	NON	Bernard et al, J Infect 2015

Clindamycin-rifampin combination therapy for staphylococcal periprosthetic joint infections: a retrospective observational study

Borg Leijtens^{1*}, Joris B. W. Elbers¹, Patrick D. Sturm², Bart Jan Kullberg³ and Berend W. Schreurs¹

BMC Infect dis 2017



36 patients
86% cure rate
14% effets IIR

Eur J Clin Microbiol Infect Dis (2017) 36:2513–2518
DOI 10.1007/s10096-017-3094-5



ORIGINAL ARTICLE

Efficacy and safety of clindamycin-based treatment for bone and joint infections: a cohort study

J. Courjon^{1,2}, E. Demonchy¹, E. Cua¹, E. Bernard¹, P.-M. Roger^{1,2}

196 BJI, 80 ODI

Antibiotic regimen	Success (%)	Failure (%)	<i>p</i> -value	AOR
Clindamycin + fluoroquinolones	81.6% 44 (40)	2 (9)	0.012	5.35 [1.16–24.55]
Clindamycin + rifampicin	81.4% 22 (25)	5 (23)	0.804	
Clindamycin + others ^b	71.4% 15 (13)	6 (27)	0.138	
Clindamycin + amoxicillin	72.7% 8 (7)	3 (14)	0.562	
Clindamycin alone	71.4% 15 (13)	6 (27)	0.105	

Quel compagnon ?

CLINDAMYCINE

Clinical Infectious Diseases

MAJOR ARTICLE



If, When, and How to Use Rifampin in Acute Staphylococcal Periprosthetic Joint Infections, a Multicentre Observational Study

Mark Beldman,¹ Claudia Löwik,¹ Alex Soriano,² Laila Albiach,² Wierd P. Zijlstra,³ Bas A. S. Knobben,⁴ Paul Jutte,¹ Ricardo Sousa,⁵ André Carvalho,⁵ Karan Goswami,⁶ Javad Parvizi,⁶ Katherine A. Belden,⁷ and Marjan Wouthuyzen-Bakker⁸

Risk factor for failure : Co-antibiotic other than a fluoroquinolone or clindamycin (<.001)
Co-antibiotic with the lowest failure rate : clindamycin (14%)

Quel compagnon ?

ACIDE FUSIDIQUE

Outcome of Debridement and Retention in Prosthetic Joint Infections by Methicillin-Resistant Staphylococci, with Special Reference to Rifampin and Fusidic Acid Combination Therapy

T. N. Peel,^{a,b} K. L. Bulsing,^a M. M. Dowsey,^{b,c} C. A. Aboltins,^a J. R. Daffy,^a P. A. Stanley,^a P. F. M. Choong^{b,c}

AAC 2012

A Randomized Study Evaluating Oral Fusidic Acid (CEM-102) in Combination With Oral Rifampin Compared With Standard-of-Care Antibiotics for Treatment of Prosthetic Joint Infections: A Newly Identified Drug-Drug Interaction

Richard Pushkin,¹ Maria D. Iglesias-Ussel,^{1,2} Kam Keedy,¹ Chris MacLauchlin,¹ Diane R. Mould,² Richard Berkowitz,⁴ Stephan Kreuzer,⁵ Rabi Darouiche,⁶ David Oldach,⁷ and Prabha Fernandes¹

CID 2016

14 patients randomisés, 6 RMP-FUCI

[C] FUCI -45% à S6

3 échecs dans le groupe RMP-FUCI

(1 effet secondaires, 2 persistance infection)



British Journal of Clinical
Pharmacology

Br J Clin Pharmacol (2017) 83 1039–1047 1039

Population pharmacokinetics of rifampicin in adult patients with osteoarticular infections: interaction with fusidic acid

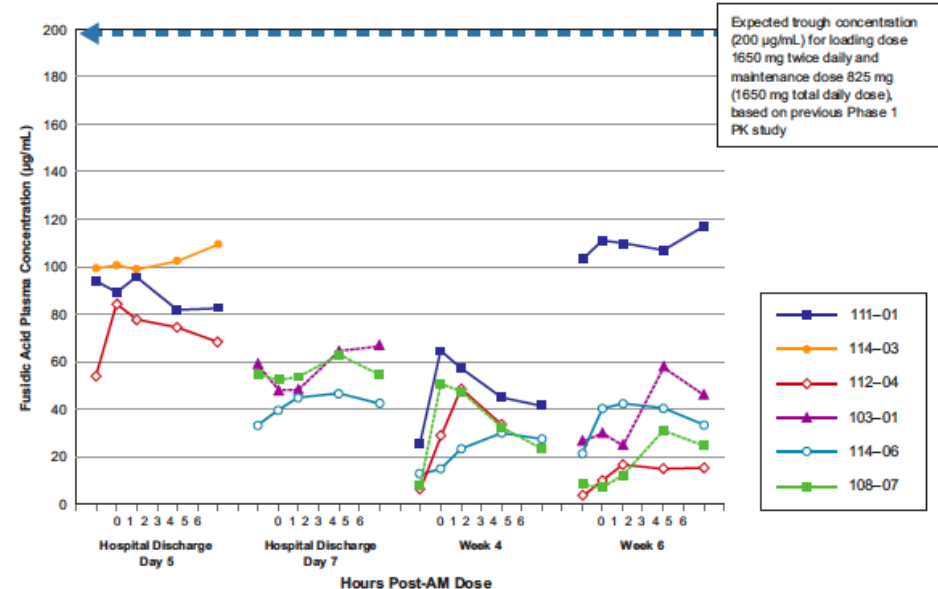
Amélie Marsot^{1,2}, Amélie Ménard³, Julien Dupouey^{1,2}, Cedric Muziotti¹, Romain Guilhaumou^{1,2} and Olivier Blin^{1,2}

43 patients, dont 38 sous RMP - FUCI

9 échecs, dont 8 sous RMP - FUCI

4 échecs avec persistance du MRSA/MRCoNS

3 acquisition de résistance à RMP et FUCI



Elévation des [C] de RMP
parfois supra-toxiques

Quel compagnon ?

- Absence d'antagonisme
- Bonne diffusion tissulaire
- Mode d'action différent
- Faible interaction avec la rifampicine

EN PRATIQUE : RIFAMPICINE + ...

1^e choix :

- CIPROFLOXACINE (A-I) ou LEVOFLOXACINE (A-II)

2^e choix :

- COTRIMOXAZOLE (A-II)
- DOXYCYCLINE (B-III)
- BETA-LACTAMINE anti-staphylococcique (C-III)

Pas d'acide fusidique

Pas de clindamycine ???

Rifampicine et IOA non staphylococciques

IOA streptococciques

Outcome of patients with streptococcal prosthetic joint infections with special reference to rifampicin combinations



E. Raux¹, M. Titecat², O. Robineau³, J. Lora-Tamayo⁴, Y. El Samad⁵, M. Etienne¹, N. Frebourg⁶, N. Blondiaux⁷, B. Brunschweiler⁸, F. Dujardin⁹, E. Bertrand¹⁰, C. Lolez², V. Cattoir¹¹, J.P. Canalelli⁸, C. Hulet¹², M. Valette³, S. Nguyen³, F. Caron¹, H. Migaud¹³, and E. Senneville^{3,14*} on behalf of the G4 bone and joint infection study group (G4BJIS)

Table 3 Outcome of 95 episodes of streptococcal prosthetic joint infections; univariate analysis

Variables	Remission (n = 67)	Failure (n = 28)	p
Age > 70 years	35 (36.8 %)	11 (39.3 %)	.25
≥1 comorbidity	46 (68.7 %)	24 (85.7 %)	.09
Total hip arthroplasty	40 (42.1 %)	10 (35.7 %)	.03
Type of infection (early/delayed/late)	20 (29.8 %)/18 (26.9 %)/29 (43.3 %)	11 (39.3 %)/7 (25 %)/10 (35.7 %)	.19
Fever	35 (36.8 %)	17 (60.7 %)	.45
CRP in mg/L, mean value ± SD	154.6 ± 121.9	207.2 ± 148.3	.09
<i>S. agalactiae</i> (group B streptococci)	27 (28.4 %)	10 (35.7 %)	.68
Antibiotic treatment prior to admission	18 (18.9 %)	8 (28.6 %)	.86
Sinus tract	15 (15.8 %)	3 (10.7 %)	.18
Concomitant bacteremia at the time of diagnosis	11 (16.4 %)	8 (28.6 %)	.18
DAIR	32 (33.7 %)	23 (82.1 %)	.002
Primary arthroplasty	53 (79.1 %)	20 (71.4 %)	.42
Hematogenous origin	10 (14.9 %)	8 (28.6 %)	.12
Rifampicin based combinations	44 (46.3 %)	8 (28.6 %)	.001
Rifampicin + levofloxacin	24 (25.2 %)	4 (14.3 %)	.04

IOA streptococciques

The Not-So-Good Prognosis of Streptococcal Periprosthetic Joint Infection Managed by Implant Retention: The Results of a Large Multicenter Study

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462 PJI

34% *S. agalactiae*

Beta-lactamines +++

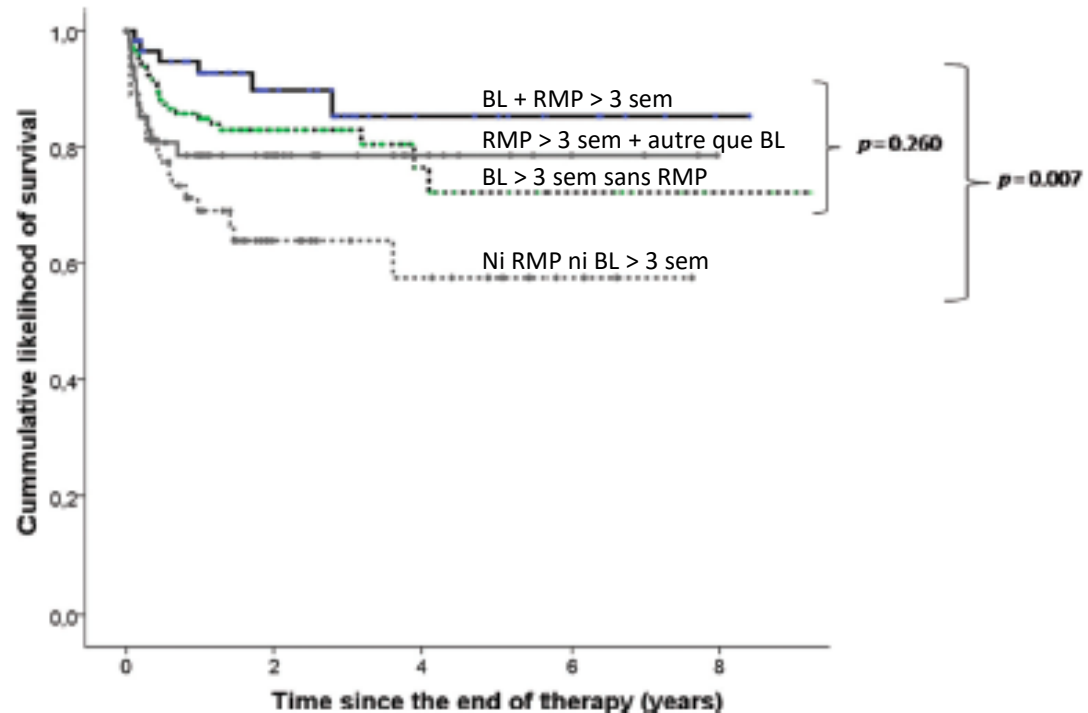
37% rifampicine

Echec (42.1%)

- PR
- Infection post-opératoire tardive
- Bactériémie

Succès

- Changement des pièces mobiles
- Rifampicine (0.98 / jour dans les 30 premiers jours)
- Béta-lactamine > 3 sem en monothérapie (0.48) ou avec RMP (0.34)



IOA streptococci



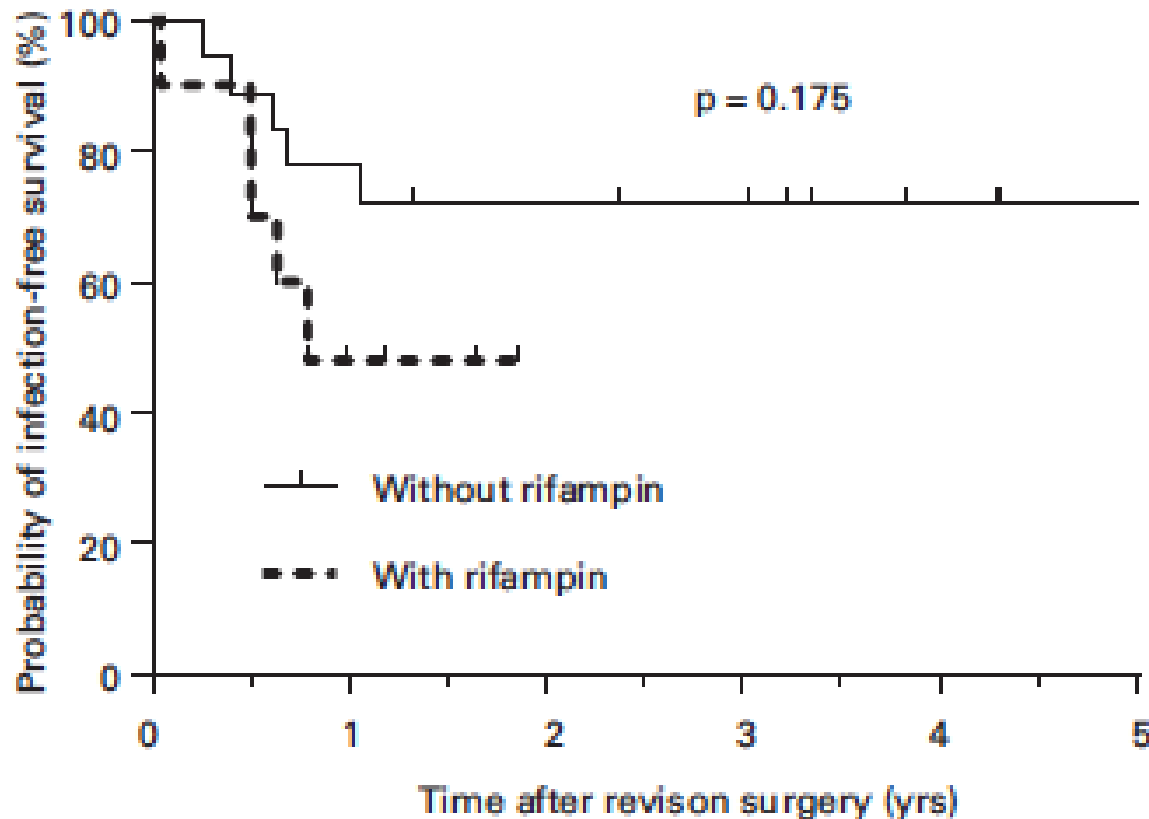
■ ARTHROPLASTY

High failure rates in treatment of streptococcal periprosthetic joint infection

RESULTS FROM A SEVEN-YEAR RETROSPECTIVE COHORT STUDY

D. Akgün,
A. Trampuz,
C. Perka,
N. Renz

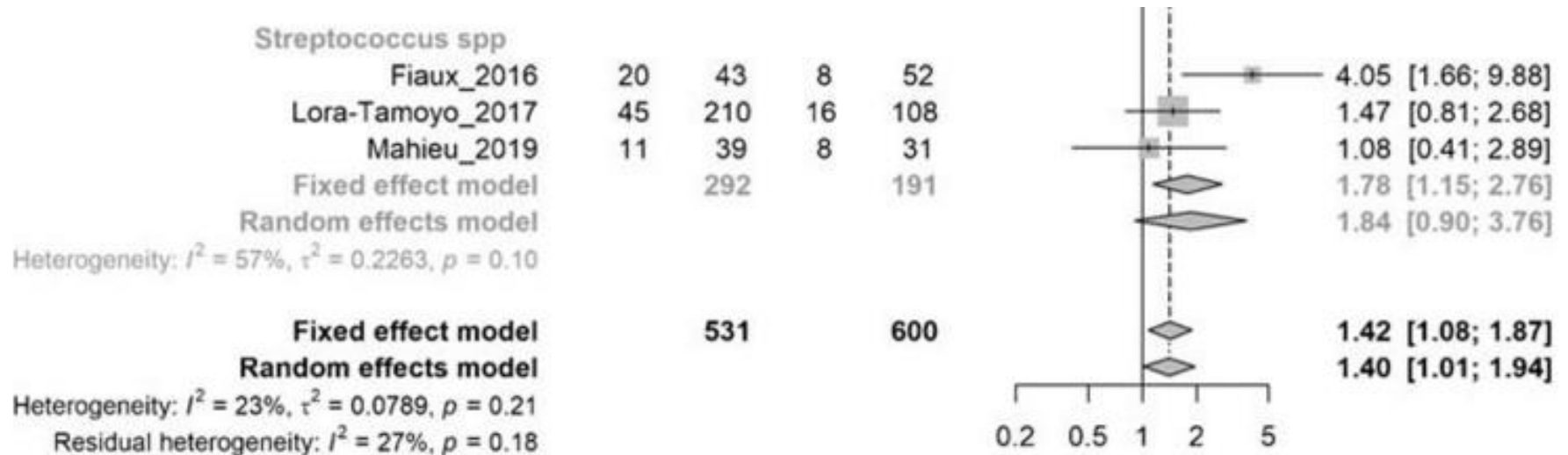
30 patients
40% *S. agalactiae*
10% RMP-based



IOA streptococci

Rifampin-accompanied antibiotic regimens in the treatment of prosthetic joint infections: a frequentist and Bayesian meta-analysis of current evidence

Ozlem Aydın¹ • Pinar Ergen¹ • Burak Ozturan² • Korhan Ozkan² • Ferhat Arslan¹ • Haluk Vahaboglu¹ 



IOA à entérocoque

J Antimicrob Chemother 2012; **67**: 433–439
doi:10.1093/jac/dkr477 Advance Access publication 22 November 2011

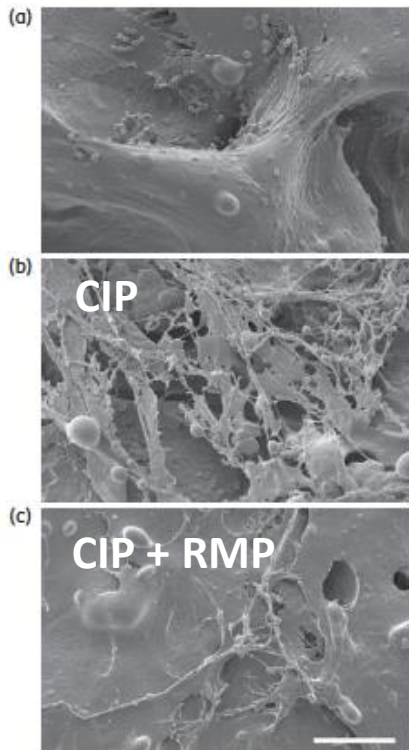
Journal of
Antimicrobial
Chemotherapy

Effectiveness of ciprofloxacin or linezolid in combination with rifampicin against *Enterococcus faecalis* in biofilms

Anna Holmberg*, Matthias Mörgelin and Magnus Rasmussen

Bonne action anti-biofilm

+ LNZ ou CIP



Antibiotic/combination	MIC (mg/L), median (range)	MBEC (mg/L), mode (range)
Ampicillin	0.5 (0.25–2)	256 (128–512)
Ampicillin/rifampicin		↓ 64 (32–256)
Vancomycin	2 (2–4)	256 (256–512)
Vancomycin/rifampicin		↓ 64 (32–256)
Linezolid	1 (0.5–2)	128 (64–256)
Linezolid/rifampicin		↓ 64 (32–64)
Ciprofloxacin	2 (1–>16)	256 (256)
Ciprofloxacin/rifampicin		↓ 32 (16–32)
Rifampicin	1 (0.5–8)	128 (64–128)

IOA à entérocoque

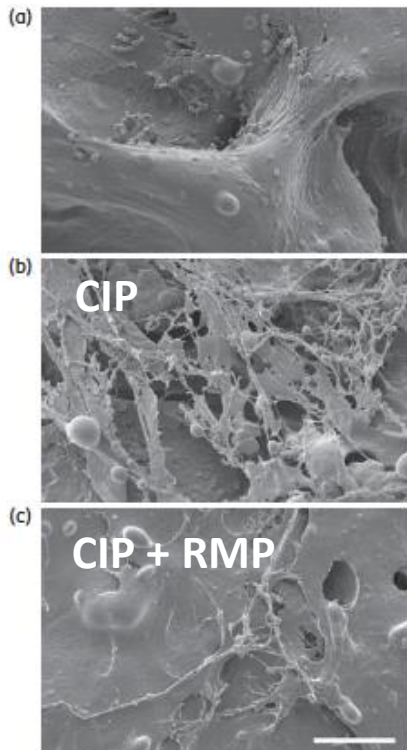
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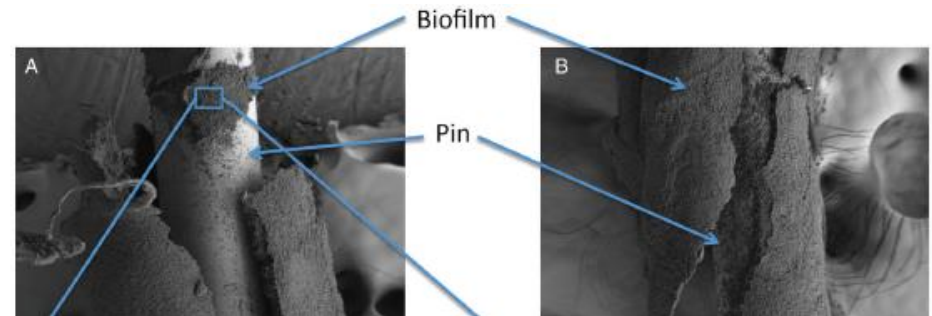
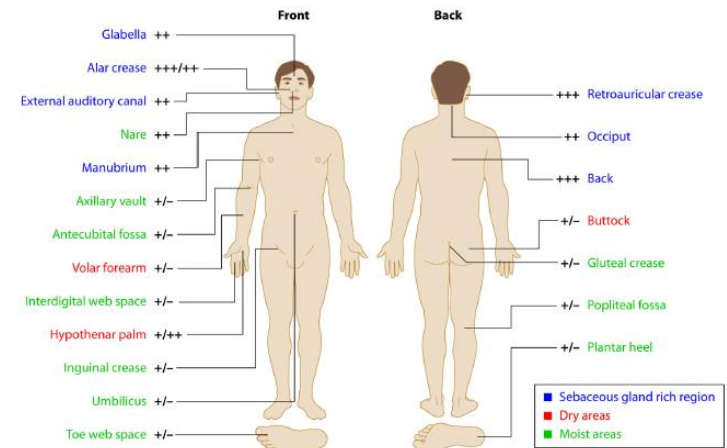
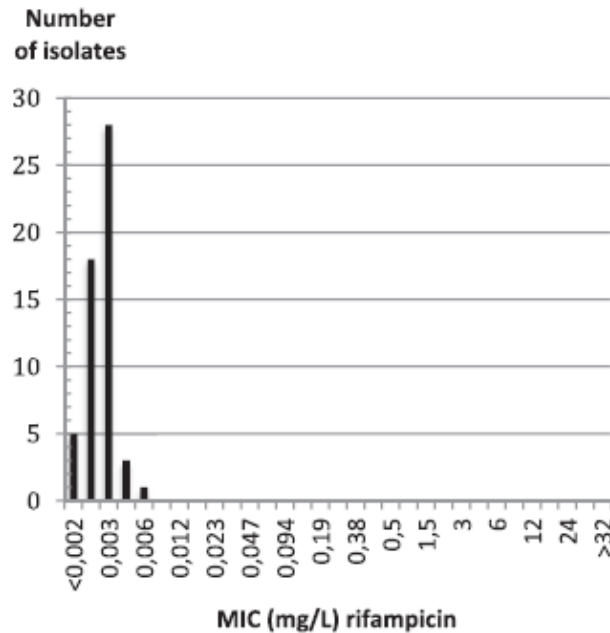
Characteristics of prosthetic joint infections due to *Enterococcus* sp. and predictors of failure: a multi-national study

E. Tornero¹, E. Senneville², G. Euba³, S. Petersdorf⁴, D. Rodriguez-Pardo⁵, B. Lakatos⁶, M. C. Ferrari⁷, M. Pílares⁸, A. Bahamonde⁹, R. Trebse¹⁰, N. Benito¹¹, L. Sorli¹², M. D. del Toro¹³, J. M. Baraiaetxaburu¹⁴, A. Ramos¹⁵, M. Riera¹⁶, A. Jover-Sáenz¹⁷, J. Palomino¹⁸, J. Ariza³ and A. Soriano¹ on behalf of the European Society Group of Infections on Artificial Implants (ESGIAI)

Age of implant at the moment of infection	Type of antibiotic	Remission (%)	Failure (%)	p value
≤30 days	Vancomycin	9 (36)	16 (64)	0.41
	Ampicillin	6 (40)	9 (60)	1
	Rifampin ^{a,b}	12 (60)	8 (40)	0.04
	Aminoglycoside ^a	3 (30)	7 (70)	0.49
	Linezolid	4 (80)	1 (20)	0.15
	Daptomycin	0	1	1
>30 days	Vancomycin	37 (65)	20 (35)	0.60
	Ampicillin	30 (67)	15 (33)	0.49
	Rifampin ^a	35 (58)	25 (42)	0.31
	Aminoglycoside ^a	20 (54)	17 (46)	0.20
	Linezolid	6 (46)	7 (54)	0.22
	Daptomycin	3 (43)	4 (57)	0.42

IOA à *Cutibacterium acnes*

- Cause fréquente de PJI (épaule)
- Sensibilité à la RMP



- Sécrétion d'adhésines, formation de biofilm
- Sensibilité diminuée des souches en biofilm
- MBEC RMP la plus faible *in vitro*

... mais pas de synergie
in vitro (planctonique)

Parameter	Value (μg/ml) ^a						
	Rifampin	Daptomycin	Levofloxacin	Vancomycin	Clindamycin	Penicillin G	Ceftriaxone
MIC	0.007	1	1	1	0.125	0.03	0.25
MBC	4	4	2	8	512	16	32
MBC/MIC ratio	571	4	2	8	4,096	5,333	128
MBEC	16	64	512	512	128	32	64

Antimicrobial combination	Number (%) of isolates			
	Synergism	Additive	Indifference	Antagonism
RI+PG	0	23 (42%)	32 (58%)	0
RI+CM	0	0	55 (100%)	0
RI+MZ	0	13 (24%)	41 (75%)	1 (2%)
RI+FU	0	8 (15%)	44 (80%)	3 (5%)
RI+DC	0	4 (7%)	49 (89%)	2 (4%)
RI+MX	0	10 (18%)	44 (80%)	1 (2%)
RI+LZ	0	7 (13%)	46 (87%)	2 (4%)

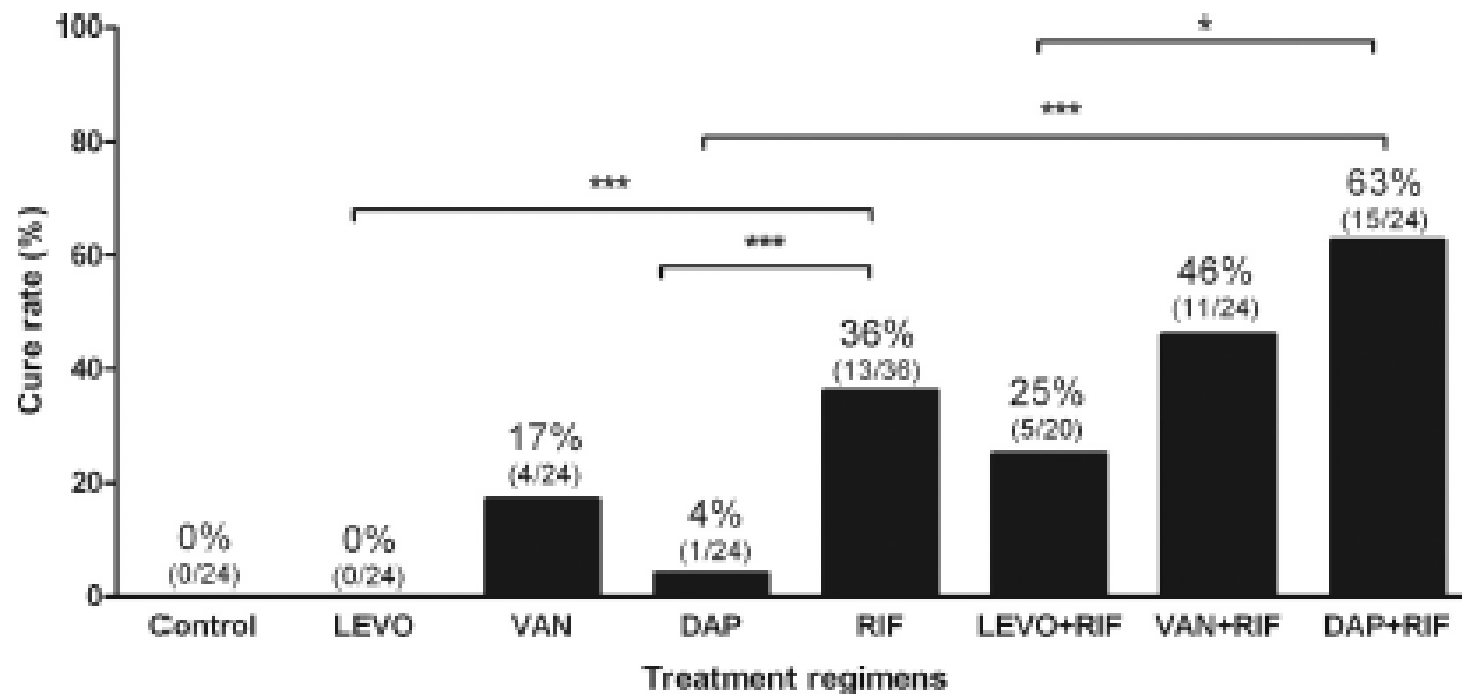
IOA à *Cutibacterium acnes*



2012

Role of Rifampin against *Propionibacterium acnes* Biofilm *In Vitro* and in an Experimental Foreign-Body Infection Model

Ulrika Furustrand Tabin,^a Stéphane Corvec,^{a,b} Bertrand Betrisey,^a Werner Zimmerli,^c and Andrej Trampuz^a



Pas d'évaluation BL + RMP

IOA à *Cutibacterium acnes*

Characteristics and Treatment Outcomes of *Propionibacterium acnes* Prosthetic Shoulder Infections in Adults

Damani A. Piggott,^{1,4} Yvonne M. Higgins,¹ Michael T. Melia,¹ Brandon Blis,⁵ Karen C. Carroll,^{1,2} Edward G. McFarland,³ and Paul G. Auwaerter^{1,5}

OFID 2015

Etude rétrospective
24 PJI épaule
15 sous RMP

Treatment	Total Treated No. (%)	Favorable Outcome ^a No. (%)
Type of treatment*		
Antibiotic therapy only	7 (29) ^b	4 (67)
Antibiotic therapy + surgery	14 (58)	10 (71)
Surgical type*		
1-stage exchange	4 (27) ^c	3 (75)
2-stage exchange	7 (47)	6 (86)
Rifampin therapy*		
Yes	15 (71) ^d	11 (73)
No	5 (24)	3 (60)

P=0.61

mais 40% d'arrêt prématuré de RMP / effets secondaires

IOA à *Cutibacterium acnes*

60

Acta Orthopaedica 2016; 87 (1): 60–66

Treatment of prosthetic joint infections due to *Propionibacterium*

Similar results in 60 patients treated with and without rifampicin

Anouk M E JACOBS ¹, Miranda L VAN HOOFF ², Jacques F MEIS ^{3,4}, Fidel VOS ⁵, and Jon H M GOOSEN ¹

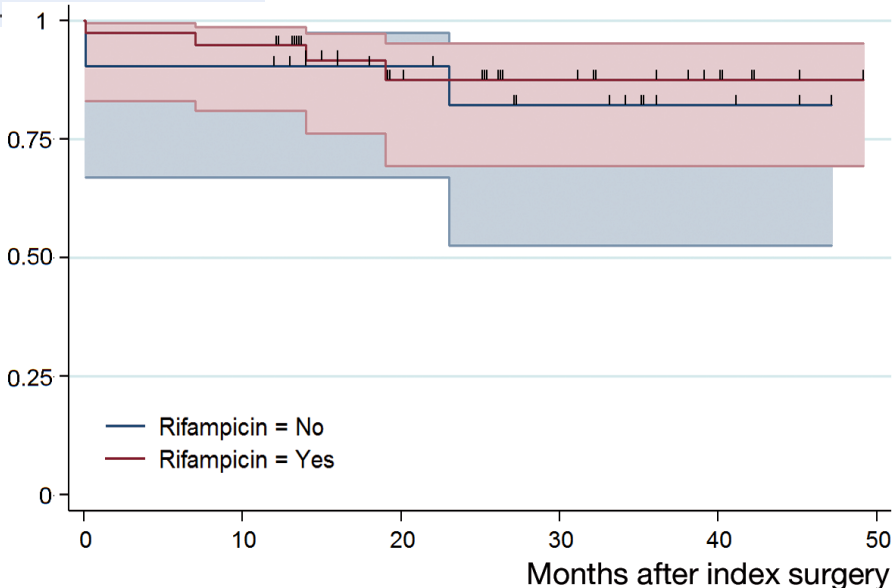
Etude rétrospective

60 patients avec PJI

39 sous RMP + clinda (n=33)
+ téico (n=6)

vs. 21 sans RMP

Characteristic	Rifampicin (n = 39)	No rifampicin (n = 21)	Total group (n = 60)	p-value
Failures				
1-year follow-up	2/39	2/21	4/60	0.7
2-year follow-up	4/23	3/13	7/36	0.6
Survival, median (range), months	19 (0.1–49)	23 (0.2–47)	21 (0.1–49)	0.9
Type of failure				
Relapse ^a	2	2	4	0.4
Reinfection ^b	2	1	3	0.5





Take-home messages

Synthèse



IOA à *S. aureus* / matériel traitées par DAIR ... avec FQ



SENSIBILITE *IN VITRO*



DIFFUSION TISSULAIRE



ACTION « ANTI-BIOFILM » (et intracellulaire)



TOLERANCE



ETUDES CLINIQUES



SCN

POSOLOGIE OPTIMALE

TIMING

IOA sans MATERIEL

Autres Gram +