THU0667

OVERALL INFECTION RISK IN PATIENTS WITH RHEUMATOID ARTHRITIS RECEIVING ABATACEPT, RITUXIMAB AND TOCILIZUMAB. AN OBSERVATIONAL COHORT STUDY

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Background: Most infections in patients with rheumatoid arthritis (RA) are treated in primary care with a prescription of antibiotics. Only a small fraction requires hospitalization. Existing studies of infection risk in patients with RA, who receive non-tumor-necrosis-factor-inhibitor biologic (non-TNFi) therapy, however, have focused primarily on hospitalized infections.⁽¹⁾

Objectives: In Danish RA patients treated in routine care with the three non-TNFi abatacept, rituximab and tocilizumab 1) to compare adjusted incidence rates (IR) of infections overall, and 2) to estimate the relative risk (RR) of infections across the drugs during the first year of non-TNFi treatment.

Methods: We conducted an observational cohort study including all RA patients in DANBIO who started a non-TNFi treatment between January 2010 and December 2017. Clinical characteristics at baseline were described. We defined infections as either a prescription of antibiotics or a hospitalization due to infection. Baseline comorbidities, antibiotic prescriptions and hospitalized infections were identified through linkage to national registries. We calculated IRs of infections per 100 person-years (age and gender adjusted) and rate ratios (as estimates of RRs, adjusted for additional covariates) during the first year of treatment (Poisson regression).

Results: We identified 3,696 treatment series of non-TNFi (abatacept 1,115/rituximab 1,017/tocilizumab 1,564). Patients receiving rituximab tended to be older, had longer disease duration and more previous malignancies. During the first year of treatment, 1,747 infections were identified. Age and gender adjusted IRs per 100 person years were (abatacept/rituximab/tocilizumab): 76.1(69.3; 83.6)/87.3(79.3; 96.1)/77.4(71.4; 83.9). Adjusted RRs (Table) were 0.88(0.76; 1.02) for abatacept and 0.87 (0.75; 1.00) for tocilizumab compared to rituximab. For abatacept vs. tocilizumab it was 1.02 (0.89; 1.16).

Table. Baseline characteristics, one-year IRs and RRs of infections in RA patients starting non-TNFi treatment stratified by drug.

Variable	Abatacept, N=1115	Rituximab, N=1017	Tocilizumab, N=1564
Female gender, %	78 %	78 %	78 %
Age, years	59 (50-68)	62 (53-70)	59 (50-67)
Disease duration, years	8 (3-16)	11 (5-19)	9 (3-16)
DAS28	4.7 (3.9-5.4)	4.8 (4.0-5.9)	4.9 (4.1-5.7)
CRP, mg/L	8 (3-20)	10 (4-22)	12 (4-30)
HAQ	1.4 (0.9-1.9)	1.5 (1.0-2.0)	1.4 (1.0-2.0)
Previous cancer, %	1 %	9 %	2 %
Previous infection*, %	24 %	28 %	24 %
Incidence rates (IR) of infections, 0-12 months			
Person years	631	520	888
Infections, n	512	500	735
IR/100 PY (95%CI)*	76.1 (69.3; 83.6)	87.3 (79.3; 96.1)	77.4 (71.4; 83.9)
Risk ratios (RR) for infections, 0-12 months			
	ABA vs TCZ (ref)	ABA vs RTX (ref)	TCZ vs RTX (ref)
Adjusted RR (95%CI)**	1.02 (0.89; 1.16)	0.88 (0.76; 1.02)	0.87 (0.75; 1.00)

Numbers are median (IQR) unless otherwise stated. *previous hospitalized infection **adjusted for age and sex. ** Adjusted for age, sex, DAS28, smoking, disease duration, HAQ, glucocorticoids use at baseline, previous hospitalized infection, previous cancer, previous chronic obstructive pulmonary disease. Abbreviations: CI: confidence interval; DAS28: disease activity score of 28 joints, HAQ: health assessment questionnaire, PY: person years

Conclusion: In patients with RA receiving treatment with abatacept, rituximab or tocilizumab in routine care, rituximab had the highest risk of infection during first year of treatment. However, this finding should be interpreted with caution due to differences in baseline characteristics across drugs and potential residual confounding.

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THE ASSOCIATION BETWEEN ANTI-CCP TITRE LEVEL AND DISEASEACTIVITY AND DISABILITY OVER ONE YEAR FOLLOWING THE INITIATION OF METHOTREXATE OR BIOLOGIC THERAPY FOR ANTI-CCP+ RHEUMATOID ARTHRITIS

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Background: Whilst anti-cyclic citrullinated peptide antibody (anti-CCP) positivity is associated with poor outcomes in patients with rheumatoid arthritis (RA), it is unclear whether titre level over time is associated with outcome.

Objectives: Whilst anti-cyclic citrullinated peptide antibody (anti-CCP) positivity in associated with poor outcomes in patients with rheumatoid arthritis (RA), it is unclear whether titre level over time is associated with outcome.

Methods: Patients were recruited to one of two, UK-based, multi-centre prospective cohort studies: MTX-starters = Rheumatoid Arthritis Medication Study (RAMS); biologic-starters = Biologics in Rheumatoid Arthritis Genetics and Genomics Study Syndicate (BRAGGSS). Anti-CCP titre (Axis-Shield Anti-CCP test; U/ml; anti-CCP titre >5 U/ml = anti-CCP+) was measured at the co-ordinating centre from blood samples taken at baseline, 6 months and 12 months. Patients who were anti-CCP+ at baseline and had titre measured at one other assessment were included in the analysis. Patients completed the Health Assessment Questionnaire (HAQ) and the Disease Activity Score (DAS28) was calculated at each assessment. The association between anti-CCP titre and DAS28 and HAQ was assessed using linear random effects models, controlling for age, gender and disease duration (months). Anti-CCP titre was natural log-transformed. Missing data resulting from anti-CCP assay failure were imputed using multiple imputation.

Results: In total, 686 MTX-starters and 346 biologic-starters were included. Biologic-starters had worse disease at baseline compared to MTX-starter (Table). Median [IQR] titre decreased slightly over follow-up for MTX-starters (baseline = 147 [48, 416]; 6 months = 133 [47, 454]; 12 months = 124 [44, 421]; p=0.63) and biologic-starters (baseline = 138 [37, 492]; 6 months = 112 [30, 468]; 12 months = 103 [30, 451]; p=0.36) but this was non-significant. For MTX-starters, anti-CCP titre was statistically significantly associated with DAS28 and HAQ, but the effect sizes were small (mean difference [95% CI] per unit increase in log anti-CCP: DAS28 = 0.07 [0.02, 0.11]; HAQ = 0.06 [0.03, 0.08]). There was no significant association between anti-CCP titre and DAS28 and HAQ for biologic-starters (mean difference [95% CI] per unit increase in log anti-CCP: DAS28 = 0.03 [-0.05, 0.10]; HAQ = 0.02 [-0.01, 0.05]).

Conclusion: Time-varying anti-CCP titre level was not strongly associated with disease activity or disability over one year in either MTX-starters or biologic-starters who were anti-CCP+ at baseline, indicating repeat testing of anti-CCP level may not be necessary.

Baseline characteristics

Baseline characteristics	MTX-Starters	Biologic-starters
N	686	346
Age, years	59 (49, 67)	59 (51, 67)
Female, N (%)	441 (64.3)	269 (77.8)
Disease duration, months	9 (4, 27)	72 (24, 180)
Smoking:		
Never	240 (35.5)	106 (30.6)
Former	265 (39.1)	163 (47.1)
Current	172 (25.4)	77 (22.3)
Swollen joint count (28)	5 (2, 10)	8 (5, 11)
Tender joint count (28)	5 (2, 11)	13 (9, 18)
CRP, mg/l	7 (3, 19)	10 (5, 26)
DAS28-CRP	4.2 (3.3, 5.2)	5.6 (5.2, 6.2)
HAQ	1.13 (0.50, 1.63)	1.63 (1.13, 2.00)
Pain VAS, mm	50 (26, 73)	69 (52, 78)
Fatigue VAS, mm	51 (24, 72)	71 (52, 85)
Anti-CCP+, N (%)	686 (100)	346 (100)
Anti-CCP titre	147 (48, 416)	138 (37, 492)

Anti-CCP = anti-cyclic citrullinated peptide antibody, CRP = C-reactive protein, DAS28 = Disease Activity Score (28), HAQ = Health Assessment Questionnaire, MTX = methotrexate, N = number, VAS = visual analogue scale

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THU0669 GESTATIONAL AGE AT BIRTH AND THE RISK OF AUTOIMMUNE DISEASE

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Background: A preterm newborn has an immature immune system. Although preterm birth is associated with autoimmune hypothyroidism, it is unclear, whether it also could lead to an overall increased risk of autoimmune disease.

Objective: We assessed whether a shorter gestation increases the risk of special reimbursement for medication for hypothyroidism, rheumatic disease, or ulcerative colitis/Crohn's disease

Design/Methods: A total of 235 622 children were born in Finland from Jan 1987 to Sep 1990, according to the Medical birth register, which provided also gestational age (GA) at birth. Data were linked by help of the personal identity number. A register held by the Social Insurance Institution provided the data on special reimbursements. We calculated cumulative incidences within gestational age groups until December 2014 and tested statistical significance by the chi-squared –test.

Results: At the end of the follow-up, 1354 men and 2200 women had at least one of the specified autoimmune diseases.

The cumulative incidences differed by gestational age only regarding a 50% higher incidence for hypothyroidism among all subgroups of preterm women (P=0.05). No other clear patterns were seen regarding autoimmune diseases among preterm born or early term born subgroups.

Conclusion(s): Those born preterm develop hypothyroidism more often. However, the two other composite categories of autoimmune diseases were unrelated to gestational age pointing against an overall tendency toward autoimmune disease in preterm born young adults.

Cumulative incidence (1/100,000) of four groups of autoimmune diseases

	Hypoth ¹⁰⁴	Rheuma ²⁰²	UC&CD ²⁰⁸	n
Men				
0 <31	0	597	398	1005
1 32 or 33	263	658	395	760
2 34 to 36	206	494	762	4856
3 37	149	512	776	6057
4 38	140	504	625	15687
5 39 to 41	122	550	692	85753
6 >41	120	519	798	5010

	99 missing	0	512	448	1563
	Total	128	539	687	120690
	P-value	0.40	0.99	0.49	
	(Chi ²)				
Women	0 <31	649	519	389	771
	1 32 or 33	651	163	814	614
	2 34 to 36	771	795	675	4149
	3 37	502	929	799	5380
	4 38	537	975	692	14152
	5 39 to 41	460	1056	704	83712
	6 >41	278	1069	684	4678
	99 missing	474	880	609	1477
	Total	478	1021	702	114932
	P-value	0.05	0.16	0.95	
	(Chi ²)				

202 Disseminated connective tissue disorders, rheumatoid arthritis and other rheumatic diseases (A04.6, A39.8, A50.5, D76.0, D76.3, H20.1, H30, I33.0, I40.8, J84, K50.9, K51.9, K73.2, K74.3, K83.0, L40.5, M02, M05, M06, M08, M13.9, M30–M35, M45, M46.1, M46.9, M94.1, N03, N04, Q44.2).

104 Hypothyroidism

208 Ulcerative colitis or Crohn's disease

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THU0670 PATERNAL USE OF METHOTREXATE AND CONGENITAL MALFORMATIONS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: Maternal exposure to methotrexate (MTX) during pregnancy is known to be teratogenic, but less is known about the risk due to paternal MTX exposure. Because of a theoretical teratogenic risk from paternal exposure, treatment recommendations advocate that men should discontinue MTX three months before conception and continue discontinuation during the partners' pregnancy. This may lead to suboptimal adherence to treatment, fear among the future parents and pregnancy termination.

Objectives: The aim was to systematically review and meta-analyze the collective data on paternal MTX exposure and the risk of congenital malformations.

Methods: We performed a systematic search in the databases – PubMed, Embase, Cochrane Central, and Cinahl – on March 1, 2018. We included studies with an English abstract that assessed major or all (both major and minor) malformations following any paternal exposure to MTX. Studies that included a control group were included in the meta-analysis. No time restriction was applied. Review Manager Version 5.3 was used for the meta-analysis.

Results: We identified 36 studies assessing the risk of congenital malformations following paternal exposure to MTX of which 20 contained original data. Five studies met the inclusion criteria for the meta-analysis: Three studies from Denmark had a major overlap in study populations, one study from Norway, and one German study. All studies were cohort studies using national registries except the German that used structured interviews and phone interviews. Because of the overlapping Danish studies, only the largest Danish study for each of the outcomes were included. We included a total of 265 fathers exposed to MTX and 1,004,834 controls in the meta-analysis investigating risk of major congenital malformations. Among the offspring of the MTX-exposed 7 (2.64%) had a major malformation compared to 33,816 (3.37%) among the unexposed. Pooled odds ratios were 1.02 (95% confidence interval [CI] 0.48-2.20) for major malformations and 1.02 (CI 0.62-1.66) for all malformations.

Conclusion(s): In this systematic review and meta-analysis, we found no association between preconceptional paternal MTX use and major or all congenital malformations. The current recommendations to avoid paternal MTX use before conception do not appear to be supported by evidence and paternal treatment with MTX could be continued when planning a pregnancy.

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