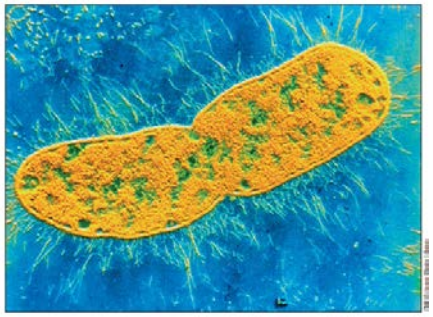
CARBAPÉNÈMES POUR LE TRAITEMENT DES BACTÉRIEMIES A ENTÉROBACTÉRIES BLSE

H. Georges. Réanimation CH Tourcoing

Entérobactéries BLSE +



→ **Les carbapénèmes sont le traitement de référence**

→ Activité des céphamycines

→ Fosfomycine et tigécycline et colimycine plutôt sensibles

→ *Résistance naturelle des pénicillines, C1G, C2G, C3G, monobactames, uréidopénicillines*

→ aminosides : sensible dans 60 à 70% des cas

→ FQ sensibles dans 30% des cas

→ Céfepime sensible dans 30% des cas

→ BL/IBL (sulbactam, tazobactam, clavulanate) sensibles : 20 à 70% des cas

Plusieurs types de bétalactamases

Tableau 1 Bêta-lactamines : comportement habituel en fonction du type de bêta-lactamase.

	PASE	BLSE	CASE	CASE HP	CASE SE
Amoxicilline	R	R	R	R	R
Amoxicilline + AC	S/I/R	S	R	R	R
Ticarcilline	R	R	S	R	R
Ticarcilline + AC	S/I/R	S	S	R	R
Pipéracilline	R	R	S	R	R
Pipéracilline + PTZ	S/I/R	S	S	R	R
Céfalotine	I/R	R	R	R	R
Céfamandole	I/R	R	S	R	R
Céfuroxime	S/I	R	S	R	R
Céfoxitine	S	S	R	R	R
Céfotaxime	S	R	S	R	R
Ceftazidime	S	R	S	R	R
Céfépime	S	R	S	S	R
Cefpirome	S	R	S	S	R
Aztréonam	S	R	S	R	R
Imipénème	S	S	S	S	S
Méropénème	S	S	S	S	S
Ertapénème	S	S	S	S	S

PASE : pénicillinase ; BLSE : bêta-lactamase à spectre élargi/étendu ; CASE : céphalosporinase inductible ; CASE HP : céphalosporinase hyperproduite ou plasmidique ; CASE SE : céphalosporinase à spectre élargi/étendu ; CARB : carbapénèmase ; R : résistant ; S : sensible ; I : intermédiaire ; AC : acide clavulanique ; PTZ : tazobactam.

Alternatives to carbapenems in ESBL-producing *Escherichia coli* infections

Alternatives aux carbapénèmes dans les infections à Escherichia coli producteurs de BLSE

D. Fournier[a], C. Chirouze[b], J. Leroy[b], P. Cholley[c,d], D. Talon[c,d], P. Plésiat[a], X. Bertrand[c,*,d]

2013

Antibiotics	Proportion of isolates with indicated MIC (µg/mL)													
	≤0.03	0.06	0.13	0.25	0.5	1	2	4	8	16	32	64	128	>128
Amoxicillin/clavulanate								8	32	35	19	4	2	
Piperacillin/tazobactam						4	20	31	25	14	6			
Mecillinam				11*	26	26	12	8	7	3	4	0	1	2
Temocillin (systemic)								12	49	31	7	1		
Temocillin (urinary)								12	49	31	7	1		
Cefoxitine						1	16	48	25	5	2	2	1	
Cefotaxime					3*	5	2	4	11	23	13	18	12	9
Ceftazidime				5*	10	12	17	14	15	9	8	4	5	1
Cefepime				5	4	14	16	27	15	10	5	2	2	
Aztreonam					1	10	15	21	19	15	12	2	2	3
Imipenem		6	78	12	2	2								
Ertapenem	85	10	2	2	1									
Tigecycline				16	65	18	1							
Fosfomycin						97*		1		1		1		
Nitrofurantoin							2	19	28	33	8	4	5	1

Cefepime Therapy for Monomicrobial Bacteremia Caused by Cefepime-Susceptible Extended-Spectrum Beta-Lactamase–Producing *Enterobacteriaceae*: MIC Matters

Nan-yao 2013

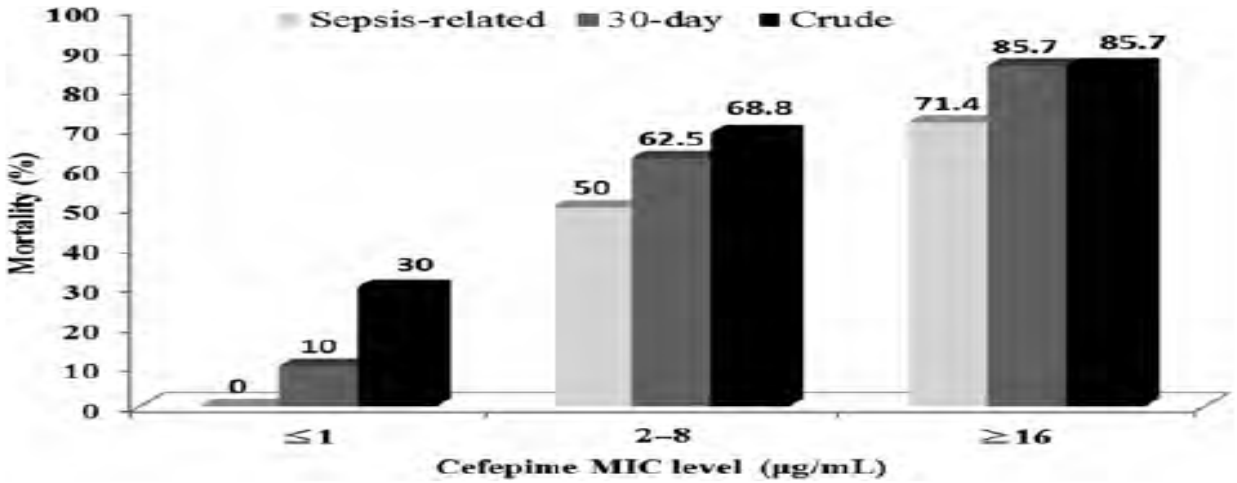
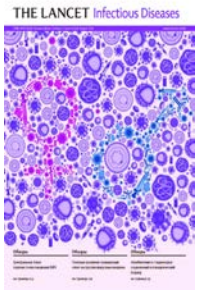


Table 2. Multivariate Logistic Regression Analysis of Associations Between Different Variables and 30-Day Mortality in the Definitive Therapy Cohort

			Univariate Analysis		Multivariate Analysis	
Variable	Survivors (n = 141)	Nonsurvivors (n = 37)	OR (95% CI)	*P* Value	OR (95% CI)	*P* Value
Age, years (mean ± SD)	65.1 ± 17.1	69.7 ± 16.9	…	.15	…	…
Male	78 (55.1)	21 (56.8)	1.06 (.51–2.2)	1.0	…	…
Hospital-onset bacteremia	96 (68.1)	31 (83.8)	2.42 (.94–6.22)	.07	1.46 (.47–4.48)	.51
Urosepsis	38 (27.0)	1 (2.7)	0.08 (.01–.57)	.001	0.18 (.02–1.43)	.1
Pitt bacteremia score ≥4 points	85 (60.3)	34 (91.9)	7.47 (2.19–25.49)	<.001	5.36 (1.37–20.91)	.016
Rapidly fatal underlying disease	9 (6.4)	11 (29.7)	6.21 (2.34–16.47)	<.001	4.42 (1.54–12.64)	.006
Definitive therapy with cefepime	7 (5.0)	10 (27.0)	7.09 (2.48–20.27)	<.001	9.93 (2.77–31.91)	<.001



Extended-spectrum β-lactamase-producing Enterobacteriaceae: an emerging public-health concern

Johann D D Pitout, Kevin B Laupland

2008

	Type of study	Organisms	Infection	Antimicrobial therapy	Conclusions	Limitations
Burgess et al[56]	Retrospective	*E coli*, *Klebsiella* spp	Various	Carbapenems, piperacillin-tazobactam, fluroquinolones	Limited	Small number of patients; multiple assessments per patient; investigators not blinded
Endimiani et al[57]	Retrospective	*K pneumoniae*	Bacteraemia	Imipenem, ciprofloxacin	Good response with imipenem; poor response with ciprofloxacin	Small number of patients; potential for biases
Ho et al[58]	Case-control	*E coli*	Bacteraemia	Different empirical regimens	Higher crude mortality among ESBLs; poor response with ceftazidime	Specific data were not reported on treatment and outcome of patient subgroups
Kim et al[59]	Retrospective	*K pneumoniae*	Bacteraemia	Carbapenems, ciprofloxacin, aminoglycosides	Good outcome with carbapenems; limited numbers for ciprofloxacin and aminoglycosides	Small number of patients
Kim et al[60]	Observational	*E coli*, *K pneumoniae*	Bacteraemia	Empirical regimens with cephalosporins and aminoglycosides	Poor outcome with cephalosporins and aminoglycosides	Small number of patients; investigators not blinded
Kang et al[61]	Observational	*E coli*, *K pneumoniae*	Bacteraemia	Various regimens (empirical and definitive)	Poor outcome with empirical cephalosporins; good outcome with ciprofloxacin and carbapenems	Observational study with conflicting results
Paterson et al[62,63]	Observational, multicentre	*K pneumoniae*	Bacteraemia	Various	Good outcome with carbapenems compared with non-carbapenem regimens	Small number of patients; effect of empirical therapy not reported
Zanetti et al[64]	Randomised controlled trial	Various	Nosocomial pneumonia	Imipenem *vs* cefepime	Superior outcome with imipenem	Small number of patients
Lee et al[65]	Retrospective	*K pneumoniae*	Various	Carbapenems, flomoxef	Flomoxef as effective as carbapenems	Small number of patients
Bin et al[66]	Observational	CTX-M-producing *E coli*	Bacteraemia	Imipenem, ceftazidime, cefoperazone-sulbactam	Outcomes were similar in the three groups	Small number of patients; observational study

Table 3: Clinical studies of antimicrobial therapies and outcomes of infections caused by ESBL-producing bacteria

Antibiotic Therapy for *Klebsiella pneumoniae* Bacteremia: Implications of Production of Extended-Spectrum β-Lactamases

David L. Paterson,[1,2] Wen-Chien Ko,[3] Anne Von Gottberg,[4] Sunita Mohapatra,[5] Jose Maria Casellas,[6] Herman Goossens,[7] Lutfiye Mulazimoglu,[8] Gordon Trenholme,[5] Keith P. Klugman,[4] Robert A. Bonomo,[9] Louis B. Rice,[9] Marilyn M. Wagener,[1] Joseph G. McCormack,[2] and Victor L. Yu[1]

2003

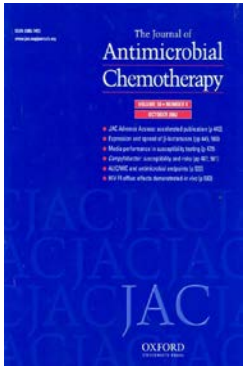
Variable	Carbapenem group (n = 42)	Noncarbapenem group (n = 29)	P	OR (95% CI)
Male sex	28 (66.7)	14/29 (48.3)	.15	2.1 (0.7–6.4)
Underlying disease				
Neutropenia	3 (7.1)	0 (0)	.27	…
Any immunocompromise	24 (57.1)	7/29 (24.1)	.006	4.19 (1.3–14.0)
Renal failure	11 (27.5)[a]	10 (35.7)[b]	.47	0.68 (0.2–2.2)
Any significant underlying disease	33 (78.6)	21 (72.4)	.55	1.39 (0.4–4.8)
Underlying source of infection				
Pneumonia	9 (21.4)	7 (24.1)	.79	0.86 (0.2–3.0)
Intra-abdominal infection	6 (14.3)	10 (34.5)	.08	0.31 (0.1–1.1)
Urinary tract infection	8 (19.0)	2 (6.9)	.18	3.2 (0.1–15.4)
Wound infection	4 (9.5)	1 (3.4)	.64	2.9 (0.3–25.8)
Other source	7 (16.7)	2 (6.9)	.29	2.7 (0.5–13.5)
Severity-of-illness marker				
Admission to ICU	15 (35.7)	13 (44.8)	.47	0.7 (0.2–2.0)
APACHE III score, mean ± SD	71.7 ± 16	59.2 ± 23	.16	1.03 (0.98–1.08)
Previous LOS, median days	11.5	15.0	.16	0.99 (0.98–1.01)

Type of therapy	All-cause 14-day mortality
Carbapenem monotherapy	1/27 (3.7)
Imipenem	1/24
Meropenem	0/3
Quinolone monotherapy (ciprofloxacin)	4/11 (36.3)
Cephalosporin monotherapy	2/5 (40)
Cefepime	1/2
Ceftriaxone	1/2
Cefotaxime	0/1
β-Lactam/β-lactamase inhbitor combination	2/4 (50)
Piperacillin-tazobactam	2/2
Ticarcillin-clavulanate	0/2
Aminoglycoside monotherapy (amikacin)	0/2 (0)
No active antibiotics	7/11 (63.6)

Mortality risk factor, by time after positive blood culture results	*P*	OR (95% CI)
14-Day mortality		
All cause		
Carbapenem treatment	.017	0.09 (0.01–0.65)
Pitt bacteremia score	.073	1.42 (0.97–2.08)
Admission to ICU	.23	3.46 (0.46–26.26)
Attributed to *K. pneumoniae* bacteremia[a]		
Carbapenem treatment	.013	0.04 (0.002–0.50)
Pitt bacteremia score	.095	1.45 (0.94–2.26)
Admission to ICU	.32	2.89 (0.35–23.90)
28-Day mortality		
All cause		
Admission to ICU	.005	6.90 (1.78–26.69)
LOS before bacteremia	.013	0.97 (0.94–0.99)
Carbapenem treatment	.050	0.28 (0.08–1.00)
Attributed to *K. pneumoniae* bacteremia[a]		
Carbapenem treatment	.001	0.06 (0.01–0.33)
LOS before bacteremia	.019	0.97 (0.94–0.99)
Admission to ICU	.085	4.18 (0.82–21.31)

Mortality and delay in effective therapy associated with extended-spectrum β-lactamase production in Enterobacteriaceae bacteraemia: a systematic review and meta-analysis

Mitchell J. Schwaber[1]* and Yehuda Carmeli[1,2]



2007

Reference	First author	BSI episodes			Mortality (%)		Delay in effective therapy (%)	
		ESBL	non-ESBL	total	ESBL	non-ESBL	ESBL	non-ESBL
12	Schwaber	99	99	198	35	18	66	7
17	Tumbarello	48	99	147	52	29	50	2
18	Marra	56	52	108	32	15	42	31
19	Endimiani	9	14	23	33	14	44	14
20	Zaoutis	35	105	138	23	13	—	—
21	Blomberg	16	83	99	63	40	—	—
22	Panhotra	10	16	26	60	6	—	—
23	Kang	60	60	120	30	28	85	5
24	Kim BN	43	115	158	23	20	57	7
25	Du	23	62	85	13	29	26	13
26	Kim YK	45	87	132	27	6	—	—
27	Borer	6	112	118	83	14	—	—
28	Ho	50	100	150	18	7	80	6
29	Menashe	26	29	57	50	38	27	0[a]
30	Pena	49	43	92	33	28	61	26
31	Ariffin	16	15	31	50[b]	13[b]	—	—

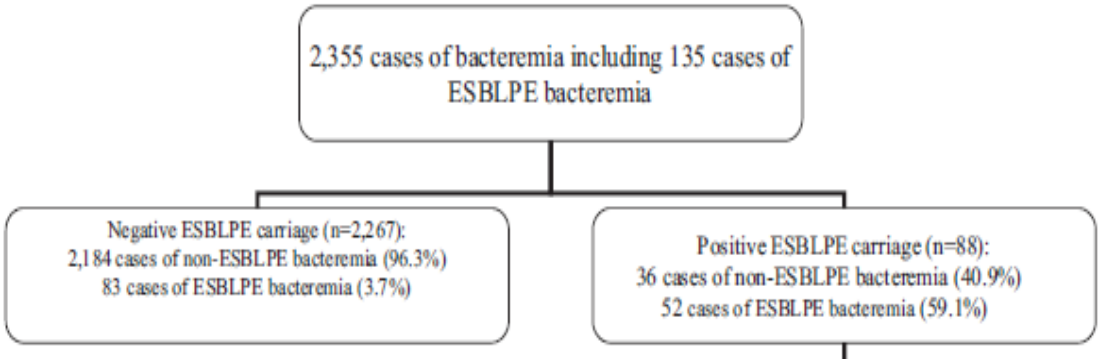
Facteurs de risque

	Community onset	Hospital onset
Risk factors	Repeat UTIs and underlying renal pathology; previous antibiotics including cephalosporins and fluoroquinolones; previous hospitalisation; nursing-home residents; older men and women; diabetes mellitus; underlying liver pathology	Longer length of hospital stay; severity of illness (more severe, the higher the risk); longer time in the intensive-care unit; intubations and mechanical ventilation; urinary or arterial catheterisation; previous exposure to antibiotics (especially cephalosporins)

Enterobacteriaceae bacteremia: Risk factors for ESBLPE

Bactériémie à entérobactérie : facteurs de risque de EBLSE

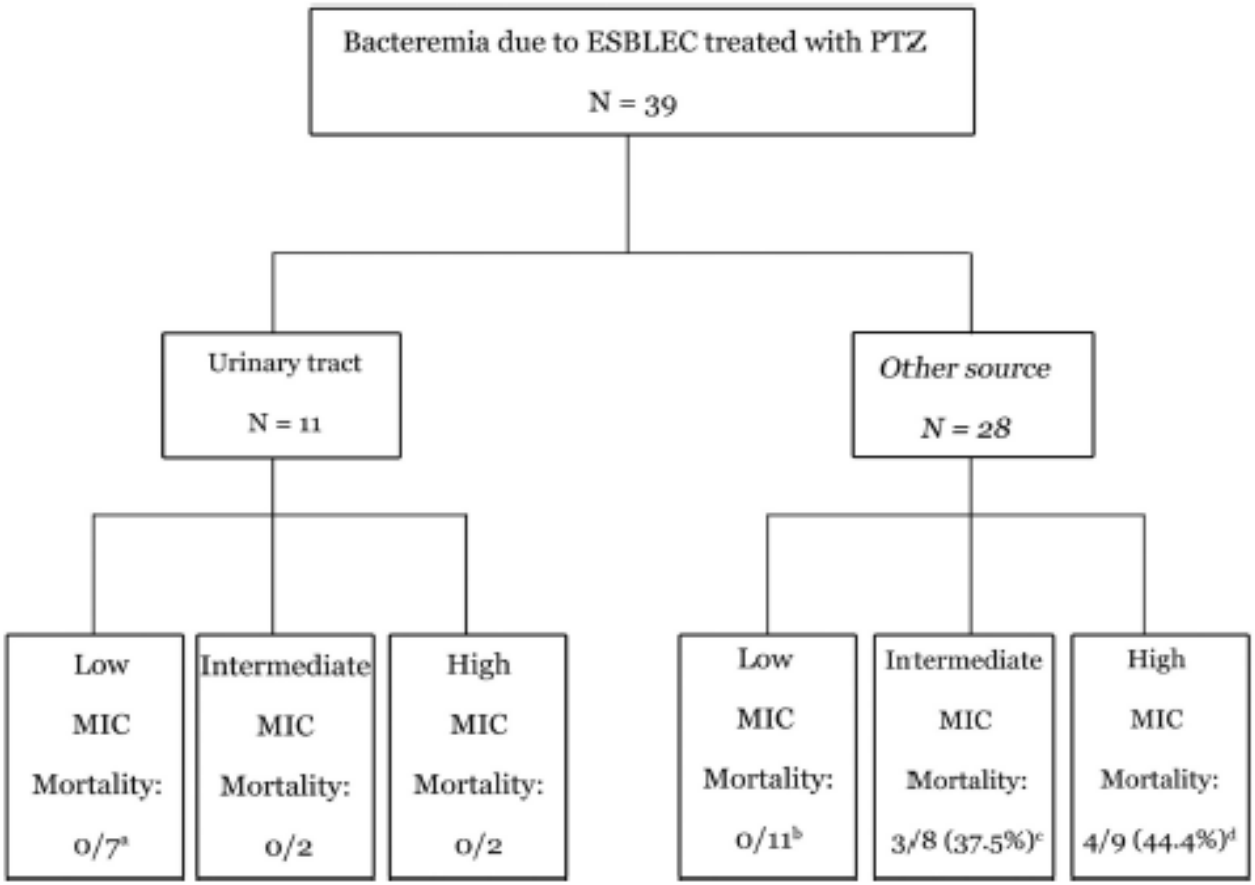
C. Neulier [a], G. Birgand [a,*,b,c], É. Ruppé [d], L. Armand-Lefèvre [d], I. Lolom [a], Y. Yazdanpanah [b,c,e], J.-C. Lucet [a,b,c], A. Andremont [d]

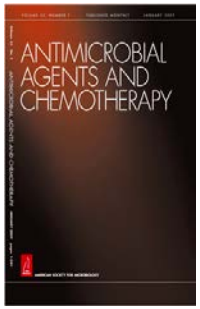


2014

Impact of the MIC of Piperacillin-Tazobactam on the Outcome of Patients with Bacteremia Due to Extended-Spectrum-β-Lactamase-Producing *Escherichia coli*

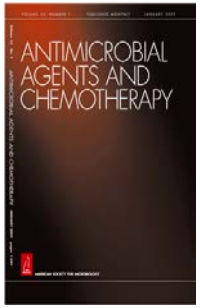
Pilar Retamar,[a] Lorena López-Cerero,[a] Miguel Angel Muniain,[a,b] Álvaro Pascual,[a,c] Jesús Rodríguez-Baño,[a,b] the ESBL-REIPI/GEIH Group





2013

ANTIMICROBIAL AGENTS AND CHEMOTHERAPY, Dec. 2001, p. 3548–3554
0066-4804/01/$04.00+0 DOI: 10.1128/AAC.45.12.3548–3554.2001



Cefepime, Piperacillin-Tazobactam, and the Inoculum Effect in Tests with Extended-Spectrum β-Lactamase-Producing *Enterobacteriaceae*

KENNETH S. THOMSON* AND ELLEN SMITH MOLAND

TABLE 1. Representative isogenic *E. coli* strains: standard- and high-inoculum MICs

Strain	Enzyme	MIC (μg/ml) of drug at indicated inoculum (CFU/ml)[a]															
		MEM		CTT		CTX		CAZ		CRO		FEP		ATM		TZP	
		10^5	10^7	10^5	10^7	10^5	10^7	10^5	10^7	10^5	10^7	10^5	10^7	10^5	10^7	10^5	10^7
PAB-C14	SHV-2	0.03	0.03	0.25	0.5	16	512	16	32	32	512	8	>128	8	64	4	256
PAB-CS7	SHV-7	0.03	0.03	0.25	1	32	>1,024	256	1,024	64	>1,024	8	>128	1,024	1,024	2	64
PAB-C43	TEM-43	0.03	0.06	0.25	0.25	0.5	8	64	1,024	1	32	1	32	16	128	2	4
PAB-C12	TEM-12	0.03	0.06	0.25	0.25	0.25	8	32	512	0.25	8	4	>128	2	16	2	8
PAB-C10	TEM-10	0.03	0.03	0.25	1	2	32	256	>1,024	4	64	4	>128	128	512	2	2
PAB-C-4	TEM-4	0.03	0.03	1	1	32	>1,024	32	128	32	>1,024	4	>128	32	64	2	4
PAB-C3	TEM-3	0.03	0.06	0.5	0.5	16	>1,024	32	256	16	>1,024	4	>128	16	32	2	4

[a] Abbreviations: MEM, meropenem; CTT, cefoteten; CTX, cefotaxime; CAZ, ceftazidime; CRO, ceftriaxone; FEP, cefepime; ATM, aztreonam; TZP, piperacillin-tazobactam.

TABLE 2. MIC and susceptibility data for non-isogenic *E. coli* isolates[a]

Inoculum (CFU/ml) (n) and antibiotic	MIC[c] (μg/ml)			% Susceptible[b,c]
	Range	50%	90%	
10^5 (19)				
Meropenem	≤0.015–0.06	≤0.015	0.03	100
Cefoteten	0.06–2	0.25	1	100
Cefotaxime	0.25–512	2	64	79
Ceftazidime	1–1,024	32	256	32
Ceftriaxone	0.25–1,024	4	128	79
Cefepime	0.25–128	2	16	79
Aztreonam	0.5–128	16	128	47
Pip-Tazo[d]	1–32	2	8	95
10^7 (19)				
Meropenem	0.03–0.5	0.06	0.12	100 (1/19)
Cefoteten	0.12–16	1	4	100 (4/19)
Cefotaxime	2–>1,024	256	>1,024	21 (17/18)
Ceftazidime	4–>1,024	>1,024	>1,024	5 (11/16)
Ceftriaxone	8–>1,024	1,024	>1,024	5 (18/19)
Cefepime	4–>128	>128	>128	5 (18/18)
Aztreonam	4–>1,024	>1,024	>1,024	16 (16/19)
Pip-Tazo	1–1,024	8	1,024	58 (8/19)

TABLE 3. MIC and susceptibility data for *K. pneumoniae*

Inoculum (CFU/ml) (*n*) and antibiotic	MIC[c] (μg/ml)			% Susceptible[a,b]
	Range	50%	90%	
10^5 (18)				
Meropenem	≤0.015–0.12	0.03	0.06	100
Cefoteten	0.06–2	0.25	1	100
Cefotaxime	0.5–64	4	32	67
Ceftazidime	1–>1,024	256	1,024	11
Ceftriaxone	1–128	4	64	56
Cefepime	0.5–16	4	16	89
Aztreonam	0.5–>1,024	64	512	22
Pip-Tazo	2–1,024	8	1,024	67
10^7 (18)				
Meropenem	0.03–4	0.125	4	100 (6/18)
Cefoteten	0.06–32	2	16	90 (6/18)
Cefotaxime	8–>1,024	256	>1,024	5 (18/18)
Ceftazidime	8–>1,024	>1,024	>1,024	5 (6/8)
Ceftriaxone	128–>1,024	>1,024	>1,024	0 (18/18)
Cefepime	>128	>128	>128	0 (18/18)
Aztreonam	4–>1,024	>1,024	>1,024	11 (8/12)
Pip-Tazo	4–>1,024	1,024	>1,024	22 (8/14)

In vitro and *in vivo* activities of piperacillin-tazobactam and meropenem at different inoculum sizes of ESBL-producing *Klebsiella pneumoniae*

Y. Harada[1,2], Y. Morinaga[1,2], N. Kaku[1,2], S. Nakamura[2], N. Uno[1], H. Hasegawa[1], K. Izumikawa[2], S. Kohno[2,3] and K. Yanagihara[1,2]

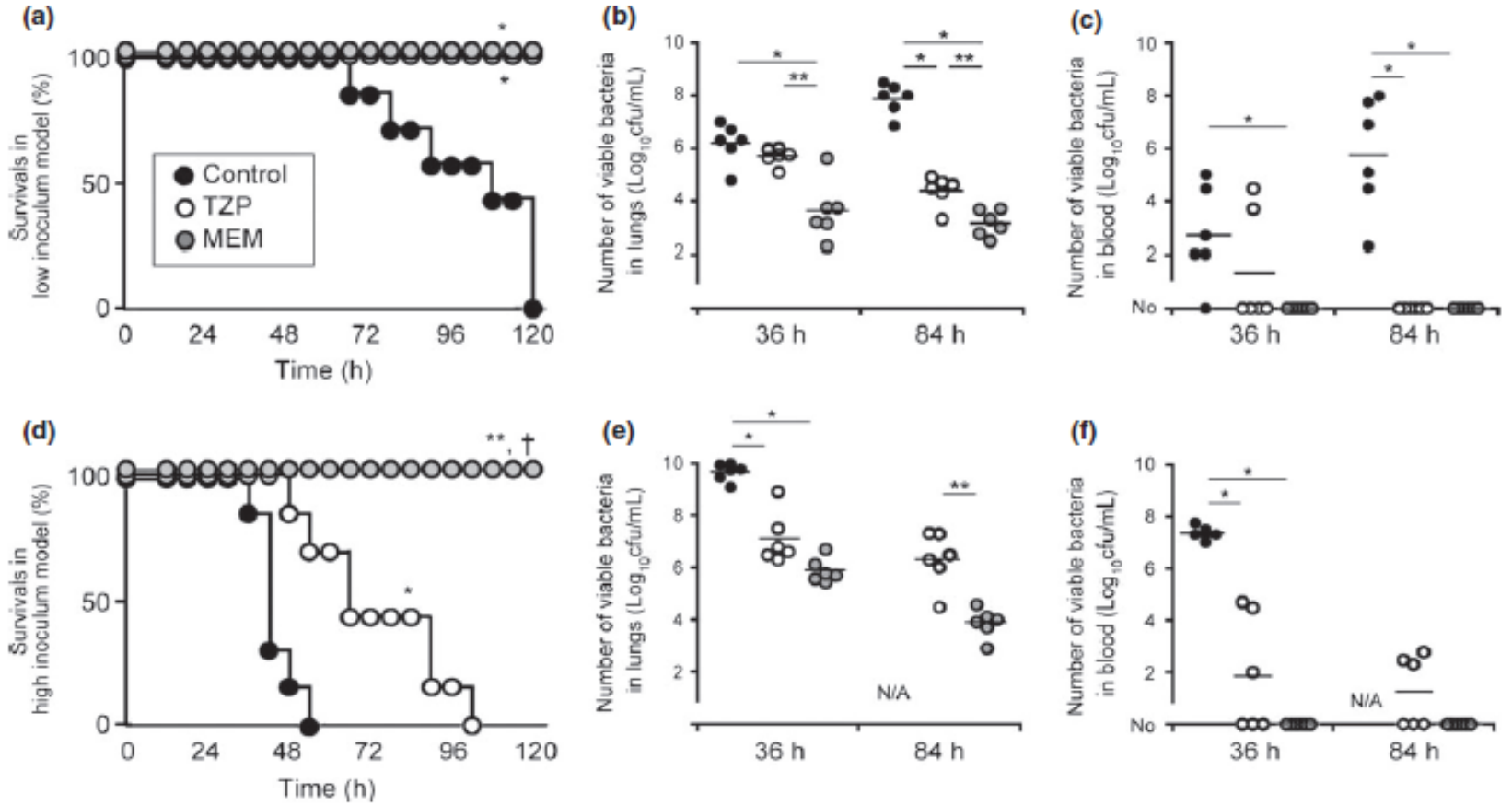
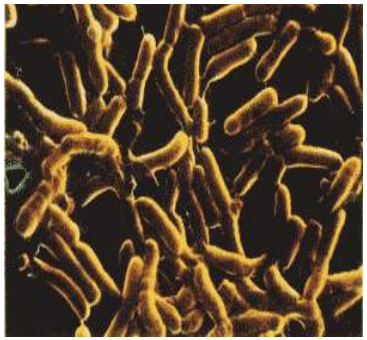


FIG. 4. Survival and bacteriological examinations from the *in vivo* study. The inoculum effects were studied *in vivo* using a mouse model of pneumonia induced by ESBL-producing *Klebsiella pneumoniae* at the standard (a, b and c) and high (d, e and f) inocula. Mice were treated with saline (control, filled circles), piperacillin-tazobactam (open circles) or meropenem (gray circles) according to the pharmacokinetically-designed treatment



inoculum élevé :

Sepsis sévère ou choc septique

Pneumonies

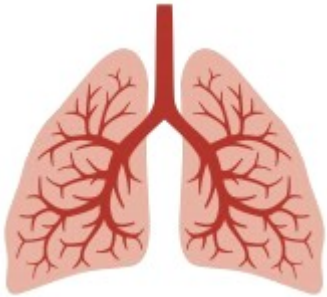
Arthrites

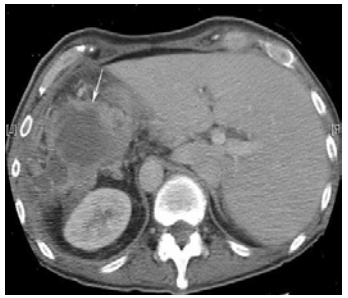
Infections intraabdo

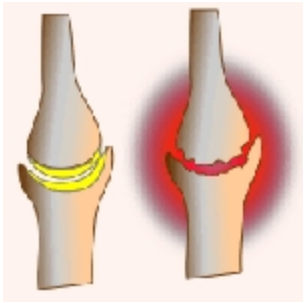
Abcès

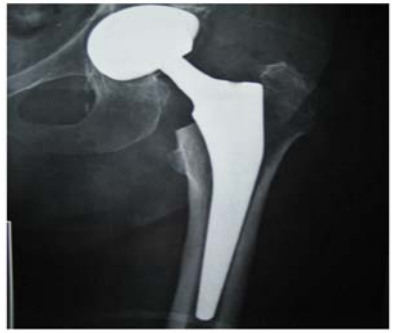
Infections sur matériel étranger

Endocardites, méningites…









Cas clinique

- Fracture prothétique sur prothèse totale de hanche et fracture de l'humérus
- Bloc opératoire
- Ofloxacine en post op (IU)
- Sortie
- Hyperthermie au domicile
- Sepsis sévère : ceftriaxone + lévofloxacine
- Épanchement périarticulaire + douleurs locales
- HC positives à E coli : tazocilline

Antécédents : Familiaux :

[redacted]

Edition du 07 Août 2014

[redacted]

Sexe : M

Date d'entrée : 04/08/2014

N° identification patient : [redacted]

N° d'hospitalisation :

N° de dossier :

Date du prélèvement : 05/08/2014

Dossier terminé le 07/08/2014

Service : Réanimation polyvalente - Uf : 6023

BMR

Nature du prélèvement : **HEMOCULTURES**

Germe : **Escherichia coli**

Phénotype(s) : BLSE +

A N T I B I O G R A M M E

Antibiotiques	Spécialités	D	Dmin	Dmax	Résultats	CMI en mg/l	Note
Ampicilline	totapen, clamoxyl,				résistant	>=32	
Amoxy+ac.clavul	augmentin				résistant	>=32	
Ticarcilline	ticarpen				résistant	>=128	
Pipér-Tazobactam	tazocilline				**sensible**	8	
Céfalotine	keflin, keforal				résistant	>=64	
Céfoxitine	(mefoxin), apacef				**sensible**	8	
Céfotaxime	claforan, rocéphine				résistant	>=64	
Ceftazidime	fortum				résistant	>=64	
Céfépime	axepim	12	21	26	résistant		
Imipénème	tiénam				**sensible**	<=0,25	
Ertapénème	invanz				**sensible**	<=0,5	
Gentamicine	gentalline				résistant	>=16	
Tobramycine	nebcine				résistant	>=16	
Amikacine	amiklin				* intermédiaire	8	
Acide nalidixique	(négram), pipram				résistant	>=32	
Ofloxacine	Oflocet				résistant	>=8	
Ciprofloxacine	ciflox				résistant	>=4	
Cotrimoxazole	bactrim, eusaprim				résistant	>=320	
Nitrofurantoïne	furadoïne				**sensible**	64	

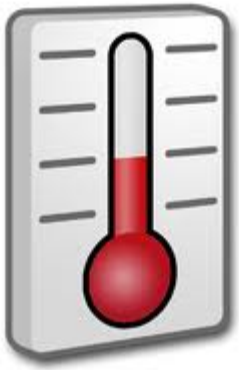
Méthode : Automate VITEK - test : ATB AST 233 BGN - Expertise : BACTERIO (* résultat interprété)

Remarques sur l'antibiogramme

BACTERIE MULTI-RESISTANTE

Résultat validé biologiquement par: [redacted] le 07/08/2014 - 10:30

Le patient est toujours fébrile après 48 h de tazocilline



[redacted]

Edition du 09 Août 2014

Date d'entrée : 04/08/2014 Sexe : M
N° Identification patient : [redacted]
N° d'hospitalisation : 1436572
N° de dossier : 07/08/2014
Date du prélèvement :
Dossier terminé le 09/08/2014

Service : Réanimation polyvalente - Uf : 6023

BMR

Nature du prélèvement : HEMOCULTURES N°1

Germe : **Escherichia coli**
Phénotype(s) : BLSE +

A N T I B I O G R A M M E

Antibiotiques	Spécialités	D	Dmin Dmax	Résultats	CMI en mg/l	Nc
Ampicilline	totapen, clamoxyl,			résistant	>=32	
Amoxy+ac.clavul	augmentin			résistant	>=32	
Ticarcilline	ticarpen			résistant	>=128	
Pipér-Tazobactam	tazocilline			résistant	64	
Céfalotine	keflin, keforal			résistant	>=64	
Céfoxitine	(mefoxin), apacef			**sensible**	8	
Céfotaxime	claforan, rocéphine			résistant	>=64	
Ceftazidime	fortum			résistant	>=64	
Céfépime	axepim	14	21- 26	résistant		
Imipénème	tiénam			**sensible**	<=0,25	
Ertapénème	invanz			**sensible**	<=0,5	
Tobramycine	nebcine			résistant	8	
Gentamicine	gentalline			résistant	>=16	
Amikacine	amiklin			**sensible**	<=2	
Acide nalidixique	(négram), pipram			résistant	>=32	
Ofloxacine	Oflocet			résistant	>=8	
Ciprofloxacine	ciflox			résistant	>=4	
Cotrimoxazole	bactrim, eusaprim			résistant	>=320	
Nitrofurantoïne	furadoïne			**sensible**	64	

Méthode : Automate VITEK - test : ATB AST 233 BGN - Expertise : BACTERIO

Remarques sur l'antibiogramme
BACTERIE MULTI-RESISTANTE

Résultat validé biologiquement par: Sylvie LEBRUN le 09/08/2014 - 09:32

Carbapenems versus alternative antibiotics for the treatment of bacteraemia due to Enterobacteriaceae producing extended-spectrum β-lactamases: a systematic review and meta-analysis

Konstantinos Z. Vardakas[1,2], Giannoula S. Tansarli[1], Petros I. Rafailidis[1,2] and Matthew E. Falagas[1–3]*

2012

Table 3. Summary of RR estimates on mortality of patients with ESBL-positive Enterobacteriaceae bacteraemia according to antibiotic comparisons

		Definitive treatment		Empirical treatment	
Antibiotic comparisons	No. of studies, D/E	no. of patients, *n/N* (%)	RR (95% CI), model used	no. of patients, *n/N* (%)	RR (95% CI), model used
Appropriate versus inappropriate	NA/11	NA	NA	89/406 (22) versus 141/370 (38)	**0.64 (0.44–0.88) REM (I^2 44%)**
Carbapenems versus BL/BLIs	11/13	75/398 (19) versus 24/118 (20)	0.52 (0.23–1.13) REM (I^2 71%)	64/317 (20) versus 56/273 (21)	0.91 (0.66–1.25) FEM (I^2 15%)
Carbapenems versus non-BL/BLIs	13/11	69/373 (18) versus 64/274 (23)	**0.65 (0.47–0.91) FEM (I^2 26%)**	30/199 (15) versus 85/304 (28)	**0.50 (0.33–0.77) FEM (I^2 13%)**
Carbapenems versus quinolones	7/8	38/300 (13) versus 13/80 (16)	0.63 (0.34–1.15) FEM (I^2 0%)	21/164 (13) versus 24/65 (37)	**0.34 (0.19–0.62) FEM (I^2 0%)**
Carbapenems versus cephalosporins	10/8	39/285 (14) versus 40/125 (32)	**0.34 (0.22–0.52) FEM (I^2 0%)**	19/100 (19) versus 52/170 (31)	**0.51 (0.32–0.82) FEM (I^2 0%)**
Carbapenems versus all	14/13	89/493 (18) versus 65/308 (21)	0.80 (0.51–1.26) REM (I^2 40%)	64/317 (20) versus 141/577 (24)	0.76 (0.56–1.02) FEM (I^2 18%)
BL/BLI versus non-BLBLIs	10/12	19/64 (30) versus 50/202 (25)	1.59 (0.83–3.06) REM (I^2 48%)	38/193 (20) versus 86/309 (28)	0.82 (0.48–1.41) REM (I^2 53%)

Carbapenems versus alternative antibiotics for the treatment of bacteraemia due to Enterobacteriaceae producing extended-spectrum β-lactamases: a systematic review and meta-analysis

Konstantinos Z. Vardakas[1,2], Giannoula S. Tansarli[1], Petros I. Rafailidis[1,2] and Matthew E. Falagas[1–3]*

- tt définitif par un carbapénème
- La plupart des études n'étaient pas désignées pour étudier les alternatives
- Pas de données sur les doses administrées et la durée de traitement
- La source de la bactériémies varie (population hétérogène)
- Une bactériémie à K. pneumoniae est plus grave qu'une bactériémie à E coli
- Études incluant des infections communautaires, nosocomiales ou associées aux soins
- Dans certaines études on ne sait pas s'il y a eu monothérapie ou bithérapie
- Les patients les plus sévères ont les carbapénèmes

β-Lactam/β-Lactam Inhibitor Combinations for the Treatment of Bacteremia Due to Extended-Spectrum β-Lactamase–Producing *Escherichia coli*: A Post Hoc Analysis of Prospective Cohorts

Jesús Rodríguez-Baño,[1,2] María Dolores Navarro,[1] Pilar Retamar,[1] Encarnación Picón,[1] Álvaro Pascual,[1,3] and the Extended-Spectrum Beta-Lactamases–Red Española de Investigación en Patología Infecciosa/Grupo de Estudio de Infección Hospitalaria Group[a]

2012

Conclusions. These results suggest that AMC and PTZ are suitable alternatives to carbapenems for treating patients with bloodstream infections due to ESBL-EC if active in vitro and would be particularly useful as definitive therapy.

Table 2. Characteristics of Patients With Bloodstream Infections (BSIs) Caused by Extended-Spectrum β-Lactamase–Producing *Escherichia coli*, According to Therapy[a]

	Empirical Therapy Cohort			Definitive Therapy Cohort		
Characteristic	BLBLI (n = 72)	Carbapenem (n = 31)	*P*	BLBLI (n = 54)	Carbapenem (n = 120)	*P*
Age, median y (IQR)	69 (59–80)	60 (52–78)	.1[b]	67 (56–83)	70 (55–78)	.3[b]
Male sex	29 (40.3)	11 (35.5)	.6	34 (63)	70 (58.3)	.5
→ Nosocomial acquisition	26 (36.1)	24 (77.4)	<.001	18 (33.3)	67 (55.8)	.006
Charlson index, median, (IQR)	2 (1–5)	2 (1–5)	.6[b]	2.5 (1–5)	3 (1–5)	.5[b]
Cancer	21 (31.9)	11 (35.5)	.7	15 (27.8)	43 (35.8)	.2
→ Immunosuppression	5 (6.9)	5 (16.1)	.1[c]	3 (5.6)	15 (12.5)	.1
→ Neutropenia	2 (2.8)	3 (9.7)	.1[c]	0	7 (5.8)	.1[c]
→ Urinary or biliary tract as source	52 (72.2)	18 (58.1)	.1	42 (77.8)	79 (65.8)	.1
→ ICU admission	7 (9.9)	2 (6.7)	.7[c]	4 (7.4)	18 (15.4)	.1
→ Severe sepsis or shock at presentation	14 (19.4)	9 (29.0)	.2	8 (14.8)	32 (26.7)	.08
Pitt score, median (IQR)	1 (0–2)	1 (0–2)	.7[b]	1 (0–2)	1 (1–2)	.04[b]

Carbapénèmes et bactériémies BLSE +

- Tout le temps en empirique
- Attention aux CMI
- Attention aux sites que l’on veut éradiquer et aux patients que l’on veut traiter


Moi
BIG
Lui