Assessment of Cardiovascular Disease Risk and Therapeutic Patterns among Urban Black Rheumatoid Arthritis Patients

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Background/Purpose

- Patients with rheumatoid arthritis (RA) have nearly twice the risk of cardiovascular disease (CVD) compared to the general population. Besides the traditional risk factors, patients with RA also have increased risk due to chronic inflammation and elevated cytokine levels.
- Specialized CV risk models for RA that include disease activity measures, disability index, duration of disease and steroid use in addition to traditional risk factors. Modern therapy including DMARDs and biologics have been shown to decrease CVD in RA populations.
- We aim to assess the prevalence of CVD risk factors including traditional (Obesity, hypertension, diabetes, dyslipidemia and smoking) as well as non-traditional ones (inflammatory markers, length of disease and disease severity among) in our RA predominantly Black population. We also examined the therapeutic patterns, compared to a predominately White population of the Consortium Of Rheumatology Researchers Of North America (CORRONA).

Methods

- Retrospective study of patients ≥18 years old with a Principal or Secondary discharge diagnosis of Rheumatoid Arthritis (RA) identified by ICD-9 and ICD-10 codes. We included inpatient discharges between 1/2010 to 5/2017 from two large NYC hospitals with a predominantly Black population.
- Two independent investigators reviewed the cases identified by ICD-codes to confirm RA diagnosis and presence of disease modifying anti-rheumatic drugs (DMARD) in the medication list.
- Cases were excluded for insufficient data for RA diagnosis, no current or past DMARD therapy and/or non-RA diagnosis of arthritis. Data abstraction was performed utilizing the predesigned data collection sheet for the study. Collected data was verified by a second investigator. Hand images were reviewed utilizing the Simple Erosion Narrowing Score by a musculoskeletal radiologist.
- Descriptive statistics was applied. We used measures of central tendencies and dispersion for continuous variables and frequency distribution for categorical variables. Data was presented as the mean ± standard deviation (±SD).
- We compared our predominantly Black RA population to previously published RA data with predominantly White cohorts; Consortium Of Rheumatology Researchers Of North America (CORRONA) to assess differences in CVD and CVD risk profile and features of RA disease severity as well as therapeutic patterns including the use of steroids, DMARDS and biologics.

Results

- Of the 1,142 RA patients, 500 were confirmed as RA cases and included in the study. Mean age was 64.6±14.8 (*± SD),* 87.8% were women, 83.4% were Black and 9.2% Hispanics. BMI was 28.8 ± 7.5 with 37% of the patients having BMI ≥30(Kg/m^2).
- Our predominantly Black (83.4%) cohort with RA duration of 13.1 ± 9.7 years was compared to predominantly White (89%) CORRONA cohort with RA duration of 10.1 ± 9.8 years. There were higher rates of CVD risk factors: hypertension (66.4% vs. 29%), dyslipidemia (41% vs. 25%), diabetes (28.0% vs. 8%) for our cohort compared to CORRONA respectively. Our cohort had lower rate of smoking (29.5% vs. 34%), compared to CORRONA cohort. Myocardial infarction or known coronary artery disease (19.4%) was similar to that reported in the CORRONA study. The rate of other CVD in our cohort that were not reported in the CORRONA study were: congestive heart failure (14.8%), stroke or transient ischemic attack (10.2%) and atrial fibrillation (8.4%).
- In our study, erythrocyte sedimentation rate (ESR) was 62.4 ± 37.2mm/hr. and 76.2% had C-reactive protein (CRP) >4mg/L. Serological markers: Rheumatoid factor (RF)+ 75.5%, anti-citrullinated peptide antibodies (ACPA)+ 69.3%, RF+ or ACPA+ 85.8% (77% in the CORRONA cohort), and dual RF and ACPA+ 54% of the patients.
- Utilizing Simple Erosion Narrowing Score -**SENS**- (not reported in the CORRONA study); hand X-rays revealed: periarticular osteopenia, joint space narrowing and joint erosions in 96.6%, 72.2% and 67.8% respectively. Erosion score (maximum 32) was 12.6 ±11.7 and joint space narrowing score (maximum 30) was 20.6 ±11.9.
- Prednisone was used in 56% (30% in the CORRONA population) with average dose 8.14 ± 17.5mg/day, 22% (61% for the CORRONA study) on NSAIDs, 40% (84% for the CORRONA cohort) on methotrexate (average dose 6.6 ± 8.5mg), 42.5% on other DMARDs and 16% (56% for the CORRONA patients) were on biologics.

Total Number of RA Patients = 500 Patients ≥18 years old	
No. of women	87.8% (439)
No. of men	12.2% (61)
Entire cohort mean age (mean ± SD)	64.6 ± 14.8
Women age in years (mean ± SD)	65.1 ± 14.38
Men age in years (mean ± SD)	61.2 ± 17.1
Race/ethnicity	
White	7.2% (35/483)
Black	83.4% (403/483)
Other	9.3% (45/483)
Hispanics	9.2% (39/421)
BMI in Kg/m^2 (mean ± SD)	28.8 ± 7.51
BMI in Kg >30	36.8% (166/450)
BMI in Kg <20	7.5% (34/450)
Smoking	
Never	70.6% (320/453)
Current	11.5% (52/453)
Previously	18% (81/453)

Comorbidities	
CHF	14.8% (70/471)
CKD	11.6% (55/473)
Diabetes Mellitus	28% (133/474)
Hypertension	66.4% (322/485)
Atrial fibrillation	8.4% (39/462)
Dyslipidemia	40.9% (189/462)
Previous CVA/TIA	10.2% (46/452)
Previous MI or known CAD	19.4% (86/442)
GERD	20.6% (98/476)
Asthma	17.2% (82/476)
Previous sepsis episode	11.6% (54/464)
COPD	11.9% (56/472)
Sickle Cell	2.2% (10/452)
VTE	12.8% (59/461)
Cancer	11.9% (56/469)
Disease duration in years (mean ± SD)	13.1 ± 9.7
Laboratory Data	
ESR	62.4 ± 37.2
CRP	48.7 ± 70.3
% of patients w/CRP>4	76.2% (211/277)
CRP > 4 (mean ± SD)	63.7±74.97
Positive RF	75.2% (185/245)
Positive ACPA	69.3% (122/176)
Positive RF or ACPA	85.8% (199/230)
Positive RF and ACPA	54% (108/200)
Positive Antinuclear Antibodies	71/177 (43.5 %)

Simple erosion narrowing score (SENS) Preliminary data 106 cases hand imaging reviewed (total: 218 patients with hand imaging)	
Abnormal hand imaging	95.3% (101/106)
Periarticular osteopenia	96.6% (98/101)
Erosions	67.8% (68/101)
Joint space narrowing	72.2% (74/101))
Erosion score (maximum score = 32)	12.6 ± 11.7
Joint space narrowing (max score = 30)	20.6 ± 11.9
Medications	
Prednisone (PDN)	55.9% (236/422)
PDN daily dose (mean ± SD)	8.14 ± 17.5mg
NSAIDS	21.8% (87/399)
Narcotics	7.9% (32/404)
Methotrexate (MTX)	40.3% (173/429)
MTX weekly dose (mean ± SD)	6.6 ± 8.5mg
Other DMARDs	42.5% (150/353)
Biologics	16% (67/417)

Conclusions

- This is the first study of CVD in Blacks with Rheumatoid Arthritis (RA) including assessment of disease severity and therapeutic patterns compared to Whites. We observed higher rates of CVD risk factors including obesity, diabetes, hypertension, dyslipidemia, compared to the White cohort of the CORRONA study. Our population had aggressive disease with high rates of sero-positivity, joint narrowing/erosions and elevated inflammatory markers. Our RA Black cohort had nearly double the rate of steroid use (a risk factor for CVD) and less than one third utilization of biologics, (which lowers the risk of CVD risk), compared to Whites of the CORRONA study.