Advocating for Rheumatoid Arthritis and Cardiovascular Health (ARCH): A Systems-Based Screening Initiative in a US Tertiary Referral Center

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Background

Patients with rheumatoid arthritis (RA) have an increased risk of cardiovascular disease (CVD). Cardiovascular events account for roughly half of all deaths in RA patients. CVD occurs early in patients with RA, and with nearly twice the event rate compared to the general population. The increased CVD risk persists despite marked improvements in RA treatment. Although patients with RA appear to have equally frequent and as severe CVD as patients with diabetes mellitus (DM), recent data suggests that primary care providers fail to screen RA patients for CVD risk as consistently or aggressively as patients with DM.

Multiple barriers such as limited time and lack of familiarity of CVD screening guidelines challenge the feasibility of this practice.

A gap in patient care was identified by our rheumatology and cardiology teams related to RA patients who had modifiable cardiovascular risk factors. Physician leads from each of these clinical areas joined with members of our Professional Education, Biostatistics, Nursing, Medical Assistants, and Health Initiative departments to initiate a 28-month performance and quality improvement (QI) project.

Purpose

This QI project aimed to increase RA patient awareness of CV risks, improve the process for screening and documenting CV risk factors, increase referrals to systems-based resources that target modifiable risk factors, and demonstrate improved patient outcomes related to modifying those risk factors.

In this abstract, we evaluated the efficacy of our practice improvement project. In addition we, assessed whether patients with chest computed tomography (CT) imaging and evidence of coronary disease were screened and medications changed to target their CVD risks.

Methods

General overview of the QI initiative
At National Jewish Health, a tertiary referral center, we implemented an integrated system to provide RA patients direct access to evaluation by a cardiologist for CVD risk assessment. This quality improvement project offers an innovative approach that has not previously been employed.

In the new RA-CVD clinic workflow, the rheumatologist can screen for CVD risk factors during a clinical visit and refer RA patients to cardiology using a prescribed order set.

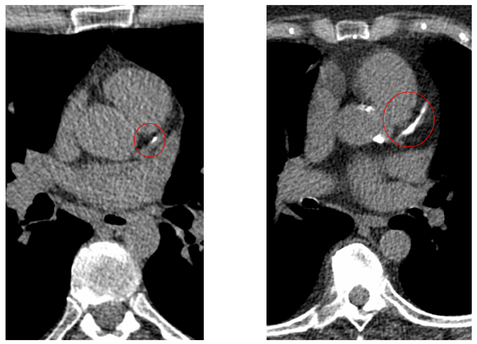
Once the order is placed, the patient is scheduled for evaluation by cardiology. During that evaluation, the patient's10-year risk for atherosclerotic cardiovascular disease (ASCVD) score is calculated and therapies aimed at decreasing that risk are discussed and/or initiated.

The initiative utilizes Performance Improvement Continuing Medical Education (PI CME) and Plan, Do, Study, Act (PDSA) frameworks to institute interventions and measure outcomes consistently throughout the project.

Methods (continued)

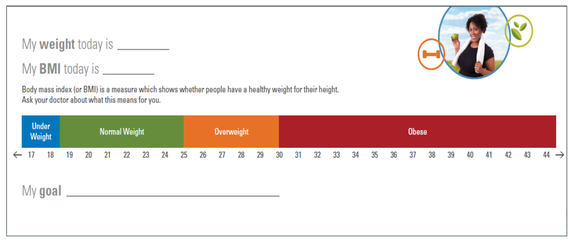
Analyses for this study
We reviewed the medical records of all RA patients presenting to our hospital for new or follow up appointments in 2015 when the rheumatology CVD risk assessments began. Charts were reviewed for: baseline characteristics, a recent chest CT scan, and medication use. A cardiovascular CT board certified cardiologist reviewed the CT reports for the presence or absence of coronary calcification. In cases where coronary calcification was not specifically mentioned in the report, review of the primary images was performed.

Process and Review of CT scans



Visual scoring of coronary artery calcium (CAC) has been shown to have good agreement with Agatson CAC scores, which in turn, correlate to clinical outcomes. Rising rates of cardiovascular deaths with increasing CAC scores has been demonstrated.

Patient Awareness/Education Tools Related to Modifiable CV Risk Factors



Demographic and Clinical Characteristics

Demographics	Total N = 251	Women N = 189 (75%)	Men N = 62 (25%)
Age, years	56.5	55.8	58.7
Average BMI	30.4	31.6	29.0
BMI > 25	197 (78%)	148 (78%)	49 (79%)
Current or past smoker, no (%)	155 (62%)	108 (57%)	47 (76%)
Never smoker, no (%)	96 (38%)	81 (42%)	15 (24%)
Hypertension, no (%)	90 (30 Dx in 2015)	72 (25 Dx in 2015)	18 (5 Dx in 2015)
Diabetes, no (%)	44 (19 Dx in 2015)	32 (14 Dx in 2015)	11 (5 Dx in 2015)
Statins, no (%)	92 (37%)	65 (35%)	27 (44%)

Laboratory Data	Total	Women	Men
CRP, mg/dL (N = 235)	0.93	0.88	1.07
ESR, mm/hr (N = 165)	23	25	18
RF positive (> 14 IU/mL)	154 (61%)	113 (60%)	41 (66%)
CCP positive (≥ 20 units)	164 (65%)	120 (64%)	44 (71%)
Hemoglobin A1C (N = 200)	5.71	5.71	5.72
Lipids ordered, no (%)	189 (75%)	141 (75%)	48 (77%)
Total cholesterol, mg/dL	182	187	167
HDL cholesterol, mg/dL	52	55	41
LDL cholesterol, mg/dL	102	103	98
Triglycerides, mg/dL	160	153	189

Imaging	Total	Women	Men
Chest CT	104	81 (78%)	23 (22%)
No CAC	53	46 (87%)	7 (13%)
Yes CAC	51	35 (69%)	16 (31%)
		Of 81 women with chest CT, 35 (43%) had positive CAC	Of 23 men with chest CT, 16 (70%) had positive CAC

Quality Improvement Measurements	Total	Women	Men
MDHAQ recorded	187 (74%)	142 (75%)	45 (24%)
10 yr ASCVD score calculated	61 (24%)	42 (22%)	19 (31%)

Results

There were 683 RA patients seen during the study interval and 251 were screened and referred for CV risk assessment. A significant number of patients are current or past smokers. The majority are seropositive and have normal lipid and hemoglobin A1C levels.

We found 104/251 (41%) of the patients had a chest CT available for review. 51/104 (49%) had some presence of coronary calcifications on chest CT and 39/104 (37%) were either on or started on a statin. While more women were found to have had a chest CT, men with a chest CT were more likely (70% vs. 43%) to have positive coronary calcium.

We have recorded MDHAQs on 74% of the RA patients and 24% have an ASCVD risk score. Prior to this project, we had not done routine assessments or recorded them in our electronic medical records.

Limitations

This is a quality improvement project which limits the strength of the associations. A prospective study to assess CVD screening and the impact on care over time would strengthen the conclusions from this study.

Conclusions

RA patients seen in our tertiary hospital were effectively screened for CVD risk and aggressively treated, but we found that not all patients could be screened. Our institution was amenable to the practice changes which utilized multiple members of the health care team, and implementation among other hospitals may be a feasible option.

The cardiology assessments are useful and can lead to medication additions or changes. Furthermore, the new workflow has enabled the rheumatologists to take part in CVD and diabetes screening and discovery of these diseases.

Our study suggests that RA patients would benefit from a CVD assessment to determine the necessary interventions and recommendations to optimize care. Our program allows for a streamlined approach to screening and facilitates easy access for the evaluation.

References

Peters MJ et al. EULAR evidence-based recommendations for cardiovascular risk management in patients with rheumatoid arthritis and other forms of inflammatory arthritis. Ann Rheum Dis. 2010 Feb;69(2):325-31.

Gossec L et al. Challenges of cardiovascular risk assessment in the routine rheumatology outpatient setting: an observational study of 110 rheumatoid arthritis patients. Arthritis Care Res. 2013 May;65(5):712-7.

Ikdahl E et al. EULAR task force recommendations on annual cardiovascular risk assessment for patients with rheumatoid arthritis: an audit of the success of implementation in a rheumatology outpatient clinic. Biomed Res Int. 2015;2015:515280. Epub 2015 Mar 1.

Martin-Martinez MA, et al. Recommendations for the management of cardiovascular risk in patients with rheumatoid arthritis: scientific evidence and expert opinion. Semin Arthritis Rheum. 2014 Aug;44(1):1-8.

Rosales-Alexander JL et al. Cardiovascular risk assessment in rheumatoid arthritis: impact of the EULAR recommendations on a national calibrated score risk index. Clin Exp Rheumatol. 2014 Mar-Apr;32(2):237-42.

Primdahl J et al. Results from a systematic screening for cardiovascular risk in outpatients with rheumatoid arthritis in accordance with EULAR recommendations. Ann Rheum Dis. 2013 Nov;72(11):1771-6.

Gomez-Vaquero C et al. Assessment of cardiovascular risk in rheumatoid arthritis: impact of the new EULAR recommendations on the score cardiovascular risk index. Clin Rheumatol. 2012 Jan;31(1):35-9.

Peters MJ and Nurmohamed M. Cardiovascular risk management in rheumatoid arthritis: are we still waiting for the first step? Arthritis Res Ther 2013,15:111.

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