

Cost of off-label antibiotic therapy in bone and joint infection (BJI): prospective 2-year study in a complex BJI reference center

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Aim

Due to the emergence of drug-resistant micro-organisms and side-effect rates under conventional treatment, drugs are increasingly administered off-label to treat BJI.

These new antibiotics are, however, more expensive, which may hinder their use in post-acute care, although there are no precise data in France regarding the volume and cost of such off-label prescriptions.

The objective of the present study was to estimate the cost of using off-label antibiotics in patients managed in a chronic BJI reference center.

Method

A prospective cohort study included all patients treated in the chronic BJI reference center of Lyon in 2014 and 2015 with daptomycin, ertapenem, linezolid, ceftaroline, tigecycline and/or colimycine.

Patient characteristics, BJIs and prescription data (dose, duration) were collected throughout the care pathway: admission to the surgery and/or medical department of the reference center or to a peripheral hospital, post-acute care structure, and at home.

Overall costs for off-label prescriptions were estimated taking account of variations in purchase price invoiced to the reference center.

Results

In 2014 and 2015 respectively, 410 and 473 patients were treated in the BJI reference, of whom respectively 185 (45%) and 220 (47%) received off-label antibiotic therapy. All indications were validated in a multidisciplinary team meeting. The male:female ratio was 1.52. The median age of patients was 62 years (IQR +/-27 years). The median BMI was 25 and the median ASA score was 2. Two hundred and thirteen (53%) patients presented an infection of orthopaedic device for which 119 (29%) with prosthetic joint infection and 90 (22%) with osteosynthesis infection. Infection of orthopaedic device was acute (<1 month) and chronic (>3 months) for 106 (51%) and 72 (35%) patients, respectively.

The molecules comprised daptomycin (85 [46%] in 2014 and 109 [50%] in 2015), linezolid (37 [20%] and 48 [22%]), ertapenem (39 [21%] and 38 [17%]), colimycine (12 [6%] and 12 [5%]), tigecycline (11 [6%] and 10 [5%]), and ceftaroline (1 [1%] and 3 [1%]) (Tableau 1).

Mean prescription times were long but stable: 52 days in 2014 and 50 days in 2015. Total cost of off-label antibiotic therapy was €1,034,000 in 2014 and €1,290,000 in 2015, daptomycin constituting the largest cost: €610,000 [59% of total] in 2014, and €840,000 [65%] in 2015 (tableau 1). Total cost in post-acute care fell from €219,000 (21% of total off-label antibiotics cost) in 2014 to €174,000 (14%) in 2015 (tableau 2) in parallel of a decrease in the length of stays (tableau 2). Between 2014 and 2015, 21.5% of the patients where managed in post-acute care. Colimycin and ceftaroline, that were not refund in 2014 and 2015 by the health authorities, were less prescribed than the other off-label antibiotics.

	2014				2015			
	Number of patients	Average duration / patient	Cumulative number of days	Total amount	Number of patients	Average duration / patient	Cumulative number of days	Total amount
daptomycin	85	51	4355	609 340 €	109	49	5404	838 897 €
ertapenem	39	76	2981	167 051 €	38	63	2410	124 098 €
colimycin	12	35	422	28 404 €	12	69	833	50 166 €
tigecyclin	11	64	704	70 400 €	10	42	418	41 300 €
linezolid	37	33	1236	150 975 €	48	32	1551	183 540 €
ceftaroline	1	41	41	7 440 €	3	113	339	54 219 €
	185	52	9 739	1 033 610 €	220	50	10 955	1 292 220 €

Tableau 1 : Description of the dispensations of off-label antibiotics between 2014 and 2015

	Number of days in pac*		Cost for pac*	
	2014	2015	2014	2015
	daptomycin	855	893	108 585 €
ertapenem	624	252	46 176 €	18 648 €
colimycin	107	210	6 741 €	13 230 €
tigecyclin	247	48	24 700 €	9 600 €
linezolid	259	70	32 634 €	8 400 €
ceftaroline	0	57	0	10 602 €
	2092	1530	218 836 €	173 891 €

Tableau 2 : Description of management by post-acute care for patients having off-label antibiotics between 2014 and 2015
*pac = post-acute care

Conclusion

Off-label antibiotic therapy incurs considerable cost in BJI treatment. Post-acute care structures do not bear the major part of the cost.

Use of generic drugs, notably to replace linezolid, and soon daptomycin, should drastically reduce costs in 2017.

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Lyon BJI Study group

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