

Assessment of Sub-clinical Left Ventricular Dysfunction in patients with Rheumatoid Arthritis using Strain Imaging: A Systematic review and Meta-Analysis

Introduction:

Rheumatoid arthritis (RA) increases the risk of cardiovascular diseases and is associated with a 2-fold increase in heart failure. Measuring global longitudinal strain (GLS) by speckle-tracking echocardiography and Cardiac magnetic resonance imaging is a sensitive marker of myocardial deformation and can detect LV dysfunction prior to reduction in LV ejection fraction (EF). We conducted a systematic review and meta-analysis to assess GLS in RA patients without known cardiovascular disease compared to healthy controls.

Methods:

PubMed, Embase and Cochrane databases were searched for studies comparing GLS in RA patients vs healthy controls (HC). Primary outcome was mean GLS. Secondary outcomes were LV global circumferential strain (LV-GCS) and right ventricular (RV) GLS. Mean difference (MD) with corresponding 95% confidence intervals (CIs) were calculated using the random-effects model.

Results:

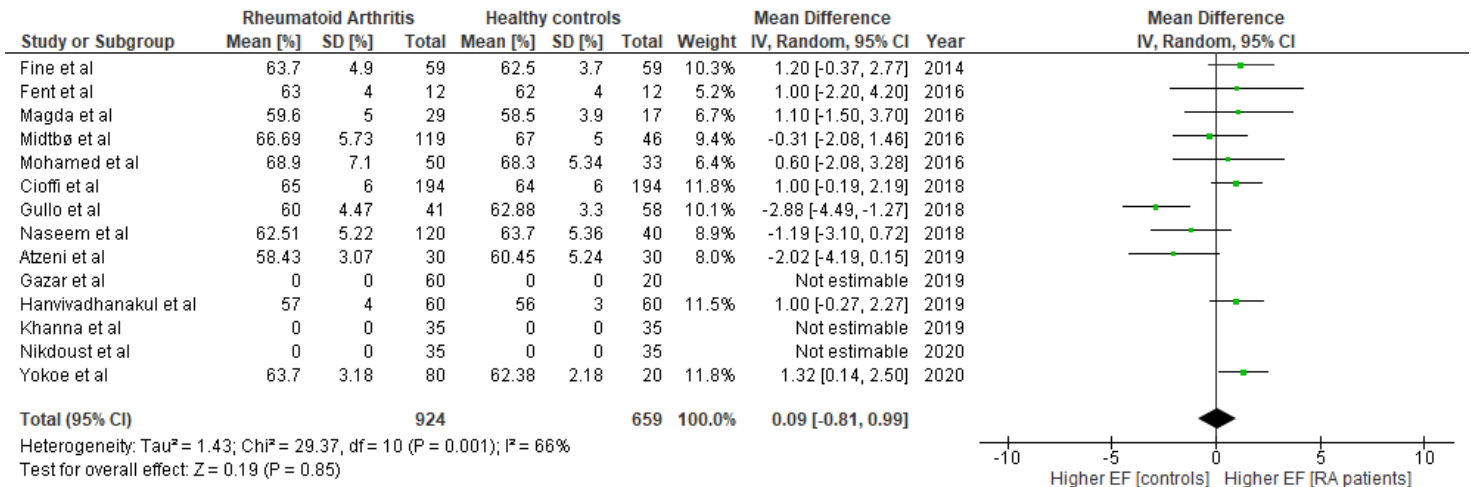
14 studies met inclusion criteria, with a total of 1583 patients (RA group 924, HC group 659), of which 881 were females (RA group 544, HC group 337). LVEF were similar in both groups (MD 0.09 [-0.81, 0.99]; $p=0.85$). There was significantly lower GLS in RA patients as compared to healthy controls (MD 2.13 [1.32, 2.93]; $p<0.00001$). Significantly lower LV-GCS was seen in RA patients as compared to controls (MD 3.40 [1.87, 4.93]; $p<0.0001$). Although RA patient had lower mean RV-GLS compared to controls, the difference was not statistically significant (MD 1.45 [-0.94, 3.84]; $p=0.23$).

Conclusion:

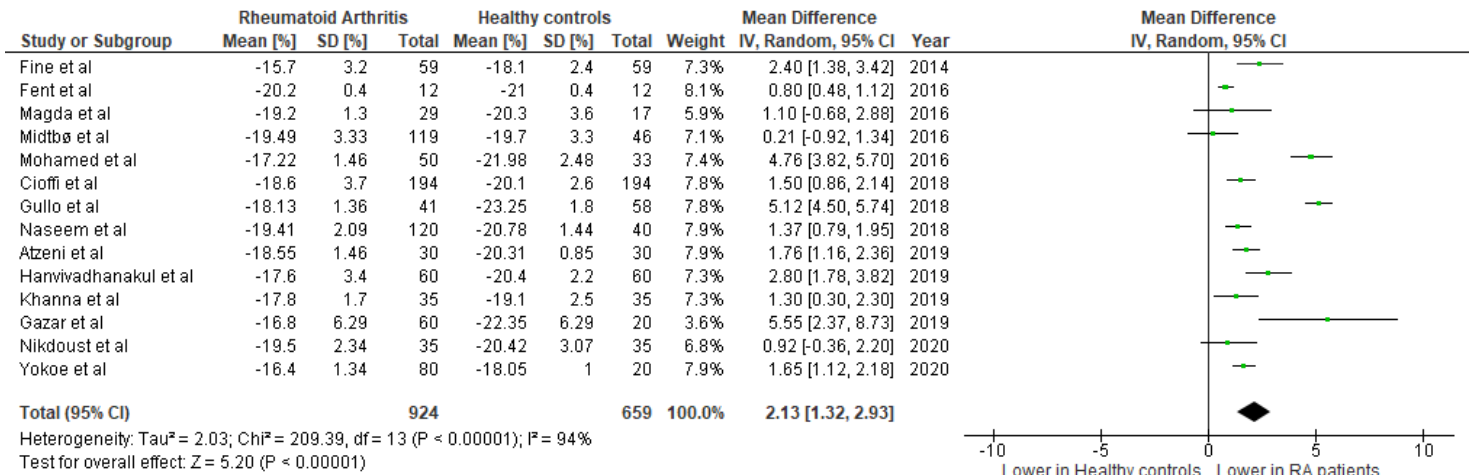
In our meta-analysis RA patients without clinical CV disease have reduced GLS indicating subclinical LV dysfunction. Clinical implications of using strain imaging in chronic inflammatory conditions like RA are yet to be determined.

Figure 1: Forest plots of primary and secondary outcome

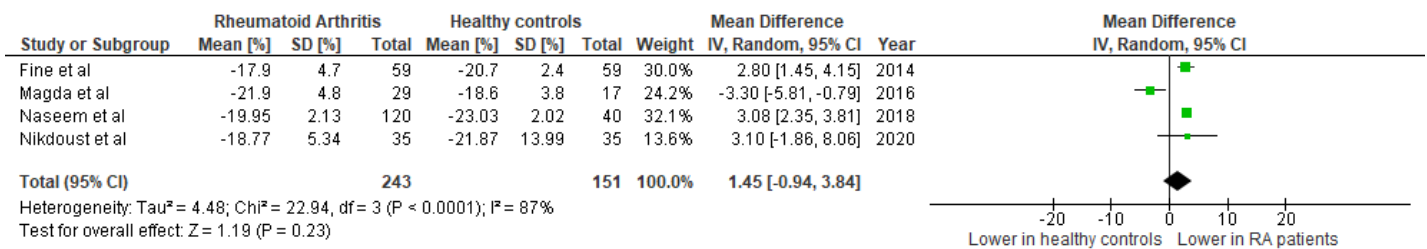
A) Left Ventricular Ejection Fraction



B) Left Ventricular Global Longitudinal Strain



C) Right Ventricular Global Longitudinal Strain



D) Left Ventricular Global Circumferential Strain

