Table 2. Related factors for malignancies in patients with IgG4-RD

Variables	Univariate analysis		Multivariate analysis	
	Univariate OR (95%CI)	P-value	Multivariate OR (95%CI)	P-value
Head and Neck involvement	0.304 (0.097-0.952)	0.041	0.604 (0.152-2.401)	0.474
Autoimmune pancreatitis	5.359 (1.651-17.393)	0.005	6.230 (1.559-24.907)	0.010
Eosinophilia	0.117 (0.014-0.966)	0.046	0.094 (0.010-0.883)	0.039

Figure 1. Standardized incidence ratios of malignancies in patients with IgG4-RD from different studies.

Methods: We prospectively analyzed the IgG4-RD patients recruited in Peking Union Medical College Hospital from January 2011 to August 2018 and identified patients diagnosed with IgG4-RD complicating malignancies. Data regarding demographics, clinical features, treatment and prognosis of IgG4-RD patients complicating malignancies were collected and compared to those of age- and sex-matched controls.

Results: Among the 587 Chinese patients with IgG4-RD, 17 malignancies were identified. Ten of them developed malignancy after the diagnosis of IgG4-RD, given a standard incidence ratio (SIR) of 2.78 (95%CI 1.33-5.12). Multivariate logistic analysis indicated that autoimmune pancreatitis (OR= 6.230, 95%CI 1.559-24.907, $p=0.010$) was positively associated with malignancy, whereas eosinophilia (OR= 0.094, 95%CI 0.010-0.883, $p=0.039$) was negatively related with malignancies. During a median follow-up period of 61.4 ± 26.4 months, all patients with IgG4-RD and malignancies survived.

Conclusion: An increased incidence of malignancy was found in Chinese IgG4-RD cohort. Autoimmune pancreatitis is a potential risk factor, whereas eosinophilia is a possible protective factor for complicating malignancies.

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FRI0509

COMPARISON OF MS SCORE AND HSCORE FOR THE DIAGNOSIS OF ADULT-ONSET STILL'S DISEASE ASSOCIATED MACROPHAGE ACTIVATION SYNDROME

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Background: Adult-onset Still's disease (AOSD) is a rare multisystemic auto-inflammatory disease. Macrophage activation syndrome (MAS) is a life-threatening complication of rheumatic disorders, including sJIA, adult-onset Still's disease (AOSD) and lupus. Many tools have been developed for the diagnosis of MAS, including HScore and MS score. Although some authors have tried to apply these tools for the diagnosis of AOSD-associated MAS, there are no studies comparing the diagnostic ability of HScore and MS score.

Objectives: We aimed to compare the capacity of HS score and MS score for the diagnosis of AOSD-associated MAS.

Methods: Patients diagnosed as AOSD during January, 2012 and October, 2019 in our hospital were retrospectively analyzed. Clinical and laboratory data were compared between patients with pure AOSD and those with AOSD associated MAS. HScore and MS score were calculated respectively and the diagnostic capacity of MAS was compared by means of receiver operating characteristic (ROC) curve analysis.

Results: We included 174 patients with pure AOSD and 35 patients with AOSD-associated MAS. Patients with AOSD-associated MAS were younger than those with pure AOSD (32 ± 11.4 yrs vs 36.9 ± 13.5 yrs, $P=0.028$). More death were observed among patients with AOSD-associated MAS (17.1% vs 3.4%, $P=0.001$). Patients with AOSD-associated MAS had higher HScore (median [range] 196 [98-333] vs 68 [33-156], $P<0.001$) and higher MS score (median [range] 1.05 [-1.26-26.55] vs -1.17 [-1.26-2.52], $P<0.001$) than those with pure AOSD. The difference of different parameters of these two groups of patients

Figure 1. ROC curve of HScore and MS score. HScore=120, sensitivity=90.6%, specificity=89.6%. MS score=-0.45, sensitivity=75%, specificity=73%. AUC-HScore=0.973, AUC-MS score=0.865, $P<0.001$

were detailed in Table 1 and Table 2. ROC curve analysis (Figure 1) revealed that HScore has stronger ability to diagnose AOSD-associated MAS compared with MS score (AUC=0.973 and 0.865 for HScore and MS score respectively, $P<0.001$). HScore ≥ 120 perform best (sensitivity 90.6% and specificity 89.6%). MS score ≥ -0.25 yielded a sensitivity of 75% and a specificity of 73%.

Conclusion: HScore seems to perform much better than MS score for the diagnosis of AOSD-associated MAS in our cohort.

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Public health, health services research, and health economics

FRI0510

THE FREQUENCY OF CONTRACEPTION DOCUMENTATION IN WOMEN ON AND OFF TERATOGENIC ANTI-RHEUMATIC MEDICATIONS IN THE RISE REGISTRY

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Background: Several of the most commonly prescribed medications for women with rheumatic disease are teratogens, posing a risk for pregnancy loss and birth defects if taken in pregnancy. To prevent these life-altering complications, it is important that all women taking teratogenic medications avoid pregnancy through abstinence or contraception.

Objectives: We sought to understand the accessibility to contraceptive data within the RISE Registry and to test whether, compared to other women,

those prescribed a teratogen would be more likely to have documentation of contraceptive.

Methods: Data were derived from Rheumatology Informatics System for Effectiveness (RISE), a national EHR-enabled rheumatology registry that passively collects data on all patients seen by participating practices. As of 2018, RISE held validated data from 1,113 clinicians in 226 practices, representing an estimated 32% of the U.S. clinical rheumatology workforce. Female patients between the ages 18-45 with an anti-rheumatic medication prescribed within the RISE system in 2018 were stratified into one of 3 groups: 1) Any teratogen (methotrexate, mycophenolate, mycophenolic acid, cyclophosphamide, leflunomide, thalidomide, lenalidomide); 2) Only pregnancy-compatible medications (hydroxychloroquine, azathioprine, or a TNF- α inhibitors [TNFi]); and 3) Any medication with unknown teratogenicity (non-TNF biologics and new small molecule medications). We identified the most recent contraceptive medication or device reported in 2018 using structured fields in the EHR. Contraceptive effectiveness was classified as 'highly effective' (IUD, Nexplanon, and surgical) and 'effective' (oral contraceptives, depo-provera, patch, ring), and unknown (type not reported). Statistical significance was assessed using Stata SE 15.1.

Results: In 2018, 110,359 women between the ages of 18-45 were prescribed an anti-rheumatic medication within the RISE Registry. Of these, 11,569 (10.5%) had a contraceptive documented at the last visit. The frequency of contraception documentation varied between practices, ranging from 0% to 28.7% (median 9.2%). Contraception was documented slightly less often in women receiving teratogens (9.8%) compared to women receiving only pregnancy-compatible medications (10.4%, $p=0.04$) and medications with unknown pregnancy risks (10.0%, $p=0.67$). The frequency of contraceptive documentation in women prescribed a teratogen varied significantly by race with white women having the highest rate (11.0%) compared to African-American women (7.4%, $p<0.001$), Hispanic women (5.5%, $p<0.001$), and Asian women (8.4%, $p=0.08$). The type of contraceptive documented did not vary significantly between medication group. Highly effective contraception was rarely documented (1.4-1.6%) and moderately-effective hormonal contraceptives were more frequently documented (6.3-8.2%).

Conclusion: This study is limited to the analysis of structured fields within the RISE Registry, thereby missing contraceptive documentation within the clinician notes. Increased uniformity in documentation and/or analysis of visit notes will be essential to use the RISE Registry to study the implementation of published contraceptive guidelines. While the documentation of contraception identified in this analysis of the RISE Registry likely under-estimates actual contraceptive use, it reveals important gaps in care. Contrary to what was expected, women prescribed a teratogen were not more likely than other women to have a documented contraceptive. Additionally, important racial disparities in contraception documentation suggest that rheumatologists may not addressing reproductive health needs equally across patient populations.

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FRI0511

THE DESCRIPTIVE EPIDEMIOLOGY AND SECULAR TRENDS OF LOWER BACK PAIN PROCEDURES IN ROUTINE UK NHS CARE FROM 2000 TO 2016

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Background: The lifetime prevalence of lower back pain is between 60% and 70%, with surgical treatments spared for those not responding to other options.

Objectives: To investigate the age, gender and socio-economic status differences in back pain procedures in the UK between 2000, 2008 and 2016.

Methods: Data was obtained from primary care electronic medical records (CPRD GOLD) linked to English hospital admissions data. Lower back procedures in patients aged 35+ were identified using OPCS-4 codes for Decompression (Dc), Fusion (F), Therapeutic injections (TI) and Denervation (Dn). Standardised incidence rates (IR) of each type of lower back procedures were calculated per 10,000 CPRD registered person years for each age group, gender, region and SES strata in 2000, 2008 and 2016. IR were also calculated for combinations of

Table 1. Event numbers and incidence rates of different types of lower back procedure.

	Fusion		Decompression		Therapeutic Injection		Denervation	
	Events	IR (95% CI)	Events	IR (95% CI)	Events	IR (95% CI)	Events	IR (95% CI)
2000	109	0.86 (0.71, 1.04)	466	3.69 (3.36, 4.04)	2035	16.11 (15.42, 16.82)	91	0.72 (0.58, 0.88)
2008	333	1.77 (1.58, 1.97)	1197	6.35 (6.00, 6.72)	6283	33.35 (32.53, 34.18)	596	3.16 (2.91, 3.43)
2016	159	1.93 (1.65, 2.26)	525	6.39 (5.85, 6.96)	3865	47.03 (45.56, 48.54)	487	5.93 (5.41, 6.48)

Figure 1. Age and Gender stratified incidence rate ratios of all back procedures in 2000, 2008 and 2016

Figure 2. Deprivation status incidence rate ratios by year

age and gender. Negative binomial regression calculated incidence rate ratios (IRR) and 95% confidence intervals.

Results: The IR of lower back procedures was 21.5 [20.7, 22.3] per 10,000 person years in 2000. This doubled by 2008 (45.5 [44.5, 46.5]) and trebled by 2016 (62.5 [60.8, 64.2]). Number of events and incidence rates of each procedure type are shown in table 1 below. The incidence of Dn has increased 6-fold whilst Dc and F have doubled. Female (IR in 2016 of 73.99 [71.43, 76.61] vs 50.08 [47.90, 52.33] in men, IRR 1.50 [1.41, 1.59]) and age are associated with back procedure rates (figure 1). Large socio-economic differences were observed, with higher procedure rates seen in the most deprived areas. These differences did however narrow over time during the study period (figure 2).