Assessment of drug adherence to oral antibacterial therapy in bone and joint infections: a pilot study

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Introduction

Sustained and maximal adherence to drug therapy is a major issue for prolonged treatment. Bone and joint infections (BJI) often require prolonged antibacterial therapy over several weeks. Little is known about drug adherence in this condition. The objectives of this pilot study were to assess drug adherence to oral antibacterial therapy in patients with BJI and identify potential determinants of adherence.

Patients and methods

This was a prospective study performed in the reference center for complicated BJI in Lyon, France. Adult patients with BJI who received at least one oral antibacterial for ≥ 6 weeks were included. Drug adherence to antibiotic was assessed by phone call at 6 weeks and 3 months, when applicable, by using a modified version of the Girerd's questionnaire [1]. The proportion of high (score of 6/6), moderate (4-5/6), and poor (<4/6) adherence were calculated at 6 weeks and 3 months and compared (Mc Nemar test). The influence of available covariates on the rate of high adherence was examined by using logistic regression analysis with computation of odds-ratios (OR).

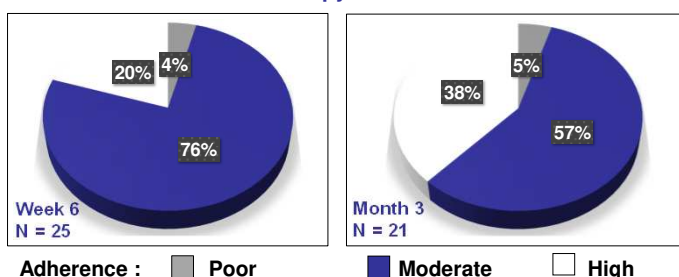*Reference: 1. Girerd et al. Arch Mal Coeur Vaiss. 2001 Aug;94(8):839-42*

Results

Characteristics of the study population are shown in **Table 1.** The observed rates of high, moderate, and poor adherence after 6 weeks and 3 months of therapy are shown in **Figure 1**. The mean adherence score was 4.8 ± 0.8 and 5.1 ± 0.9 at 6 weeks and 3 months, respectively (p = 0.25). **Figure 2** display this stability of drug adherence. At 6 weeks. a number of antimicrobial drugs ≥ 2 (OR = 0.25 [0.02 – 2.6]), and a number of daily intakes ≥ 3 (OR = 0.17 [0.02 – 1.6]) appeared to be associated with lower probability of high adherence, although the results did not reach statistical significance. At 3 months. a degree level ≥ baccalaureate was associated with increased probability of high adherence (58% versus 11%. OR = 11.2 [1.04 – 120.4]), as shown in **Table 2.**

Table 1. Characteristics of the study population

Number of patients (women/men)	30 (10/20)
Age (years)	63 ± 15
Infection site	Lower limb (n=23)
	Head (n=3)
	Spine (n=3)
	Upper limb (n=1)
Implant-associated infection	24/30
Setting of antimicrobial therapy	Ambulatory (n = 10) Home hospitalization (n = 5) Inpatient (n = 4) Rehabilitation centre (n = 11)
Antimicrobial therapy	Single drug (n = 19) Two drug (n = 11) Top 5 agents: rifampicin (n = 8); clindamycin (n=8); levofloxacin (n = 6); métronidazole (n = 4); ofloxacin (n = 4)

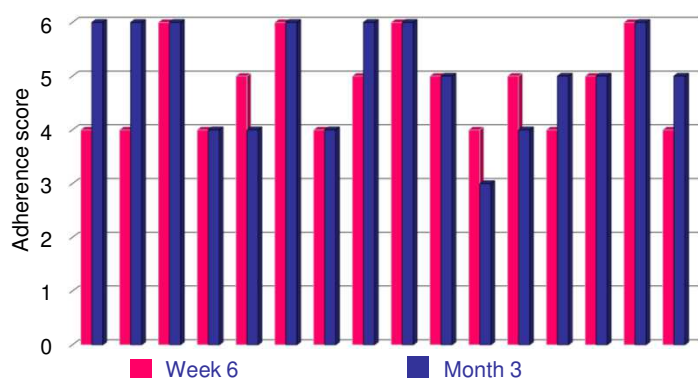### Figure 1. Rates of poor, moderate, and high adherence at 6 weeks and 3 months of therapy

Week 6 N = 25

Month 3 N = 21

Adherence : Poor · Moderate · High

Figure 2. Adherence score after 6 weeks and 3 months of antimicrobial therapy in each patient evaluated twice (n = 16)

Week 6 · Month 3

Table 2. Logistic regression analysis of variable associated with adherence at 3 months

Variable	Patients with high adherence	Patients with low/moderate adherence	p-value	OR* [IC95%]
Men	3 (23)	10 (77)	0.16	0.18 [0.03-1.24]
Women	5 (63)	3 (37)		
Education				
< baccalaureate	1 (11)	8 (89)	0.07	11.2 [1.04-120.4]
≥ baccalaureate*	7 (58)	5 (42)		
Co-prescribed drugs				
<5	7 (54)	6 (46)	0.09	0.122 [0.01-1.30]
≥5*	1 (12)	7 (88)		
Oral antimicrobials	1.1 ± 0.3	1.5 ± 0.5	0.13	0.167 [0.02-1.77]
Oral antimicrobials				
1	7 (50)	7 (50)	0.17	0.167 [0.02-1.77]
>1*	1 (14)	6 (86)		
Antimicrobial daily intakes	2.5 ± 0.9	3.1 ± 1	0.21	0.53 [0,20-1,44]
Daily intakes				
1 or 2	4 (57)	3 (43)	0.35	0.30 [0,05-1,99]
>2*	4 (29)	10 (71)		

*The * sign indicates the variable whose effect is evaluated in the model*

Conclusions

These are the first data available on drug adherence to antibacterial therapy in BJI. Although the results are preliminary and limited by sample size. they suggest that adherence to antimicrobial therapy is not optimal but stable over 3 months. Further research is necessary to identify determinants of drug adherence in this setting.