Title: Autoantibody profile of patients with rheumatoid arthritis and its clinical correlation with disease activity, radiographic joint erosion and extra articular manifestations-a cross sectional study from a tertiary care centre in eastern India

Background: We are approaching towards precision medicine and individualised treatment plans for patients with autoimmune diseases including rheumatoid arthritis. Role of autoantibodies could not be emphasized more in this regard. We, in clinical practice, often over rely on Rheumatoid factor (RF) and Anti CCP for the diagnosis and management of patients with rheumatoid arthritis. And our so called 15-20% seronegative RA patients behave heterogeneously. If facilities for testing of other RA-associated autoantibodies are available in a cost effective manner the size of seronegative RA population will come down drastically. It will help us to get more homogenous RA patients and facilitate more research in this filed. Moreover, the predictive value of individual autoantibody will help us to adopt personalised treatment approach. Although ample amount of western data is available, there is severe scarcity of Indian data with respect to autoantibody profile of patients with Rheumatoid arthritis.

Although RA is the most common form of inflammatory arthritis, so in our set up, there is an unmet need of complete autoantibody profiling of RA patients in our genetic background. The proposed study will help us to categorise out patients based on auto antibody prevalence, to understand their role in predicting severity of disease and to adopt appropriate treatment approach for our patients. Nevertheless, the outcome of current study might stimulate further genetic studies in the field.

Aims: Autoantibody profile of patients with rheumatoid arthritis and its clinical correlation with disease activity, radiographic joint erosion and extra articular manifestations

Objectives:

Primary: To estimate the prevalence of autoantibodies (***Rheumatoid factor of IgM, IgG, IgA subtypes, Anti CCP2, Anti Car P antibody, anti MCV antibody, Anti PADI4 Ab***) in rheumatoid arthritis

Secondary:

- To determine the correlation of specific RA-related autoantibody with disease activity, radiographic joint erosion and extra-articular manifestations
- To study the correlation of autoantibodies with each other

Pilot data: NA

Materials and methods:

The study will be conducted in the rheumatology department of All India Institute of Medical Sciences, Kalyani. The patients from OPD and IPD will recruited for the study after applying inclusion and exclusion criteria.

Inclusion criteria: Patients fulfilling **2010 ACR classification** criteria of rheumatoid arthritis

- Age 18-80 years and
- Duration of disease: established disease, duration >6 Months

Exclusion criteria:

- Critically ill patients
- Comorbidities: CKD, CLD, malignancy, CAD, Diabetes with related complications, Hypertension with complications (however patients with well controlled Diabetes, hypertension without complications)
- Patient not willing to participate in the study

Comprehensive clinical assessment, mandatary laboratory investigations needed for routine care will be done for each participant. Disease activity (DAS 28-ESR, DAS 28-CRP, CDAI, and SDAI) will be calculated for all patients. The data will be tabulated in appropriate format. Serum sample will be collected for all patients and stored in -80 degree Celsius for further testing of desired autoantibodies. We will perform ELISA based quantitative assessment of Rheumatoid factor of IgM, IgG, IgA subtypes, Anti CCP2, Anti Car P antibody, anti MCV antibody, and Anti PADI4 Ab. Appropriate statistical analysis of available qualitative and quantitative data will be performed.

Anticipated outcome: Prevalence of each antibody in RA patient will be estimated. We will also examine the correlation of each antibody with the measured disease activity, radiographic joint erosion and extra articular manifestations.

Timeline of the study: our plan is to conduct the study in the following time-bound manner. We will start the data collection immediately after approval and intend to finish the study within 6 months.

Data collection: 5 months; all patients with rheumatoid arthritis attending rheumatology opd will be screened for possible entry into the study. After applying inclusion and exclusion criteria informed consent will be taken and the patient will be allowed to participate in the study.

Measurement of autoantibodies (ELISA testing): 1 week

Data Compilation and statistical analysis: 2 weeks

Preparation of manuscript of the study & submission: 1 week