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 colimycin. 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%]), colimycin (12 [6%] and 12 [5%]), tigecycline (11 [6%] and 10 [5%]), and ceftaroline (1 [1%] and 3 [1%]) (Table 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.

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

Tableau 2 : Description of management by post-care cost 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.
