

# Infections in an inpatient rheumatology unit: how big is the problem?

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## ABSTRACT

Patients with rheumatic diseases are at high risk of infections. As quantification and characterization of infections in daily practice is a crucial exercise to delineate strategies to overcome this problem, we aimed to describe the prevalence of infections in an inpatient rheumatology unit. A cross-sectional analysis of all patients admitted at the São João Hospital Centre Rheumatology Unit, between January 1st 2012 and December 31st 2013, was performed. We found a 31.7% (n=79) period prevalence of infection and a total number of infections of 97 (1.23 infections per patient). Infections were the admission reason in 17.6% (n=44) and hospital acquired in 19.0% (n=15) of the cases. The urinary tract was the most commonly affected (32.0%; n=31) and *Escherichia coli* (17.5%; n=17) the most frequently identified infectious agent. Infection prolonged the hospital length of stay in 34.2% (n=27) of the cases but any death occurred as a direct consequence of it. Patients with infection were older, had longer rheumatic disease duration and longer hospital length of stay than those without infection. We conclude that the prevalence of infection in our inpatient population is high but most cases were non complicated, easily treated with common antibiotics and, importantly, not associated with higher lethality.

**Keywords:** Infection; Risk profiles; Rheumatic diseases; Immunosuppression

Patients with rheumatic diseases are at high risk of infections as a consequence of immunological dysfunction, comorbidities and treatments<sup>1</sup>. In the last two decades several immunomodulatory drugs, targeting different key inflammatory molecules, have been developed. As clinicians, we have to be prepared to deal

with their potential side effects, namely, infections<sup>2</sup>. Furthermore, infections remain an important cause of morbidity and mortality in patients with rheumatic diseases<sup>3</sup>. The quantification and characterization of infections in daily practice is a crucial exercise to delineate strategies to overcome this problem.

We aimed to evaluate and characterize the prevalence of infections in an inpatient rheumatology unit.

A cross-sectional analysis of all patients admitted at the São João Hospital Centre Rheumatology Unit, between January 1st 2012 and December 31st 2013, was performed. Data was collected on demographic characteristics and also on previous and current clinical history. Statistical tests for independent samples were selected according to variables distribution and significance level was set at  $\alpha=0.05$ . Statistical analysis was performed using IBM SPSS Statistics 21.

Between the above-mentioned period, a total of 249 admissions were recorded. In 31.7% (n=79) of the admissions, at least one infection was recorded, and in 17.6% (n=44) it was the admission reason. As each patient may have developed more than one infection per admission, the total number of infections was 97 (1.23 infections per patient). Infection was hospital acquired in 19.0% (n=15) of the cases.

Of the 97 infections recorded, the urinary tract was the most commonly affected (32.0%; n=31) followed by the skin (20.6%; n=20) and respiratory tract (23.7%; n=23). It was also recorded 9 cases of gastrointestinal infections, 5 of septic arthritis, 3 of osteomyelitis, 3 of disseminated infection, 1 of rickettsiosis, 1 of syphilis and 1 of human immunodeficiency virus infection. The most frequently isolated infectious agents were *Escherichia coli* (17.5%; n=17) and *Staphylococcus aureus* (12.4%; n=12) but in 30.9% (n=30) of the cases, the agent was unknown. The association of amoxicillin and clavulanic acid was the most prescribed antibiotic (18.3%; n=24) followed by ciprofloxacin (14.5%; n=19). Infection prolonged the hospital length of stay

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**TABLE I. CLINICAL CHARACTERISTICS ACCORDING TO THE PRESENCE OF INFECTION**

	Without Infection (n=170)	With Infection (n=79)	p
Gender (female, %)	70.6	74.7	NS
Age, years (mean, standard deviation)	54.8 (18.86)	59.0 (14.98)	0.049
Disease Duration, years [median (min-max)]	7 (0-57)	11 (0-56)	0.002
Hospital length of stay, days [median (min-max)]	8 (1-54)	10 (1-65)	0.001
Corticosteroids (%)	58.2	60.4	NS
Dose, mg [median (min-max)]	5 (0-60)	5 (0-60)	-
Methotrexate (%)	20.6	29.1	NS
Leflunomide (%)	4.7	5.1	NS
Azathioprine (%)	4.1	3.8	NS
Cyclophosphamide (%)	4.1	3.8	NS
Mycophenolate mofetil (%)	4.1	6.3	NS
Others (%)	12.4	13.9	NS
Number of DMARDs [corticosteroids included (%)]			
0	55.9	46.8	NS
1	37.6	41.8	NS
2	5.9	11.4	NS
3	0.6	-	-
Biotherapies (%)	11.2	15.2	NS

NS: non-significant; Min: minimum; Max: maximum; DMARDs: Disease-modifying antirheumatic drugs.

in 34.2% (n=27) of the cases but any death occurred as a direct consequence of it.

Patients with infection were older, had longer rheumatic disease duration and longer hospital length of stay than those without infection (Table I). Comparison of other variables was not statistically significant.

We found a 31.7% period prevalence of infection in our inpatient rheumatology unit, which seems to be higher than previous published data<sup>3-5</sup>. However, direct comparison is difficult as most published data is focused on specific rheumatic diseases and our study is, as far as we know, the first to analyse them altogether. This option was made to describe the real daily practice scenario as we deal with very different patients and diseases.

This study has two main limitations: the retrospective design, leading to some difficulties in results interpretation (for example, is difficult to conclude if prolonged hospital length of stay is a cause or consequence of infection); the small sample size, affecting the power to detect more statistical significant differences between infected and non-infected patients.

We conclude that the prevalence of infection in our inpatient population is high and related with higher age and prolonged rheumatic disease duration. Despite

the presence of multiple comorbidities and immunosuppressive treatments, most infection cases were non complicated, easily treated with common antibiotics and, importantly, not associated with higher lethality.

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