Table 1. Risk of drug failure on rheumatoid arthritis patients according to first, second, and third choice of bDMARD or tofacitinib.

	Events	Person-years	Incidence	aHR	95% CI
First-line choice (n=8,018)					
Etanercept	290	2,396	121	1.00	reference
Infliximab	236	1,417	167	1.36	1.14-1.62
Adalimumab	449	2,718	165	1.28	1.10-1.48
Golimumab	258	1,955	132	1.06	0.90-1.26
Tocilizumab	171	2,623	65	0.56	0.46-0.68
Rituximab	1	29	34	0.29	0.04-2.08
Tofacitinib	24	502	48	0.27	0.18-0.42
Abatacept	216	2,207	98	0.83	0.69-0.99
Second-line choice (n=1,645)					
Etanercept	41	151	272	1.00	reference
Infliximab	16	51	314	1.04	0.58-1.88
Adalimumab	85	275	309	1.07	0.72-1.60
Golimumab	41	204	201	0.79	0.51-1.23
Tocilizumab	85	918	93	0.38	0.25-0.55
Rituximab	4	31	129	0.52	0.18-1.46
Tofacitinib	35	484	72	0.23	0.15-0.37
Abatacept	46	299	154	0.54	0.35-0.84
Third-line choice (n=353)					
Etanercept	3	19	158	1.00	reference
Infliximab	5	10	500	1.27	0.27-5.91
Adalimumab	5	17	294	0.99	0.22-4.38
Golimumab	13	22	591	2.23	0.60-8.25
Tocilizumab	17	127	134	0.47	0.13-1.68
Rituximab	3	22	136	0.60	0.12-3.09
Tofacitinib	23	162	142	0.50	0.14-1.77
Abatacept	17	59	288	1.11	0.31-3.96

Adjusted hazard ratios calculated by multivariate Cox proportional hazards regression after adjustments for age, sex, hospital type, number of csDMARDs, first bDMARDs or tofacitinib for second and third-line choice analysis, Charlson comorbidity index, and enrollment year. Incidence calculated as the number of events per 1,000 person-years. Acronyms: aHR, adjusted hazard ratio; CI, confidence interval.

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Rheumatoid Arthritis - comorbidity and clinical aspects - Part 1

POS0210

THE INCIDENCE AND RISK FACTORS OF RHEUMATOID ARTHRITIS-ASSOCIATED INTERSTITIAL LUNG DISEASE

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Background: Rheumatoid arthritis (RA) is a systemic inflammatory disease of the joints and other organs, including the lungs.¹ Interstitial lung disease (ILD) is a lung injury pattern associated with significant symptom burden and poor outcomes in RA.² Better understanding of its risk factors could help with disease prevention and treatment.

Objectives: Using a population-based cohort, we sought to ascertain the incidence and risk factors of RA-associated ILD (RA-ILD) in recent years.

Methods: The study included adult residents of Olmsted County, Minnesota with incident RA between 1999 and 2014 based on the 1987 ACR classification criteria.³ Study subjects were followed until death, migration, or 4/30/2019. ILD was defined by the presence of bilateral interstitial fibrotic changes (excluding biapical scarring) on chest computed tomography (CT). In the absence of chest CT imaging, a physician's diagnosis of ILD in conjunction with chest X-ray findings suggestive of ILD and a restrictive pattern on pulmonary function testing (defined as a total lung capacity less than the lower limit of normal) was considered diagnostic of ILD. Evaluated risk factors included age, sex, calendar year, smoking status, body mass index (BMI) and presence/absence of rheumatoid

factor (RF) and anti-citrullinated protein antibodies (ACPA). Cumulative incidence of ILD was adjusted for the competing risk of death. Cox models were used to assess the association between potential risk factors and the development of RA-ILD.

Results: In Olmsted County, 645 residents were diagnosed with RA between 1999 and 2014. Seventy percent of patients were females, and 30% were males; median age at RA diagnosis was 55.3 [IQR 44.1-66.6] years, and most patients (89%) were white. Fifty-three percent of patients were never-smokers, and 64% had seropositive RA. Forty percent were obese (i.e., BMI ≥ 30 kg/m²); median BMI was 28.3 [IQR 24.3-33.0] kg/m².

In the cohort, ILD was identified in 73 patients. The ILD diagnosis predated RA diagnosis in 22 patients (3.4%) who were excluded from subsequent analyses. Final analyses included the remaining 623 patients with no ILD preceding, or at the time of RA diagnosis. Over a median follow-up interval of 10.2 [IQR 6.5-14.3] years, 51 patients developed ILD. Cumulative incidence of ILD, adjusted for the competing risk of death, was 4.3% at 5 years; 7.8% at 10 years; 9.4% at 15 years; and 12.3% at 20 years after RA diagnosis (Figure 1).

Age, and history of smoking at RA diagnosis correlated with the incidence of ILD; adjusted hazard ratios (HRs) were 1.89 per 10-year increase in age (95% confidence interval 1.52-2.34) and 1.94 (95% confidence interval 1.10-3.42), respectively. On the other hand, sex (HR: 1.21; 95% CI: 0.68-2.17), BMI (HR: 0.99; 95% CI: 0.95-1.04), obesity (HR: 0.89; 95% CI: 0.50-1.58), and seropositivity (HR: 1.15; 95% CI: 0.65-2.03) did not demonstrate significant associations with ILD.

Conclusion: This study provides a contemporary estimate of the occurrence of ILD in a well-characterized population-based cohort of patients with RA. Our findings of a lack of association between sex, obesity and seropositivity with ILD may indicate a change in established risk factors for ILD and warrant further investigation.

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Figure 1. Cumulative incidence of ILD in patients diagnosed with RA between 1999 and 2014, adjusted for the competing risk of death. **Abbreviations.** ILD: interstitial lung disease; RA: rheumatoid arthritis.

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