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Rheumatoid arthritis - comorbidity and clinical aspects

SAT0062

INCIDENCE OF STAPHYLOCOCCUS AUREUS BACTEREMIA IN PATIENTS WITH RHEUMATOID ARTHRITIS: A NATIONWIDE COHORT STUDY

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Background: *Staphylococcus aureus* is a frequent cause of bacteremia (SAB) associated with high mortality and morbidity. Patients with rheumatoid arthritis (RA) are at increased risk of septic arthritis and prosthetic joint infection with *S. aureus*.
Objectives: To assess the incidence rate (IR) of first-time SAB in patients with RA and to estimate the incidence rate ratio (IRR) of SAB with a general population cohort without RA serving as the reference.
Methods: Individuals with no prior history of SAB or RA were included consecutively from 31 December 1996, their 18th birthday or date of immigration, whichever came latest, and followed until first-time SAB, death, emigration or 31 December 2017, whichever came first. Information on RA diagnosis, vital status, age, sex, place of residence, comorbidities, medication and first-time SAB were achieved on an individual level through cross-linkage between five virtually complete Danish nationwide registries (Civil Registration System, National Patient Registry, Register of Medicinal Product Statistics, DANBIO rheumatology registry and the SAB database). We used Poisson regression to estimate adjusted IRRs overall and stratified by age and sex.
Results: In total, 6,127,150 individuals were included of whom 34,627 individuals developed RA. In the RA cohort, 228 first-time SAB events occurred during 283,186 person years (PY) of follow-up (IR 80.5/100,000 PY) compared with 25,268 events during 87,521,120 PY of follow-up in the general population cohort (IR 28.9/100,000 PY). Median follow-up was 7.2 years (IQR 3.5-12.3) after RA diagnosis and 18.7 years (IQR 6.8-21) in the general population cohort. Individuals with RA who developed SAB were more often women, had an orthopaedic implant and had recent use of glucocorticoids compared with individuals with SAB without RA. (Table 1) IRs of SAB were higher among patients with RA compared with the general population in all age categories. The IRs increased with age and were higher in men, both in patients with RA and in the general population cohort. After adjustment, the IRR remained higher for individuals younger than 70 years with RA compared with the general population but was similar for older individuals. (Figure 1)

Conclusion: In this nationwide cohort with more than 25,000 observed first-time SAB events, patients with RA younger than 70 years old had a 1.5-2 times higher incidence rate compared with the general population. The significance of anti-rheumatic treatments on risk and the prognosis of SAB in patients with RA remain to be explored.
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Table 1 Characteristics of patients with RA at time of RA diagnosis and patients with SAB with/without RA at time of SAB diagnosis

Characteristic, n (%)	At RA diagnosis		At first-time SAB
	RA (n=34,627)	RA (n=228)	Non-RA (n=25,268)
Age, years (IQR)	59.8 (48.8-70.3)	71.8 (62.3-79.2)	69.7 (57.7-79.7)
Female, %	69%	59%	38%
Diabetes mellitus	2,467 (7.1%)	51 (22.4%)	5,678 (22.5%)
Heart failure	1,018 (2.9%)	42 (18.4%)	4,718 (18.7%)
Liver disease	454 (1.3%)	12 (5.3%)	2,189 (8.7%)
Chronic obstructive pulmonary disease	1,677 (4.8%)	36 (15.8%)	3,412 (13.5%)
Cancer	2,124 (6.1%)	60 (26.3%)	6,742 (26.7%)
HIV	11 (0.0%)	0 (0%)	127 (0.5%)
Solid organ transplant	8 (0.0%)	0 (0%)	357 (1.4%)
Alcohol abuse	642 (1.9%)	12 (5.3%)	3,356 (13.3%)
Chronic dialysis	29 (0.1%)	11 (4.8%)	2,256 (8.9%)
Orthopedic implant	3,807 (11.0%)	89 (39.0%)	5,422 (21.5%)
Cardiac or vascular implant	731 (2.1%)	18 (7.9%)	1,940 (7.7%)
Glucocorticoid (0-90 days prior)	7,062 (20.4%)	99 (43.4%)	2,911 (11.5%)
Invasive surgery (0-30 days prior)	1,962 (5.7%)	62 (27.2%)	8,451 (33.5%)

Figure 1
Age and sex stratified first-time *S. aureus* bacteremia (SAB) cases, incidence rates (IR) and comorbidity-adjusted incidence rate ratios (IRR) of SAB in patients with rheumatoid arthritis (RA) compared with the general population

* Results from Poisson regression model. Adjusted for age (as a continuous variable), calendar year (3-year intervals), diabetes mellitus, alcohol abuse, chronic dialysis, cancer, orthopedic implants, cardiac or vascular implants, chronic obstructive pulmonary disease and chronic heart failure. Follow-up time was split according to exposure status of these time-dependent covariates

SAT0062

THE COMBINED VACCINATION SCHEME AGAINST STREPTOCOCCUS PNEUMONIAE IS EFFECTIVE IN RHEUMATOID ARTHRITIS PATIENTS TREATED WITH DMARD: DATA FROM BIOBADASER 3.0

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Background: Respiratory tract infections are among the leading causes of hospitalization in rheumatoid arthritis (RA) and *Streptococcus Pneumoniae* (Sp) is one of the most frequent pathogens involved. For these patients, the CDC recommends a combined vaccination scheme (CVS) using two types of Sp vaccines but evidence on its effectiveness remains insufficient.¹

Objectives: To assess the impact of the combined vaccination scheme on the incidence of Sp infections in patients with RA treated with DMARD.

Methods: A cohort was nested in a register including patients with RA who were prescribed a bDMARD or tsDMARD -either naïve or switch- from 2000 to March 2019. The target outcomes were invasive pneumococcal disease (IPD) and all-cause community-acquired pneumonia (CAP), as defined by relevant MedDRA codes. Demographic and clinical features were also retrieved. Each participant centre informed about the date when they implemented a systematic Sp vaccination protocol and whether they were using the CVS. Those not adopting this practice were excluded from the analysis.

Crude incidence rates (IRs) were calculated for each outcome as well as for its combination (combined variable defined as "Sp infections"). Exposure was split into two periods, considering the date when the CVS was officially recommended in Spain (May 2015). The incidence rate ratio (IRR) comparing pre and post implementation periods was estimated with a Poisson regression model adjusted for sex, age and comorbidities (Charlson Index).

Results: 1704 patients were included, their characteristics are shown in table 1. One centre was excluded for not using any Sp vaccination protocol while the remaining ones reported using the CVS. Crude IRs by periods (pre and post CVS implementation) and age groups are shown in table 2. The IRR of the post-vaccination period after adjusting for age, sex and comorbidities (Charlson index) was 0.40 (95% CI: 0.29 - 0.56), $p < 0.001$.

Table 1. Baseline features of the cohort.

Demographics	
Age, years *	60.6 (12.5)
Female	1356 (79.6%)
Current smoking	287 (16.8%)
RA clinical characteristics	
Disease duration, years*	9.1 (7.9)
RF positive	875 (74%)
ACPA positive	831 (71%)
DAS28*	4.6 (1.4)
Other clinical characteristics	
Body Mass Index*	27.5 (5.2)
Charlson index*	2.3 (1.5)
Chronic pulmonary Disease	125 (9.3%)
Diabetes mellitus	147 (9%)

*Data presented as mean (standard deviation).

Table 2. Crude IRs (95% CI) of the outcomes of interest split by age.

Overall		<65		≥65	
Pre	Post	Pre	Post	Pre	Post
SP-Infections					
33 (27.4-39.9)	12.7 (9.8-16.4)	28 (22.4-35)	11.8 (8.9-15.6)	60.3 (42.4-85.8)	19.5 (10.8-35.2)
IPD					
—	0.4 (0.1-1.6)	—	0.4 (0.1-1.8)	—	—
All cause CAP					
23.6 (19.0-29.3)	11.5 (8.8-15)	18.7 (14.4-24.4)	10.4 (7.7-14)	50.8 (34.8-74)	19.5 (10.8-35.2)

Conclusion: The incidence of Sp infections experienced a decrease in RA patients taking bDMARD or tsDMARD after the introduction of the stepwise combined vaccination scheme that is not related to age, sex or comorbidities.

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[1] Furer V, et al. *Ann Rheum Dis* 2019;0:1–14

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SAT0064

VACCINATION RATE AND RISK FACTORS FOR NON-VACCINATION IN RHEUMATOID ARTHRITIS: A CROSS-SECTIONAL PROSPECTIVE MULTICENTRIC OBSERVATIONAL STUDY

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Background: Rheumatoid arthritis (RA) patients are at increased risk of infections, some of which could be prevented in part by vaccination (1). Influenza and pneumococcal vaccines are recommended in RA (2). However, vaccination coverage of these patients remains very low. Five years ago, we found in a previous study that vaccination rates in France were 55% for pneumococcal and 60% for influenza vaccines (3).

Objectives: The aim of our study was to evaluate the vaccination rate among RA patients, compare it with our previous results, and identify factors associated with non-vaccination.

Methods: We conducted a cross sectional multicentric observational study in the rheumatology departments of 5 university hospitals in France. Data were collected from December 2018 to July 2019. Outpatients and hospitalized adult patients with RA according to the ACR/EULAR 2010 criteria were included. Data were collected during a single visit through an anonymous questionnaire completed by the patients. Pearson Chi-squared analysis and multivariable logistic regression were used to compare characteristics of vaccinated versus non vaccinated patients.

Results: 584 patients (77.9% of women, mean age 61.8±12.6 years old) were included. 81.7% were RF and/or ACPA positive, with a mean RA duration of 15.7±10.5 years, 58.2% were treated with methotrexate (MTX), and 68.6% with a biologic. Vaccination rate against pneumococcal was 78.9% (versus 55% in 2013, $p < 0.0001$) and 60.4% for influenza (versus 60% in 2013). The main reason for non-vaccination was absence of vaccine proposal (59.2%) for pneumococcal, and fear of vaccines (56.7%) for influenza. In the multivariate analysis, a higher level of education (OR [CI95] 4.4 [2.3-8.4], $p < 0.0001$), a very good opinion on vaccination (2.1 [1.1-4.1], $p = 0.003$), vaccination against influenza done (2.3 [1.3-4.2], $p = 0.006$), and exposure to biologics (4.0 [2.2-7.4], $p < 0.0001$) were associated with vaccination against pneumococcal. Age over 65 years old (2.0 [1.2-3.2], $p = 0.006$), participation in a patients' association (3.6 [1.4-8.9], $p = 0.006$), vaccination against pneumococcal done (2.4 [1.3-4.5], $p = 0.004$), exposure to biologics (2.1 [1.2-3.7], $p = 0.006$), a good (3.3 [1.4-8.9], $p = 0.03$) and a very good opinion on vaccination (6.6 [2.8-15.6], $p < 0.0001$) were associated with vaccination against influenza.

Conclusion: Vaccination rate against pneumococcal increased over the last 5 years but remained stable for influenza vaccine in French RA patients. This could be improved with patient's information and education, especially in patients age under 65, biologic naïve and with a bad opinion about vaccination.

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SAT0065

TIMING OF PNEUMOCOCCAL VACCINATIONS IN RELATION TO STARTING DISEASE-MODIFYING ANTI-RHEUMATIC DRUGS IN RHEUMATOID ARTHRITIS

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