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Hypertension and Aortic Regurgitation are More Prevalent in Patients with Rheumatoid Arthritis Compared to Osteoarthritis and Controls

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Abstract Title: Hypertension and Aortic regurgitation are More Prevalent in Patients with Rheumatoid Arthritis Compared to Osteoarthritis and Controls

Background:

Rheumatoid arthritis (RA) increases the risk of developing cardiovascular disease (CVD). As well, cardiac involvement, particularly the mitral valve, is widespread in RA patients with a higher incidence of congestive heart failure. Such clinical notion led to the emerging field of Cardio-Rheumatology needed for risk stratification and optimization of preventive strategies[8]. Echocardiography is a valuable tool to identify cardiovascular manifestations. Due to the scarcity of data regarding cardiac disease in RA patients from the Middle East population, we studied echocardiographic features in RA patients compared to their age, sex, and traditional CVD risk factors matched osteoarthritis and controls.

Method(s):

In a cross-sectional study, we recruited 52 RA patients(46 females and 6 males) meeting the ACR-EULAR criteria of RA, and sex, traditional CVD risk factors matched osteoarthritis "OA" (n=58, 53 females and 5 males) and controls(n=15; 13 females and 2 males). Standard trans-thoracic echocardiography examination was carried out by a specialty cardio-sonographer who was blinded to the status of the participants. Left ventricular dimensions, wall geometry, ejection fraction, diastolic parameters, right ventricular size and function, valve structure and function, pericardium, pulmonary pressures, and aortic root dimensions were assessed by echocardiography. T-test and chi-2 tests were used to compare the echocardiographic findings between the two groups, while ANOVA was applied for more than two groups' comparison. A p-value of <0.05 was considered significant.

Result(s):

Although the median age was (41±12 years) for the controls "without RA or OA", (52±11 years) for OA patients, and (48±15 years) for the RA patients, yet the age difference between OA and RA was within the same age group for CVD risk factors. When using patients' age as a risk for developing CVD, the risk

doubles every 7.6 years, so the difference in echocardiography findings, when present, can indicate disease-specific findings rather than just age-related changes (Figure 1).

RA showed more hypertension history; (54.1%), (45.9%) of the OA group, and 0% of the control ($p=0.01$) (Table 1). On examination, patients with RA showed significantly higher diastolic blood pressure (DBP) at (76.58 ± 9.9 mmHg) compared to OA patients (73.04 ± 9.4 mmHg) and controls (70.21 ± 10.2 mmHg), $p=0.05$. In addition, systolic blood pressure (SBP) was also higher in RA patients (129.35 ± 17.7 mmHg) compared to OA patients (125.85 ± 15.5 mmHg) and controls (117.21 ± 11.1 mmHg), $p=0.04$ (Figure 2.).

Among the different numerical variables generated by the echocardiography study, only aortic root measurements showed significant differences between the groups. Patients with OA had higher aortic root diameter (26.4 ± 3.6 mm) than controls (22.7 ± 6.1 mm) (Table 2, Figure 3)

Although RA showed a higher root diameter (26.5 ± 3.7 mm) than controls, the difference was statistically insignificant (Figure 3). But, looking at the categorical variables generated by the echocardiography study, the percentage of aortic regurgitation was statistically different between the groups. A total of 12 cases with aortic regurgitation represent 10% of the cohort. Nine out of the 12 patients with aortic regurgitation were in the RA group (75%), and three were in the OA group (25%) (Table 3).

Conclusion(s):

Although OA patients were older than RA but within the same CVS age-related risk of RA and controls. Patients with RA and OA showed higher DBP, higher SBP, and reported hypertension, Patients with OA but not RA showed higher aortic root diameter compared to controls