Cardiovascular Disease Risk Factors May Negatively Impact Rheumatoid Arthritis Disease Outcomes: Findings from the Ontario Best Practices Research Initiative.

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Background. Rheumatoid arthritis increases the risk of cardiovascular disease (CVD). Less is known about the direct influence of CVD on RA outcomes, but higher comorbidity burden has been suggested to adversely affect RA treatment response. We tested our hypothesis that CVD risk factors (RFs) alone, in the absence of CVD, are associated with higher disease activity and disability in RA.

Methods. The Ontario Best Practices Research Initiative (OBRI) is a clinical registry of RA patients followed in routine care. RA subjects with complete data to calculate disease activity according to the Disease Activity Score-28 (DAS28), Clinical Disease Activity Index (CDAI), 28 swollen joint count (SJC28) and functional status (Health Assessment Questionnaire Disability Index [HAQ-DI]) at cohort entry were selected. Patients were divided into mutually exclusive groups by baseline CVD status as: (1) no CVD/no CVD RFs; (2) CVD; (3) no CVD but CVD RFs including hypertension (HTN), dyslipidemia (DLP), diabetes (DM), or smoking. We performed separate linear regression analyses, adjusted for baseline clinical and demographic variables, to determine the independent effect of CVD status on disease outcomes at baseline.

Results: Of 2033 patients examined, 54% had no CVD, 5% had CVD and 41% had CVD RFs alone. The most common RF was HTN (23%) followed by current smoking (17%), DM (12%) and DLP (5%). The majority had 1 CVD RF (34%) with decreasing frequency of 2 (8%), 3(2%) or all 4 (0.3%) risk factors. Subjects with CVD or CVD RFs were significantly older, had less education, higher ESR, higher joint counts, higher pain scores and greater number of non-CVD comorbidities. In cross-sectional analyses, having a CVD RF was associated with significantly higher composite disease activity scores (DAS28 and CDAI), and HAQ-DI scores (Table). No association between CVD status and swollen joint count was observed.

Conclusion: Even in the absence of CVD, traditional CVD risk factors are associated with greater RA disease severity and disability. Self-perceived impact of comorbidity (patient global assessment of health) may be driving this relationship. Investigation into the magnitude of effect for the individual CVD RFs, and whether differences in RA treatment patterns by CVD status may mediate this relationship is warranted. This will help determine if CVD RFs are truly poor prognostic markers for RA outcomes.

Table1. Multivariable linear regression of disease activity outcomes and functional status at baseline according to CVD status.

	β - coefficient (95% CI); p-value			
	DAS28-ESR	**CDAI**	**SJC-28**	**HAQ-DI**
No CVD / No CVD RFs	Ref	Ref	Ref	Ref
CVD	**0.39 (0.03, 0.75); 0.03**	2.29 (-0.85,5.43); 0.15	0.76 (-0.39, 1.92); 0.20	0.15 (-0.19, 0.31); 0.08
CVD RFs / No CVD	**0.28 (0.11, 0.44), 0.001**	**1.70 (0.25, 3.14); 0.02**	0.39 (-0.14, 0.92); 0.15	**0.20 (0.12, 0.27); <0.0001**

Models adjusted for age and gender; furthermore, variables that were significantly associated with both CVD status and disease outcomes were also considered (e.g. education, other comorbidities, annual household income, and health insurance coverage)