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FRI0055

AN EQUATION FOR ESTIMATED CARDIORESPIRATORY FITNESS IN RHEUMATOID ARTHRITIS PATIENTS IS NEEDED

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Background: RA patients are deconditioned and on average have decreased cardiorespiratory fitness (CRF, peak oxygen uptake) compared to the general population (1). This may contribute to an increased risk of cardiovascular disease (CVD). Because CRF is associated with cardiovascular health, it is important to assess. For the general population, various equations exist for estimation of CRF (eCRF) without the need of a resource-intensive cardiopulmonary exercise test.

Objectives: Compare eCRF of people without RA to eCRF of RA patients, using recognized equations for eCRF (2,3) based on gender, age, resting heart rate, waist circumference and self-reported physical activity.

Methods: Among participants with self-reported RA in the second and third surveys of the Norwegian population-based Nord-Trøndelag Health Study (HUNT2 and 3)(4), RA patients were identified from hospital case files using standardized diagnostic criteria (5). The mean eCRF of participants with and without RA were calculated and the 95% confidence intervals (CI) compared.

HUNT2	Men (no RA)	Men (RA)	Women (no RA)	Women (RA)
	Mean eCRF (CI), n	Mean eCRF (CI), n	Mean eCRF (CI), n	Mean eCRF (CI), n
30-39 years	50.3(50.2-50.5), 5,134	49.5(45.6-53.4), 8	40.3(40.2-40.4), 5,623	38.7(37.2-40.1), 25
40-49 years	46.2(46.1-46.3), 6,104	46.7(44.8-48.6), 22	36.6(36.5-36.7), 6,496	36.2(35.2-37.2), 72
50-59 years	42.2(42.0-42.3), 4,910	40.9(39.6-42.3), 50	32.9(32.8-33.1), 4,994	31.5(30.7-32.4), 75
60-69 years	38.3(38.2-38.5), 3,600	39.2(37.7-40.6), 40	29.0(28.9-29.1), 3,441	28.6(27.7-29.5), 71
70-79 years	34.7(34.5-34.9), 2,678	34.3(31.9-36.6), 20	25.3(25.2-25.5), 2,608	25.3(23.9-26.7), 32
80-89 years	30.4(30.0-30.8), 677	n=0	22.1(21.9-22.4), 871	24.0(18.1-29.9), 4
HUNT3	Men (no RA)	Men (RA)	Women (no RA)	Women (RA)
	Mean eCRF (CI), n	Mean eCRF (CI), n	Mean eCRF (CI), n	Mean eCRF (CI), n
30-39 years	46.6(46.4-46.9), 2,069	47.3(24.5-119.0), 2	37.1(36.9-37.2), 3,189	34.7(30.8-38.5), 9
40-49 years	43.3(43.1-43.5), 3,406	46.5(10.2-82.9), 2	34.8(34.7-34.9), 4,668	34.9(32.9-36.8), 21
50-59 years	39.5(39.4-39.7), 4,153	39.5(37.4-41.5), 19	31.5(31.4-31.7), 4,994	30.2(29.1-31.4), 56
60-69 years	36.2(36.0-36.3), 3,764	33.1(31.3-34.8), 41	28.2(28.1-28.4), 4,222	27.5(26.5-28.6), 58
70-79 years	33.0(32.8-33.2), 2,149	34.3(32.4-36.1), 35	24.9(24.8-25.1), 2,284	24.4(23.2-25.5), 41
80-89 years	29.7(29.4-30.1), 708	28.3(24.5-32.0), 8	22.6(22.3-22.8), 812	22.8(21.2-24.3), 14

Table 1. Mean eCRF (mL/(kg x min)) and 95% CIs of RA patients and participants without RA attending HUNT2 and 3. Age categories with n<8 RA patients in grey.

Conclusion: The eCRF CIs of RA patients and participants without RA were overlapping in all age categories except for men aged 60-69 years in HUNT 3 (Table1). This is contradictory to previous findings where RA patients were deconditioned compared to healthy controls (1). A probable explanation is that equations for eCRF were developed from healthy populations, and therefore overestimate eCRF in RA patients. For better CVD risk management including CRF as an important risk factor, an equation for eCRF developed specifically for RA patients is needed.

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FRI0056

NESTED CASE-CONTROL STUDY : ASSOCIATED FACTORS WITH INSULIN RESISTANCE IN A RHEUMATOID ARTHRITIS INCEPTION COHORT

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Objectives: To assess insulin resistance (IR) in patients with rheumatoid arthritis (RA) and compare it with healthy controls and to analyze the association between the accumulated inflammatory burden in patients with RA and IR.

Methods: Design: Nested case-control study. Population: consecutive RA-patients (ACR/EULAR 2010 criteria), >16 years, selected from a prospective inception cohort (diagnosis of RA between 2007 and 2011). Patients with Diabetes Mellitus (according to ADA 2010 criteria) were excluded. Controls: sex- age and BMI -matched controls were collected from a health center in our hospital area. Protocol: Cases and controls were evaluated by a rheumatologist. Clinical data of disease activity (RA patients), analytical values and oral glucose tolerance test (OGTT) were determined. Main outcome: IR measured by the homeostasis model for insulin resistance (HOMA-IR) (IR> 2.29 $\mu\text{U}^*\text{mmol/ml}$). Secondary outcome: IR measured by quantitative insulin sensitivity check index (QUICKI) (<0.337 $\mu\text{U}^*\text{mmol/ml}$) and by the homeostatic model assessment of β -cell function (HOMA β). Variables: Demographic, clinical-analytical variables, Disease Activity Score of 28 joints (DAS28-ESR), Health Assessment Questionnaire (HAQ), BMI (according to OMS classification) and glucose and insulin before and after OGTT values. Statistical analysis: Descriptive and paired T-test or Chi-square test followed by Multivariate Linear Regression in RA patients (Dependent variable: HOMA-IR).

Results: Two hundred subjects were studied, 31 of them were excluded after OGTT. Finally 169 subjects were included; 89 RA and 80 controls. The mean age of patients with RA was 56.6($\pm$ 10.9) years. Most of them were women (75.3%), with seropositive (FR 82.0% y ACPA 75.3%) and erosive (61.1%) RA. The average duration of the disease was 98 months (8.1 years). The delay in the diagnosis of RA was 10.9 months (5.4 - 25.6) with a mean DAS28 index since the beginning of the disease of 3.11 (0.8). Differences between clinical characteristics and in relation to IR between cases and controls are shown in Table 1. No significant differences in the proportion of subject with IR in cases and controls were observed and 28.1% of patients with RA had IR. Of the 25 patients with IR, the majority, 68%, presented a DAS28 score> 3.2 (moderate-high activity index). In multivariate analysis, the independent variables associated with IR in patients with RA were: Obesity [OR=6.01; β =1.795 (p=0.002), disease activity (OR=2.77; β =1.021 [p=0.009]) IL-1 β (OR=1.59; β =0.464 (p=0.024)). This model would explain 37.5% of the variability of the IR (R²=0.375).

Conclusion: We did not find an increased IR in patients with RA compared with healthy controls, which may be due to adequate treatment and good control of inflammatory activity in the most of patients with RA. Obesity, inflammatory activity (measured by mean DAS28 index) and IL-1 β were the predictors of IR in patients with RA in our study.

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Table 1

VARIABLE	CASES n=69	CONTROLS n=60	P-VALUE
Age, years, mean (SD)	56.6 (10.6)	56.4 (10.6)	0.902
Sex, women, n(%)	47(68.3)	47(78.3)	0.189
Tobacco			0.117
Never smoker, n(%)	42(61.2)	48(81.3)	
Former smoker, n(%)	23(34.7)	11(18.8)	
Current smoker, n(%)	25(38.1)	2(3.3)	
Comorbidity			
BMI > 30 (obesity), n(%)	30(33.7)	23(27.5)	0.608
BMI, mean (SD)	28.2 (6.8)	27.3 (4.8)	0.266
Dyslipemia, n(%)	21(23.8)	16(18.8)	0.442
Hypertension, n(%)	25(29.8)	23(27.5)	0.868
Infectious Risk Factors			
HOMA-IR > 2.26, n(%)	25(28.1)	24(30.0)	0.786
HOMA-IR, median (IQR)	1.7 (1.02-2.3)	1.66 (1.15-2.65)	0.386
HOMA-IR, median (IQR)	38.9 (22.1-63.3)	34.39 (24.0-64.8)	0.545
QUICKI, median (IQR)	0.306 (0.304-0.31)	0.306 (0.304-0.31)	0.211

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FRI0057 INSULIN RESISTANCE IN ELDERLY ONSET RHEUMATOID ARTHRITIS AND POLYMYALGIA RHEUMATICA

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Background: Rheumatoid arthritis (RA) patients have a higher insulin resistance (IR) and some studies report that it is present at diagnosis. Systemic inflammation has been pointed out as the reason. However, data on polymyalgia rheumatica (PMR) are controversial.

Objectives: To analyse IR in a group of untreated patients with a recent diagnosis of RA and PMR, and to establish predictive factors related with IR.

Methods: Longitudinal observational study of patients older than 60 years, newly diagnosed with elderly-onset AR (ACR/EULAR 2010) and PMR (ACR/EULAR 2012). Comparison with healthy control group of the same age. Inclusion: consecutive and voluntary. Exclusion: patients with insulin-dependent diabetes. Follow-up time: 12 months. The clinical-epidemiological, anthropometric and analytical characteristics were collected. IR was calculated by HOMA-IR [(homeostatic model assessment of insulin resistance) = glucose (mg/dL) * insulin (mIU/L)/405] baseline and at 12 months. HOMA-IR > 2.75 was considered IR (according to Spanish data). The statistical study was performed with Stata 15.1.

Results: We recruited 42 patients with RA, 18 with PMR and 18 healthy controls. None of them had received treatment with corticosteroids or with DMARD at the baseline visit. Baseline characteristics are summarized in the table.

	RA (N=42)	PMR (N=18)	P value
Epidemiological data			
Women n (%)	18 (42.9)	15 (83.3)	0.001
Age (mean ± σ)	74.4 ± 7.6	76.4 ± 5.2	0.594
Diabetes mellitus	15 (35.7)	3 (16.7)	0.140
BMI (kg/m ²)	27.7 [25.1-30.5]	26.5 [24.0-29.1]	0.393
Abdominal perimeter (cm)	100 [95-106]	94 [90-104]	0.076
Analytical data			
Glycohemoglobin%	6.1 [5.9-6.4]	5.8 [5.6-6.5]	0.107
ESR (mm/1 st hora)	49 [36-75]	52 [42-69]	0.508
CPR (mg/L)	24.4 [7.1-44.1]	22.1 [12.4-45.9]	0.670
RF positive n (%)	14 (33.3)	1 (5.6)	0.023
ACPA positive n (%)	13 (30.9)	2 (11.1)	0.104
RF and ACPA positive n (%)	17 (40.5)	3 (16.7)	0.073
Insulin resistance test			
HOMA-IR median[RIQ]	3.6 [2.1-5]	2.1 [1.6-3.4]	0.004

At baseline visit, 66.7% of patients with elderly-onset RA had IR, compared with 33.3% of controls (p=0.024) and 27.8% of PMR (p=0.006). Therefore, the prevalence of IR in patients with RA doubled that of controls and patients with PMR before starting treatment.

After 12 months of evolution and treatment, patients with RA and IR decreased from 66.7% to 51.2%, not being statistically significant (p=0.179). On the other hand, the percentage of patients with PMR and

IR remained the same (27.8%). The differences in IR between RA and PMR at 12 months remained statistically significant (p=0.048).

Given the results we decided to analyze the predictive factors related with IR only in the 42 patients with RA. In the univariate logistic regression analysis, the predictors of presenting IR were the BMI, the abdominal perimeter and the scapular girdle involvement. Specifically for BMI, for each of 2 kg/m² the probability of having IR was 1.24 times higher (OR=1.24, IC95%: 1.12-1.37). Patients with scapular girdle involvement had a 6-fold increased risk of developing IR (OR = 6.0, 95% CI: 1.3-26.6). And for every 5 centimetres of abdominal perimeter the risk increased almost 4 times more (OR=3.9, 95% CI: 2.9-5.1). In the multivariate analysis, the only independent factor to increase the IR was the abdominal perimeter (aOR = 1.23, IC95%: 1.07-1.41).

Conclusion: Patients with elderly-onset RA have a higher IR than the general population. High IR in RA is present at diagnosis. IR in AR is not exclusively mediated by systemic inflammation, since patients with PMR do not have this increase. The predictors of presenting IR in late onset AR were BMI, scapular girdle involvement and abdominal perimeter. Only the abdominal perimeter was shown as an independent factor.

Disclosure of Interests: None declared

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FRI0058 RHEUMATOID ARTHRITIS IS AN INDEPENDENT RISK FACTOR FOR DEVELOPING INFLUENZA REQUIRING HOSPITAL INPATIENT ADMISSION, COMPARABLE TO OLDER AGE AND GREATER THAN SMOKING, IN A LARGE, SINGLE-CENTRE COHORT

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Background: RA patients are known to be at increased risk of serious infection(1), particularly for respiratory infections such as influenza which are known to be associated with increased morbidity and mortality(2). Currently RA patients do not have enhanced access to high-dose influenza vaccination in our jurisdiction, despite the reported benefit in RA(3) and enhanced access for patients older than 65 years old. The magnitude of the risk from RA compared to smoking or age greater than 65 years old remains incompletely understood.

Objectives: To examine the association of RA, smoking, and age greater than 65 years old with hospital inpatient admissions for influenza.

Methods: We examined general medical inpatient admissions in a large tertiary hospital between January 2012 and December 2018. Major confounders (smoking status, age and gender) were selected based on causal inference analysis using a directed acyclic graph. Natural language processing and ICD-10 codes were used to determine the diagnosis of rheumatoid arthritis, smoking status and influenza diagnosis. These variables were used in a multivariable logistic regression analysis. The strength of association was assessed using adjusted odds ratios and associated 95% confidence intervals.

Results: We assessed 19,010 patients with at least one general medical inpatient admission during the study period, of which 495 had at least one admission primarily for influenza (Table 1). Within this cohort, there were 3791 patients identified as active smokers and 731 with a history of RA. In the multivariable model, patients with a history of RA were more likely to have at least one admission for influenza (OR 1.65 [1.12 - 2.36]). This risk was comparable to that experienced by patients older than 65 years old in an unadjusted analysis (OR 1.62 [1.29 - 2.04]) and stronger than that experienced by smokers in an unadjusted analysis (OR 1.38 [1.12 - 1.69]).

Conclusion: RA patients are at independent risk of influenza leading to a hospital inpatient admission, with a magnitude comparable to that of patients aged over 65 years old and greater than that of smokers. Funding authorities should consider making influenza vaccination available for RA patients in a comparable way to that available to patients aged over 65 years old.

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