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TRENDS IN THE OCCURRENCE OF ISCHEMIC HEART DISEASE OVER TIME IN RHEUMATOID ARTHRITIS: A RETROSPECTIVE COHORT STUDY FROM NORWAY OF 1821 PATIENTS FROM 1972 TO 2014

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Background: Previous studies have shown that rheumatoid arthritis is associated with a 1.5 to 2.0 times increased risk of acute myocardial infarction (AMI) and ischemic heart disease (IHD) compared with the general population [1,2]. RA treatment has improved vastly over the last two decades, due to the focus on early and aggressive treatment and the use of synthetic and biologic DMARDs. Several studies have documented higher rates of remission and better long-term outcomes in patients with early introduction of DMARDs [3]. This window of opportunity may also be a critical phase for intervention against the development of atherosclerosis in RA. There is little information about the occurrence of AMI and IHD in patients diagnosed after the introduction of modern RA treatment.

Objectives: To evaluate trends of AMI and IHD events in RA patients compared with the general population over time.

Methods: We performed a retrospective cohort study of 1821 RA patients diagnosed from 1972 to 2013. The total population of Hordaland, Norway was used as a comparison cohort. Information on AMI and IHD events was obtained from hospital patient administrative systems or cardiovascular registries during 1972-2014. Aggregated counts of AMI, IHD and population counts of the comparison cohort were used to calculate expected counts of AMI and IHD in the RA cohort per 5-year age group, sex and calendar year. We then used Poisson regression with expected counts as an offset to estimate standardized event ratios (SER) as a measure of excess events.

Results: The difference in events (excess events) in RA patients compared with the general population declined on average 1.3% per year for AMI and 2.3% for IHD from 1972 to 2014. There was no significant excess AMI (SER 1.05, 95% CI 0.85–1.35) and IHD events (SER 1.02, 95% CI, 0.89–1.16) for RA patients diagnosed after 1998 compared with the general population.

Conclusion: RA patients have historically had an excess risk of IHD compared with the general population. Our study did not find excess AMI or IHD events in RA patients diagnosed after 1998. Our findings may reflect improved management of RA, CVD prevention or changes in the case-mix of RA patients over time.

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HIGHER SKIN AUTOFLUORESCENCE IN INDIVIDUALS AT RISK FOR RHEUMATOID ARTHRITIS: RESULTS FROM A LARGE POPULATION BASED COHORT

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Background: Rheumatoid arthritis (RA) is a chronic systemic inflammatory disease which is associated with increased mortality, mostly because of a higher incidence of cardiovascular disease (CVD), which cannot be explained by traditional risk factors alone. (1,2) Also studies showed that the cardiovascular events can already occur at a higher than expected rate shortly after the first symptoms of RA. (3) This raises the question if individuals with clinical suspect arthralgia (CSA) but not yet diagnosed with RA, already have an increased risk for developing cardiovascular disease compared to healthy controls and if this is also true for ACA positive individuals without symptoms of clinical suspect arthralgia. In our study we used skin autofluorescence (SAF), measured with the AGE reader, as an early non-invasive tool to identify subjects who are at increased risk for developing cardiovascular disease. (4) SAF measures the accumulation of AGEs in the skin and thereby offers a simple alternative to invasive measurement of AGE accumulation. (5)

Objectives: To investigate skin autofluorescence (SAF) levels, as an early indicator for cardiovascular disease, in relation to the presence of anticitrullinated
protein antibodies (ACPA), clinical suspect arthralgia (CSA) and rheumatoid arthritis (RA) in a large population-based cohort.

**Methods:** Cross-sectional data were used from 17346 participants of the Dutch Lifelines Cohort Study, of whom baseline SAF and ACPA levels were available. The presence of CSA was determined using EULAR questions from the connective tissue disease screening questionnaire (CSQ). Individuals were divided into four groups: ACPA negative controls (n=17211), ACPA positive without CSA (n=49), ACPA positive with CSA (n=31) and defined RA (n=52). Multinomial regression was used to compare SAF levels and correct for potential confounders.

**Results:** SAF levels were higher in the ACPA positive with CSA group (OR 2.04, p=0.034) and the defined RA group (OR 3.10, p<0.001) compared to controls, but not in the ACPA positive without CSA group (OR 1.07, p=0.875). The difference in SAF levels remained statistically significant in the defined RA group after adjusting for age (OR 2.09, p<0.001), smoking status, renal function or HbA1c. In the ACPA positive with CSA group, the effect was found to be comparable (corrected for age: OR 2.09).

**Conclusion:** Our results indicate that ACPA positive individuals with CSA have elevated SAF levels, which is regarded as an early marker for oxidative stress and a possible indicator for development of cardiovascular disease. Therefore it is important to conduct further studies to explore if, in individuals with clinical suspect arthralgia, cardiovascular risk management should be considered in future clinical practice.

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**Figure 1.** The top chart shows SAF levels measured with the AGE reader in the 4 groups: ACPA negative controls, ACPA positive without CSA group, ACPA positive with CSA group and defined RA group. The lower picture shows the AGE reader we used from DiagnOptics Technologies BV, Groningen, the Netherlands: https://www.diagnoptics.com/