SAT0710

RISK ASSOCIATION FOR ANKYLOSING SPONDYLITIS USING A GENETIC RISK SCORE COMBINING 110 SNPS OF GENOME-WIDE SIGNIFICANCE IN THE POPULATION-BASED HUNT STUDY

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Background: The genetic component of AS development is estimated to ~90%. About 20% of the known heritability for AS is attributed to *HLA-B27* and about 7.4% to 113 SNPs found in genome-wide association studies,¹ with a further ~60% of heritability determined by as yet unmapped variants.

Objectives: To evaluate whether a weighted genetic risk score (wGRS) developed based on the currently identified SNPs is predictive of AS in the Norwegian population-based Nord-Trøndelag Health Study (HUNT).

Methods: HUNT invited the entire adult population of Nord-Trøndelag county. We used data from HUNT2 (1995–97) and HUNT3 (2006–8). AS cases were diagnosed from hospital records using the Modified New York Criteria. Participants with other inflammatory arthritis were excluded, leaving 181 AS cases and 55 586 controls. Genotyping was performed with Illumina HumanCoreExome arrays. Imputation was performed with Minimac3 based on European ancestry data. Imputed or genotyped data were available for 110 (97%) of the 113 SNPs. We used rs4349859 to indicate *HLA-B27* carrier state (positive/negative). The wGRS was calculated by addition of risk alleles and weighting by the published OR from,¹ representing each person's carriage of all risk variants. Data were analysed using logistic regression. Four models were compared using AUC analysis: 1) the wGRS only; 2) *HLA-B27* only; 3) the wGRS and *HLA-B27*; 3) the wGRS, *HLA-B27*, age, gender, BMI, hypertension, and smoking (never/previous/present). HUNT had ethical approval and participants gave informed consent.

Results: At baseline, mean age for cases was 43 years, 61% were men and 87% were *HLA-B27* positive. The corresponding figures for controls were 46 years, 47% men and 12.7% *HLA-B27* positive. The mean wGRS was 14.37 (range: 10.93 to 17.41). The wGRS alone was associated with AS (OR=1.7 for one unit increase, $p<0.001$), but had low discriminative ability (AUC: 0.62, 95% CI: 0.58–0.66). *HLA-B27* alone was also associated with AS (OR=48^{31–74}), $p<0.001$ and showed high discriminative ability (AUC: 0.88 (0.85–0.90)). AUC for the combined wGRS and *HLA-B27* model (0.89 (0.87–0.92)) was higher than for the univariate models ($p<0.001$ vs. wGRS only; $p<0.01$ vs. *HLA-B27* only). Further addition of age, gender, BMI, hypertension, and smoking to the combined model gave a small improvement (AUC: 0.91 (0.88–0.94), $p=0.03$).

Conclusions: The wGRS was associated with AS, but had low predictive ability in a population-based setting. *HLA-B27* was a much better predictor. Addition of clinical variables only slightly improved prediction, in accordance with the high genetic component in AS pathophysiology. Discovery and inclusion of more genetic risk variants, epigenetic factors, other demographic factors, and interaction terms, in addition to more efficient statistical approaches such as genome-wide risk score development, could improve prediction. Study limitations are false positive- or -negative AS diagnoses and potential selection bias of participants in HUNT.

REFERENCE:

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SAT0711

SENSE OF COHERENCE PREDICTS DEVELOPMENT OF CHRONIC WIDESPREAD PAIN OVER TIME

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Background: Chronic musculoskeletal pain is a common condition that has become a great challenge for those affected and for the society. Although much is known about factors that are associated with chronic pain, there is less of knowledge on the influence of salutogenetic factors as measured by sense of coherence (SOC) on pain, especially over time.

Objectives: To investigate the associations between SOC, health status and chronic musculoskeletal pain in a general population followed over 13 years.

Methods: A cross-sectional and longitudinal cohort study, based on a postal survey at baseline 2003 and a follow-up survey in 2016, including a sample of 1850 subjects from the general population. SOC was measured by a short three item

questionnaire, SOC-3. Subjects were divided into three levels of SOC (low, moderate, high). Health status was measured by SF-36. Pain was reported on a pain mannequin with 18 predefined regions, and was categorised into three pain groups; no chronic pain (NCP), chronic regional pain (CRP), and chronic widespread pain (CWP). CWP was defined according to the ACR 1990 criteria for fibromyalgia. The results were controlled for age and gender, and where appropriate also for pain group.

Results: Subjects with high SOC at baseline reported higher mean scores in all eight SF-36 dimensions than those with moderate or low SOC ($p<0.001$ for all dimensions). Those with high SOC also reported a higher prevalence of NCP (66% vs. 34%) and a lower prevalence of CWP (8% vs. 33%) than subjects with low SOC ($p<0.001$). In the long term follow-up a report of high SOC significantly ($p<0.001$) predicted a better outcome with regard to development and persistence of CWP. Subjects with NCP and high SOC at baseline were less likely to report CWP in the thirteen-year follow-up than those with low SOC (3.6% vs. 10%). For those with CWP at baseline, subjects with high SOC more often reported less chronic pain (NCP or CRP) at follow-up compared to those with low SOC (43.5% vs. 20.5%). When controlled for age, gender and pain, there were no significant differences in SF-36 at follow-up for subjects with different level of SOC at baseline.

Conclusions: High level of SOC predicted a lower risk to develop CWP over time, and a better prognosis for those with CWP at baseline. The findings suggest that it would be beneficial to develop methods and make efforts to strengthen SOC, both when meeting patients in the clinic and when making interventions on a national level.

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SAT0712

EVALUATION OF STRUCTURAL DAMAGE IN PSORIATIC ARTHRITIS: A SYSTEMATIC LITERATURE REVIEW

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Background: Measuring structural damage in psoriatic arthritis (PsA) is important since it is the ultimate goal of treatment.¹ Similar to rheumatoid arthritis (RA), structural damage in PsA is evaluated mainly on x-rays, but there is no consensus about the radiologic scoring method to use in trials. Usually scores from RA are used and modified so they can capture PsA specific features, such as distal interphalangeal (DIP) joints involvement, bone proliferation, periostitis, osteolysis etc.²

Objectives: The objective of this study was to analyse existing data on the definition and scoring methods of structural damage in studies on PsA.

Methods: A systematic literature review was performed. Studies evaluating structural damage in PsA were identified in Pubmed/Medline and Embase on 10th December 2017. Several synonyms for the main components (i.e. psoriatic arthritis, structural damage, radiologic progression) were used. No search limits were applied. Studies not assessing structural damage or not providing enough information on the definition of damage were not included, nor reviews, case-reports, letters. Descriptive statistics were used.

Results: In all, 3321 abstracts were identified of which 61 full length articles were included in the final analysis. The majority were observational studies (59%). Only 3 studies were on axial PsA (axPsA) and around 10% of the studies also had a control population, e.g., RA, osteoarthritis, spondyloarthritis and healthy individuals. In total, a median of 220 (minimum-maximum: 12–1077) patients were included. Most of the studies used the CASPAR criteria (63.9%). A wide majority of studies (80.3%) assessed progression of structural damage.

Structural damage was defined mainly radiographically (77%), followed by the clinical definition (24.6%) and to a lesser extent by other investigations: magnetic resonance imaging (8.2%), computer tomography (4.9%) and ultrasound (3.3%), respectively.

Radiologic assessment of peripheral damage included radiographs of hands and feet, but was very heterogeneous, with most of the studies using the scores “borrowed” from RA and modified for PsA. Hence, 97.8% of the studies using the radiographic evaluation of damage have adapted the scoring method so that it includes the DIP joints of hands and feet. The following elements were included in the radiographic scores: space narrowing 42 studies (93.3%), erosions 44 (97.8%), osteolysis 24 (53.3%), proliferation 12 (26.7%), periostitis 9 (20%), tuft resorption 14 (31.1%), pencil in cup 17 (37.8%), juxta-articular osteopenia/osteoporosis 4 (8.9%), subluxation 6 (13.3%), and ankylosis 5 (11.1%) (table 1). In axPsA radiographic damage was defined by sacroiliitis grades and spine damage, i.e., presence of syndesmophytes and scores such as BASRI-spine, mSASSS, RASSS and PASRI.