Table 1. Logistic regression of risk for R-TKA

Variable (reference)	Level	Odds ratio	95% CI	p-value
Age	--	0.95	0.94-0.95	<.001
Sex (female)	Male	1.07	0.99-1.15	0.108
Race (white)	Asian	0.65	0.42-0.96	0.031
	Black	1.42	1.26-1.6	<.001
	Unknown	0.81	0.64-1.02	0.07
	Other	1.05	0.92-1.21	0.446
Insurance (Medicare)	Medicaid	0.89	0.75-1.06	0.193
	Other	0.89	0.71-1.13	0.331
	Private	0.82	0.74-0.91	<.001
	Work compensation	1.56	1.35-1.8	<.001
Surgeon volume (>=146)	<=12	1.5	1.25-1.8	<.001
	13-59	1.16	1.04-1.29	0.006
	60-145	1.0	0.91-1.11	0.957
Hospital volume (>=645)	<= 89	0.98	0.84-1.15	0.848
	90-235	0.99	0.88-1.12	0.869
	236-644	0.88	0.79-0.98	0.018
Hospital bed size (>400 beds)	6-199	1.13	1.02-1.25	0.024
	200-399	1.06	0.96-1.17	0.262

Other variables in model: diabetes, obesity, renal disease, COPD, osteoarthritis, osteonecrosis, dislocation, inflammatory arthritis, surgical complication, infection, no college, poverty >20%, years since residency, US/Canada medical school, orthopedic board certified, AHA control, teaching, rural hospital

Figure 1. Odds and odds ratio of aseptic revision TKA for black and white patients by hospital and surgeon volume category

*Odds are multiplied by 100 for easier visualization

Disclosure of Interests: Serene Mirza: None declared, Susan Goodman: None declared, Yi Zhang: None declared, Huong Do: None declared, Bella Mehta: None declared, Stephen Lyman: None declared, Lisa A. Mandl: None declared, Mark Figgie: None declared, Michael Parks Consultant of: Zimmer biomet, Grant/ research support from: Zimmer biomet, Linda Russell: None declared, Anne Bass: None declared

DOI: 10.1136/annrheumdis-2021-eular.664

Oncorheumatology

POS0286

INCIDENCE OF MALIGNANCIES IN JAPANESE PATIENTS WITH RHEUMATOID ARTHRITIS: DATA FROM A LARGE JAPANESE NATIONAL REGISTRY

T. Matsui¹, N. Sugiyama², S. Toyoizumi³, F. Matsuyama⁴, T. Murata⁴, Y. Urata⁵, K. Kawahata⁶, S. Tohma⁷. ¹National Hospital Organization Sagami-hara National Hospital, Department of Rheumatology, Clinical Research Center for Allergy and Rheumatology, Kanagawa, Japan; ²Pfizer Japan Inc, Inflammation and Immunology, Tokyo, Japan; ³Pfizer R&D Japan, Biometrics and Data Management, Tokyo, Japan; ⁴CRECON Medical Assessment Inc, Tokyo, Japan; ⁵Tsugaru General Hospital, Department of Rheumatology, Aomori, Japan; ⁶St. Marianna University School of Medicine, Division of Rheumatology and Allergology, Department of Internal Medicine, Kanagawa, Japan; ⁷National Hospital Organization Tokyo National Hospital, Department of Rheumatology, Tokyo, Japan

Background: Patients (pts) with rheumatoid arthritis (RA) have an increased risk of some malignancies vs the general population, and this can vary by region/race.^{1,2} Data on the epidemiology and impact of biological (b)DMARDs and targeted synthetic (ts)DMARDs, such as Janus kinase (JAK) inhibitors, on the incidence of malignancies in Japanese pts with RA are limited. The National

Database of Rheumatic Diseases in Japan (NinJa) is one of the largest RA registries in Japan.

Objectives: To evaluate the incidence of malignancies in Japanese pts with RA using NinJa registry data.

Methods: This retrospective observational study analysed NinJa registry data for Japanese pts with RA aged ≥18 years with ≥1 data entry between 2013 (first JAK inhibitor approval for RA in Japan) and 2018. The overall cohort included all pts with RA, and two sub-cohorts were analysed: pts exposed and unexposed to bDMARDs (exposure defined as ≥1 bDMARD reported in database). Crude incidence rates (IRs) for malignancies (including non-melanoma skin cancer) were calculated as the number of events per 100 pt-years of follow-up (time between start of follow-up or the date of first bDMARD exposure [for bDMARD-exposed pts] and end of observation period, or withdrawal from database). The most recent data for incidence of malignancy in the Japanese general population (2013–2017 data from the National Cancer Center, Japan) were used to calculate standardised incidence ratios (SIRs) and age- and sex-adjusted standardised rates (ASRs) for malignancies. Cross-sectional (per calendar year) and cumulative analyses were performed for the overall cohort. Cumulative rates were calculated for sub-cohorts, and all cumulative analyses were repeated excluding pts exposed to JAK inhibitors (ie ≥1 JAK inhibitor reported in database).

Results: Data were collected for 26 607 Japanese pts with RA from 2013–2018. In the cross-sectional analysis (Table 1), the SIR and ASR for malignancies in all pts with RA were generally consistent from 2013–2018. In the cumulative analysis, the SIR (95% CI) for malignancies from 2013–2018 was 0.97 (0.91, 1.03) in all pts with RA, and 0.93 (0.82, 1.04) and 0.99 (0.92, 1.07) in pts exposed and unexposed to bDMARDs, respectively (Figure 1). Adjusting for age/sex, the cumulative ASR (95% CI) for malignancies from 2013–2018 was 0.83 (0.76, 0.90) in all pts with RA, and 0.82 (0.69, 0.95) and 0.86 (0.77, 0.96) in pts exposed and unexposed to bDMARDs, respectively (Figure 1). In all cohorts, the cumulative SIR and ASR were similar when pts exposed to JAK inhibitors were excluded (Figure 1).

Table 1. Cross-sectional analysis of the incidence of malignancies in Japanese pts with RA from 2013–2018

	All RA					
	2013 (N=13 423)	2014 (N=15 584)	2015 (N=15 751)	2016 (N=16 107)	2017 (N=15 994)	2018 (N=15 003)
Total follow-up, PY	13 353	14 866	14 829	14 970	14 748	14 898
Pts with events, n	140	164	174	168	161	211
Crude IR ^a	1.05	1.10	1.17	1.12	1.09	1.42
(95% CI)	(0.89, 1.24)	(0.95, 1.29)	(1.01, 1.36)	(0.97, 1.31)	(0.94, 1.27)	(1.24, 1.62)
ASR ^{a,b}	0.76	0.76	0.90	0.88	0.80	0.88
(95% CI)	(0.60, 0.93)	(0.62, 0.90)	(0.68, 1.11)	(0.68, 1.07)	(0.62, 0.98)	(0.74, 1.01)
SIR ^b	0.97	1.01	1.02	0.88	0.86	1.10
(95% CI)	(0.82, 1.14)	(0.86, 1.17)	(0.87, 1.18)	(0.75, 1.02)	(0.73, 1.00)	(0.95, 1.25)

^aIR/ASR were calculated as number of events per 100 PY of follow-up^bData from a Japanese general population database of malignancy incidence from 2013–2017, provided by the Center for Cancer Control and Information Services, National Cancer Center, JapanPY, pt-years

Conclusion: The incidence of malignancies in Japanese pts with RA, registered in the NinJa database from 2013–2018, was similar to that in the Japanese general population. The SIR and ASR for malignancies were comparable in pts exposed and unexposed to bDMARDs. In all cohorts, rates did not increase when pts exposed to JAK inhibitors were included.

Figure. Cumulative analysis of the incidence of malignancies in Japanese pts with RA from 2013–2018

^aIR/ASR were calculated as the number of events per 100 PY of follow-up

^bData from a Japanese general population database of malignancy incidence from 2013–2017, provided by the Center for Cancer Control and Information Services, National Cancer Center, JapanPY, pt-years

REFERENCES:

- [1] Dougados et al. Ann Rheum Dis 2014; 73: 62-68.

[2] Parikh-Patel et al. Cancer Causes Control 2009; 20: 1001-1010.

Acknowledgements: Study sponsored by Pfizer Inc. Medical writing support was provided by Christina Viegelmann, CMC Connect, and funded by Pfizer Inc.

Disclosure of Interests: Toshihiro Matsui Speakers bureau: Astellas, Ayumi, Chugai, Daiichi-Sankyo, Eli Lilly, Ono, Pfizer Inc, Takeda, Tanabe-Mitsubishi, Consultant of: Pfizer Inc, Grant/research support from: Chugai, Naonobu Sugiyama Shareholder of: Pfizer Inc, Employee of: Pfizer Inc, Shigeyuki Toyozumi Employee of: Pfizer R&D Japan, Fujio Matsuyama Consultant of: Pfizer Inc, Employee of: CRECON Medical Assessment Inc, Tatsunori Murata Consultant of: Pfizer Inc, Employee of: CRECON Medical Assessment Inc, Yukitomo Urata Speakers bureau: Asahi Kasei, Chugai, Eli Lilly, Pfizer Inc, Consultant of: AbbVie, Asahi Kasei, Chugai, Pfizer Inc, Kimito Kawahata Speakers bureau: Pfizer Inc, Consultant of: Pfizer Inc, Grant/research support from: Pfizer Inc, Shigeto Tohma Speakers bureau: Astellas, Ayumi, Chugai, Ono, Pfizer Inc, Takeda, Consultant of: Pfizer Inc
DOI: 10.1136/annrheumdis-2021-eular.365

POS0287

USE OF BIOLOGIC DISEASE MODIFYING ANTI-RHEUMATIC DRUGS IN RELATION TO THE RISK OF LYMPHOMA: A COHORT STUDY OF US VETERANS WITH RHEUMATOID ARTHRITIS

N. Singh¹, A. Peterson², A. Baraff², A. Korpak², M. Vaughan-Sarrazin³, N. Smith², J. Curtis⁴, N. Weiss⁵. ¹1959 NE Pacific St, Internal Medicine, Seattle, United States of America; ²1660 S Columbian Way, Epidemiologic Research and Information Center, Seattle, United States of America; ³UI Hospitals and Clinics, 200 Hawkins Dr, Internal Medicine, Iowa City, United States of America; ⁴University of Alabama at Birmingham, Internal Medicine, Birmingham, United States of America; ⁵University of Washington School of Public Health, Epidemiology, Seattle, United States of America

Background: Epidemiologic studies suggest that disease duration and degree of inflammatory activity of rheumatoid arthritis (RA) contribute to lymphoma development. However, the association of the use of biologic disease modifying anti-rheumatic drugs (bDMARDs) in patients with RA on lymphoma risk needs further evaluation.

Objectives: Examine the effect of administration of bDMARDs on the incidence of lymphoma in an inception cohort of RA.

Methods: We identified patients diagnosed with RA in any US Veterans Affairs (VA) facility from 1/1/2002 and 12/31/2018 using the Veteran's Health Administration (VHA) databases. To be included, each patient was required to meet the following criteria: 1) 2+ RA diagnostic codes at least 7 days apart but no more than 365 days apart 2) a prescription for a conventional synthetic DMARD (csDMARD) within 90 days of the first RA diagnosis 3) One inpatient or outpatient visit 30 days to 2 years preceding first RA diagnosis (indicating they are a regular user of the VHA). We excluded patients for any of the following if they preceded the first RA diagnosis: 1) a prior single RA diagnostic code 2) a prescription for any DMARD medication 3) a concomitant diagnosis of another inflammatory arthritis (e.g. psoriatic arthropathy) 4) a diagnosis of lymphoma. Index date for the study is the date of the first qualifying RA diagnosis. Lymphoma diagnoses were identified through VHA records using the International Classification of Diseases-Oncology codes.

Results: We identified 27,536 veterans with RA in the study period meeting the inclusion and exclusion criteria. Of these, 53% (n=14,705) were in the age range 60 to 80 years. The cohort was 89% male, 75.5% White, 13.7% African American. Over the study period, 1.2% (n=332) of the study population developed a lymphoma.

Conclusion: Using the nationwide VHA we have identified a large inception cohort of patients with RA of whom 1.2% developed lymphoma over study follow-up. This data will be used in future analyses to produce estimates of the effect of biologic medications on lymphoma risk, adjusting for confounding by indication and other variables.

Table 1. Baseline characteristics of the cohort based on bDMARD exposure status

Characteristic	bDMARD-naïve (n= 19,095)	bDMARD- exposed (n=8,441)
Overall Lymphomas		
Age (years)	171	161
18-40	4	6
40-60	63	78
60-80	100	74
>80	4	3
Males	17,206 (90%)	7,270 (86%)
Race		
White	14,150 (74%)	6,627 (76%)
Black	2,674 (14%)	1,090 (13%)
Asian	96 (0.5%)	46 (0.5%)
Native American or Pacific Islander	371 (2.2%)	187 (2.2%)
Missing	1,804 (9%)	491 (6%)

Acknowledgements: The work in this abstract is supported by Investigator Award from the Rheumatology Research Foundation to Dr Singh.

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2021-eular.3395

POS0288

A KEY TIF1 γ EPITOPE MAY FACILITATE THE IDENTIFICATION OF PATIENTS AT HIGHEST RISK OF CANCER ASSOCIATED MYOSITIS

V. Riddell¹, F. Mcmorrow², A. Oldroyd³, C. Deakin⁴, J. Lamb³, H. Chinoy^{3,5}, L. Wedderburn^{4,6}, S. Bagby¹, N. Mchugh², S. Tansley^{2,7}. ¹University of Bath, Biology and Biochemistry, Bath, United Kingdom; ²University of Bath, Pharmacy and Pharmacology, Bath, United Kingdom; ³University of Manchester, NIHR Manchester Musculoskeletal Biomedical Research Centre, Manchester, United Kingdom; ⁴University College London, GOS Institute of Child Health, London, United Kingdom; ⁵Salford Royal NHS Foundation Trust, Rheumatology, Manchester, United Kingdom; ⁶Great Ormond Street Hospital, Rheumatology, London, United Kingdom; ⁷Royal United Hospitals Bath NHS Foundation Trust, Rheumatology, Bath, United Kingdom

Background: The myositis specific autoantibody anti-TIF1 γ targets TRIM33, a TRIM family protein with a PHDBromo domain at the C terminal end. Anti-TIF1 γ is strongly associated with malignancy in adult patients with idiopathic inflammatory myopathies (IIM). Intriguingly, anti-TIF1 γ is also the most common autoantibody in juvenile-onset IIM but younger patients with anti-TIF1 γ do not have an increased risk of cancer (1-3). Genetic studies have consistently shown human leukocyte antigen (HLA) to be the strongest risk factor for IIM. Adult and juvenile-onset patients with anti-TIF1 γ have recently been shown to have different associations at the HLA-DQB1 locus (4). This could be due to differences in the key TIF1 γ epitopes and may relate to differences in aetiology, such as malignancy in adults versus other environmental factors in juvenile onset disease.

Objectives: To identify key epitopes targeted by anti-TIF1 γ antibody in patients with IIM and establish if different TIF1 γ epitopes are targeted in patients with and without malignancy.

Methods: Patient plasma/serum samples were obtained from UK Juvenile Dermatomyositis Cohort and Biomarker and UKMyoNet studies. Autoantibody status had previously been determined by immunoprecipitation. Cancer data was collated from the UK Health and Social Care Information Centre and cancer associated IIM (CAM) defined as that occurring within 3 years of IIM diagnosis. An in house ELISA was developed using a purified TIF1 γ fragment comprising residues 882-1090, produced in *E.coli*, corresponding to the PHDBromo protein domain. An ELISA cut-off of 5SD above the mean of 38 healthy control samples was used.

Results: 38 healthy controls, and 117 anti-TIF1 γ IIM patient sera (60 juvenile onset) were analysed for reactivity to the TIF1 γ PHDBromo domain.

No healthy controls were positive. Anti-TIF1 γ PHDBromo was more common in JDM: 18 (30%) juvenile patients and 6 (10.5%) adult patients were positive, p=0.01. Additional data was available for 39 adult patients (82% female, median age 52 (IQR 38-64)). Anti-TIF1 γ PHDBromo was only found in CAM patients plus one young adult non-CAM patient aged 27 years at disease onset, p=0.07 (p=0.02 for patients >30 years at disease onset), see Table 1. No juvenile patients had a history of malignancy.

Table 1. Anti-TIF1 γ PHDBromo in 39 adult patients with cancer data available

	anti-TIF1 γ PHDBromo positive	anti-TIF1 γ PHD- bromo negative
Cancer associated myositis n(%)	5 ^a (83)	12(36)
Myositis not associated with cancer n(%)	1 ^b (17)	21(64)
Total	6	33

a. Median age 64 yearsb. Age 27 years

Conclusion: The TIF1 γ PHDBromo domain is an important epitope and autoantibody reactivity is more common in patients with juvenile-onset disease and adults with CAM. The distinction between adult and juvenile-onset IIM is arbitrary and it is relevant that the only adult with anti-TIF1 γ PHDBromo not to have malignancy was just 27 years old. Our numbers are small and further work is needed to establish if anti-TIF1 γ PHDBromo, and indeed other TIF1 γ epitopes, could help identify patients at highest risk of malignancy, and how this relates to our understanding of IIM aetio-pathogenesis. Our findings may add weight to the theory that the development of IIM in younger patients occurs after immune-mediated resolution of a pre-cancer event.

REFERENCES:

- Oldroyd A, Sergeant JC, New P et al. The temporal relationship between cancer and adult onset anti-transcriptional intermediary factor 1 antibody-positive dermatomyositis. Rheumatology. 2019;58(4):650-655
- Tansley SL, Simou S, Shaddick G et al. Autoantibodies in juvenile-onset myositis: Their diagnostic value and associated clinical phenotype in a large UK cohort. J Autoimmun. 2017;84:55-64