IDENTIFICATION AND VALIDATION OF PHYSICAL ACTIVITY PHENOTYPES FOR KNEE OSTEOARTHRITIS: A POPULATION-BASED COHORT STUDY

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Background: The identification of phenotypes to reduce heterogeneity of characteristics is important in understanding the development and progression of knee osteoarthritis.

Objectives: This study aimed to identify physical activity (PA) phenotypes and to investigate the association of these phenotypes with tibial cartilage volume, bone marrow lesions (BMLs) and knee replacements (KR).

Methods: 1046 community-dwelling older adults aged 50–80 years were studied. At baseline, PA was measured by pedometers (steps/day), knee pain was assessed using Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and BMI was determined utilising objective weight and height measures. MRI scans were conducted at baseline and 10.7 years to assess tibial cartilage volume and BMLs. The incidence of KR was determined by KOOS (WOMAC) and body mass index (BMI) was determined utilising objective weight and height measures. Linear mixed-effects models were used to estimate the associations between the baseline variables and change in cartilage volume, incident BMLs, worsening knee pain and survival analysis, were used to investigate associations between knee pain and knee OA.

Results: Ten hip shape modes were identified, describing 78% of the total shape variance (Suppl 2):19

<table>
<thead>
<tr>
<th>Satisfaction/Unsatisfaction</th>
<th>Unadjusted</th>
<th>Adjusted</th>
</tr>
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<tbody>
<tr>
<td>Education</td>
<td>0.8 (0.7–0.9)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Income</td>
<td>0.71 (0.64–0.8)</td>
<td>&lt;0.001</td>
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OR − odds ratio, CI − confidence interval

Conclusions: Higher levels of education and income are linked with decreased prevalence of radiographic knee OA. Lack of this association after adjustment suggests confounding or mediating effects of other risk factors. Future studies are needed to delineate the precise mechanisms of how SES impact knee OA.

REFERENCE:

Disclosure of Interest: None declared


SAT0564 EFFECTS OF EDUCATION AND INCOME ON PREVALENCE, INCIDENCE, AND PROGRESSION OF RADIOGRAPHIC KNEE OSTEOARTHRITIS: AN ANALYSIS OF THE OSTEOARTHRITIS INITIATIVE DATA

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Background: Low socioeconomic status (SES) is one of the strongest predictors of morbidity and mortality from many chronic diseases including cardiovascular diseases, obesity, and diabetes. There is insufficient data regarding impact of SES on knee osteoarthritis (OA).

Objectives: To evaluate the associations between education, income levels and prevalence, incidence, and progression of radiographic knee OA

Methods: For the current analysis we used data from the publically available Osteoarthritis Initiative (OAII) database. The education status of the participants was dichotomized into either low/moderate or high educational attainment. The income status was dichotomized using 50 K US threshold. A baseline sample was used to analyse the impact of SES on knee OA prevalence (prevalence sample). To evaluate the effects of SES on knee OA incidence and progression we analysed the samples of OAII participants with KL ≤2 at baseline (incidence sample) and OAII participants with KL ≥3 at baseline (progression sample), respectively.

We used logistic regression models to assess the association between SES and prevalence and incidence of radiographic knee OA (defined as KL2 and JSN or joint replacement), and disease progression (defined as increase in semiquantitative JSN or a new knee replacement). Generalised estimating equations (GEE) were used to adjust for the correlation between knees. The models were adjusted for multiple covariates including age, race, and body mass index.

Results: Prevalence, incidence, and progression samples consisted of 4371 participants (8741 knees), 2268 participants (4535 knees), and 3950 participants (4013 knees), respectively. Higher education attainment and higher income were associated with decreased prevalence of the knee OA in the crude analyses. After adjustment for confounders these associations became insignificant (Table). There was no effect of SES on incidence and progression of knee OA.

Table

Disclosure of Interest: None declared


SAT0565 ADJUSTING FOR THE INTRA-ARTICULAR PLACEBO EFFECT IN KNEE OSTEOARTHRITIS THERAPIES

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Background: Currently, there is a large debate regarding the appropriateness of intra-articular (IA)-saline injection as a “placebo” comparator in knee osteoarthritis (OA) trials and meta-analyses. There is substantial evidence to suggest that the injection of saline into the joint is not without treatment effect.

Objectives: This study aimed to assess the current literature’s estimates of the IA-saline treatment effect against a range of appropriate minimal clinically important difference (MCID) values to identify if IA-saline provides a therapeutic effect that is not indicative of a null-effect.

Methods: The treatment effect estimates of IA-saline and topical placebo for knee OA pain, relative to oral placebo, were derived from a published network meta-analysis Bannuru et al, 2015 and compared across a range of plausible
MCID values. Effect estimates of pharmacologic knee OA treatments were also extracted from recent high-quality meta analyses, and the effect of IA-saline or topical placebo was used as an adjustment for meta-analyses that used IA-saline or topical placebo as a comparator, respectively. This was done to estimate the therapeutic effect of these treatment options when compared to a truly null treatment option, as IA-saline has been shown to not be a null-effect intervention. The unadjusted and adjusted treatment effect values were compared across an MCID value range of 0.2 to 0.5 standard deviation units representing an effect size range. This range was used to determine if the adjustment for the effect of IA-saline would affect the potential clinical interpretation of the previously published meta-analysis results.

Results: IA-saline provides a therapeutic benefit that is potentially clinically meaningful to patients based on a range of MCID values (figure 1). Across the same range of MCID values, the effects of high molecular weight IA-hyaluronic acid products and IA-corticosteroid treatments were not conclusively clinically significant. However, when reassessing these treatments while accounting for the treatment effect of IA saline, they were found to have a clinically significant effect at the strictest MCID value (figure 2).

Abstract SAT0566 – Figure 1. Representative photomicrographs of TRAP-positive osteoclasts and CD68-positive macrophages in subchondral bone.

Figure 1. Effects of Topical Placebo and IA-Saline in Comparison to the MCID Threshold Range

Figure 2. Pain Effect Estimates Adjusted for Placebo Effect Estimate (from Bannuru et al [2015])

Conclusions: The use of IA-saline as a placebo treatment within RCTs of IA injectable therapies is inappropriately underestimating the true effect of these treatments. When the potential therapeutic effect that IA-saline demonstrates is accounted for, these IA therapies show a considerably larger therapeutic effect.

REFERENCE:


*; p<0.05 by Mann-Whitney U test

Abstract SAT0566 – Table 1. Patient demographic data.

Abstract SAT0566 – Table 2. Histopathological characteristics.

ties in patients with knee OA, but the pain pathophysiology is incompletely understood. Recent accumulating clinical evidence indicates that subchondral bone plays a role in generating joint pain in OA. Subchondral bone marrow lesions (BMLs) detected on magnetic resonance imaging (MRI) in knee OA are strongly associated with pain. In human OA histology, bone turnover and osteoclast numbers in subchondral bone were increased. Inflammatory CD68-positive macrophages have been detected in bone marrow compartments of subchondral bone tissue from tibial plateaux of OA knees. However, the relevance of osteoclasts and macrophage infiltration in subchondral bone to knee OA symptoms has not been clarified.

Objectives: To identify osteoclast and macrophage infiltration in subchondral bone associated with symptomatic knee OA, by comparing cases with similar macroscopic chondropathy, half of whom had sought help for knee pain and undergone total knee replacement (TKR) surgery (symptomatic chondropathy), the other half of whom had not sought help for knee pain but had died from unrelated illness (asymptomatic chondropathy).

Methods: Medial tibial plateaux were obtained from people undergoing TKR for OA (symptomatic chondropathy), and from post-mortem (PM) cases matched for similar macroscopic chondropathy scores (asymptomatic chondropathy). Samples were histologically graded for chondropathy, subchondral fibrovascular or macrophage infiltration, and TRAP-positive osteoclasts were quantified (figure 1).

Results: Patient demographics are shown in table 1. Total Mankin score showed similar values between the two groups (Table2). The number of osteoclasts in symptomatic chondropathy cases was significantly higher than in asymptomatic chondropathy cases (table 2). This difference remained significant (p<0.05) after adjusting for age by logistic regression analysis. However, there was no significant difference in macrophage densities between symptomatic and asymptomatic chondropathy groups (Table 2).