(0.45mm) CT scans. Cortical bone thickness (mm) and trabecular bone density (Hounsfield units, HU) were measured with an automated algorithm. Osteophytes were excluded. Afterwards, wxRegSurf v18 was used for surface registration. Registration data was used for bone shape measurements. MATLAB R2020a and the SurfStat MATLAB package were used for data analysis and visualization. Two-tailed F-tests were used to calculate changes over time. Two separate linear regression models were used to show the influence of baseline Kellgren-Lawrence grade and sex on the changes over time. Statistical significance was calculated with statistical parametric mapping; a p-value <0.05 was considered statistically significant. Bone shape changes were explored visually using vertex by vertex displacements between baseline and follow-up. Patients were separated into two groups based on whether their most affected compartment (MAC) was medial or lateral. Only patients with axial CT scans at both time points available for analysis were included for evaluation.

Results: 3 Patients did not have complete CTs and in 1 patient the imaged femur was too short, leaving 16 patients for tibial analyses and 15 patients for femoral analyses. The MAC was predominantly the medial side (medial MAC n=14; lateral n=2). Before treatment, the MAC cortical bone was compared to the rest of the joint (Figure 1). One year after treatment, MAC cortical thickness decreased, although this decrease of up to approximately 0.25mm was not statistically significant. The trabecular bone density was also higher before treatment in the MAC, and a decrease was seen throughout the entire joint, although statistically significant only for small areas on mostly the MAC where this decrease was up to approximately 80 HU (Figure 1). Female patients and patients with a higher Kellgren-Lawrence grade showed a somewhat larger decrease in cortical bone thickness. Trabecular density decreased less for patients with a higher Kellgren-Lawrence grade, and female patients showed a higher density decrease inferiorly while male patients showed a higher decrease exteriorly. None of this was statistically significant. The central areas of both compartments showed an outward shape change, while the outer ring showed inward changes.

Conclusion: MAC cortical bone thickness shows a partial decrease after KJD. Trabecular bone density decreased on both sides of the joint, likely as a direct result of the bicompartamental unloading. For both subchondral bone parameters, MAC values became more similar to the LAC, indicating (partial) subchondral bone normalization in the most affected parts of the joint. The bone shape changes may indicate a reversal of typical OA changes, although the inward difference that was seen on the outer edges may be a result of osteophyte-related changes that might have affected the bone segmentation. In conclusion, KJD treatment shows subchondral bone normalization in the first year after treatment,

and longer follow-up might show whether these changes are a temporary result of joint unloading or indicate more prolonged bone changes.

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POS1093

KNEE AND HIP OSTEOARTHRITIS ARE ASSOCIATED WITH SUBCLINICAL AND MANIFEST ATHEROSCLEROSIS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: An association between osteoarthritis (OA) and atherosclerosis (AT) has long been suggested, with its plausibility based on several guessed commonalities, from shared risk factors to overlapping molecular pathways, given that both conditions represent a state of chronic low-grade inflammation. However, meta-analyses of the impact of OA on hard cardiovascular (CV) endpoints have displayed conflicting results. Those disparate results probably stemmed from the heterogeneous OA population adjoined, as it has been postulated that OA denotes not a single, but a group of diseases with particular pathogenic mechanisms. Also, CV mortality may capture just the extreme of a continuum of atheromatous burden, and miss earlier subclinical disease.

Objectives: In order to discern a more refined association between OA and AT, a systematic review and a meta-analysis of studies that focused on OA of weight-bearing joints (i.e., hip and knee) were performed, and the results stratified by clinical and subclinical AT.

Methods: A search on PubMed, Web of Science, LILACS, and SciELO from inception until August 2020, was done using the MeSH search terms "osteoarthritis", "aorta", "carotid", "intima-media thickness", "coronary artery disease", "atherosclerosis", "cardiovascular disease", and "death". To appraise the quality of the studies, we applied the Newcastle-Ottawa scale. To assess for heterogeneity, I^2 was used. A random-fixed effect model was adopted, and outliers were excluded when detected. Publication bias was ascertained qualitatively by funnel plot, and quantitatively by Egger regression test. Analyses were performed on RStudio version 1.3.1093.

Results: The search retrieved 1335 citations, of which 168 were screened for abstract reading. From those, 127 were selected for full-text reading. After exclusion of duplicates and out of scope articles, a total of 23 studies, comprising 151,187 individuals with OA and 287,444 controls, were included on the narrative synthesis, and 17 on the meta-analysis. All but one study were deemed as of fair or good quality. Fifteen studies found a positive association between OA and AT, the remaining 8 did not reach statistical significance. Four studies subdivided the OA patients by gender, and in half of those a positive association was found exclusively on females. Thirteen studies worked with a subclinical definition of AT, 1 included both subclinical and manifest disease, and the remainder included only manifest disease. Hip and knee OA increased the risk for both subclinical AT (OR 1.15, 95% CI 1.01-1.31, Figure 1A), and CV disease (OR 1.13, 95% CI 1.05-1.22, Figure 1B), but not for CV death (OR 1.08, 95% CI 0.99-1.19).

Conclusion: Hip and knee OA are associated with AT. This may have practical implications on the management of OA patients, as a more intensive control of traditional CV risk factors may be advised.

Figure 1. Forest plots showcasing the association between hip and knee OA and subclinical AT (A) and CV disease (B).

Cortical bone thickness

Trabecular bone density

Figure 1: The average cortical bone thickness (top) and trabecular bone density (bottom) of all patients whose medial compartment was the most affected at baseline (left) and one year after treatment with knee joint distraction (mid). On the right a difference map between the two time points is shown; blue indicates an increase and red a decrease. Statistically significant changes are indicated by the darker color map ($p < 0.05$) while non-significant areas are shown with faded colors ($p > 0.05$). For the trabecular bone density, the cortical bone thickness did not show statistically significant differences.

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POS1094

SYNOVITIS IS FACTOR OF OSTEOARTHRITIS KNEE PROGRESSION IN PATIENTS WITH LESS THAN 5 YEARS OF DISEASE DURATION

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Background: There are many studies about investigation of risk factors (RF) of knee osteoarthritis (OA) radiologic progression. Especially, in patients with small disease duration. At the moment, there are ambivalent of results of previous studies, lead to uncertain role of synovitis.

Objectives: The aim of study is to investigate relationship between knee OA synovitis and progression risk in patients with small disease duration during a follow-up period of 5 years.

Methods: Eligible patients had knee OA based on ACR criteria with x-ray confirmation; baseline (BL) disease duration less than 5 years. Patients were evaluated at BL and at 5-year follow-up, using the questionnaires, clinical examination, knee joints pain by visual analog scale (VAS), musculoskeletal ultrasound and X-ray. Unadjusted p-values are presented.

Results: Among 52 adults with knee OA (mean age $\pm$ standard deviation, 59.11 $\pm$ 8.95 years; 100% female) had the proportion of patients at BL 42.3% (n=22), 46.2% (n=24), 11.5% (n=6) by disease stage 1, 2 and 3, respectively. Patients were categorized into 2 groups by progression during 5 years from BL based on changes of radiological stage. After 5-years follow-up period the progression of knee OA was established in 14 patients (1 group) and in 38 patients (2 group) the progression by radiological stage was absent. BL patients' characteristics were similar across 1st and 2nd groups: mean age 58.29 $\pm$ 7.68 vs 56.05 $\pm$ 8.74, p>0.05; disease duration 3.43 $\pm$ 1.34 vs 3.47 $\pm$ 1.33, p>0.05. Individuals with knee OA progression had worse knee joints pain during walking (60.36 $\pm$ 18.33 vs 48.71 $\pm$ 17.81, p=0.043), higher body mass index (BMI) (34.45 $\pm$ 4.60 vs 28.92 $\pm$ 4.92 kg/m², p=0.001), higher frequency of knee synovitis by clinical examination (42.9% vs 10.5%, RR=4.07; 95%CI (1.3-12.3), p=0.01) and by musculoskeletal ultrasound (57.1% vs 18.4%, RR=3.1; 95%CI (1.38-6.96), p=0.009). At 5-years follow-up knee pain was significantly greater for 1st group (69.64 $\pm$ 18.49 vs 55.76 $\pm$ 12.76, p = 0.003), higher BMI (35.74 $\pm$ 5.83 vs 30.64 $\pm$ 4.64, p = 0.002), also higher frequency of knee synovitis by clinical examination (57.1% vs 10.5%, RR = 5.4 (95%CI 1.9-15.2), p=0.001) and by musculoskeletal ultrasound (50% vs 13.2%, RR=3.8 (95%CI 1.4-10.0), p=0.009). Spearman correlation coefficients between radiologic stage and OA progression factors were indicated: between radiologic stage and knee pain during walking (r = 0.34, p<0.05), BMI (r = 0.46, p<0.01), knee synovitis by musculoskeletal ultrasound (r = 0.41, p<0.01). Multivariate (discriminant) analysis was determined that synovitis is a significant predictor of radiographic progression (p < 0.05).

Conclusion: The proportion of patients with knee synovitis by clinical examination and musculoskeletal ultrasound data increased by 5-year follow-up from BL. Synovitis is a significant predictor of radiographic progression of knee OA in patients with small disease duration.

Disclosure of Interests: None declared.

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Figure 1.

POS1095

FOOD SOURCES OF DIETARY FIBRE AND RISK OF TOTAL KNEE REPLACEMENT RELATED TO SEVERE OSTEOARTHRITIS, THE SINGAPORE CHINESE HEALTH STUDY

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Background: Although fibre intake was inversely associated with the risk of symptomatic knee osteoarthritis (KOA) in a US study, this association was partially confounded by lower body mass index (BMI) in those with higher fibre intake.

Objectives: We evaluated the association between fibre intake and its food sources, and the risk of total knee replacement (TKR) due to severe KOA.

Methods: We used data from the Singapore Chinese Health Study, a prospective cohort study that recruited 63,257 participants aged 45-74 years from 1993 to 1998. At baseline, we assessed diet using a validated 165-item semi-quantitative food frequency questionnaire, together with BMI and lifestyle factors. Incident TKR cases were identified via record linkage with nationwide hospital discharge database through 2017. We used multivariable Cox regression models to compute hazard ratio (HR) and the corresponding 95% confidence interval (CI) for risk of TKR.

Results: There were 2,816 cases of incident TKR due to severe KOA. Total fibre intake at baseline was not associated with risk of TKR after adjustment for confounders. Among the food sources of fibre, higher intake of legumes was associated with lower risk of TKR in dose-dependent manner; compared with those having the lowest quartile intake, HR (95% CI) was 0.86 (0.76, 0.96) for the highest quartile (p for trend = 0.004). This association was consistent after including BMI in the model, and homogenous across BMI categories. The consumption of other fibre sources, namely grain products, nuts and seeds, soy food, fruits and vegetables, was not associated with risk of TKR.

Conclusion: Intake of legumes, but not total fibre, was associated with a reduced risk of TKR. Further research is needed to replicate our findings, and to evaluate possible biological mechanisms that could explain the effect of dietary legumes in pathogenesis or progression of KOA.

Table 1. Hazard ratios (95% confidence intervals) for risk of total knee replacement according to intake of fibre (only shown total fibre and legumes): The Singapore Chinese Health Study (1993-2017).

Quartiles of energy-adjusted food intake	Q1	Q2	Q3	Q4	p for trend ¹
Total fibre					
Median, g/day	8.55	9.43	12.19	17.70	
Cases/ person-years	528/ 275,050	712/ 280,456	767/ 284,394	809/ 287,955	
Multivariate Model 1	1.00	1.08 (0.96, 1.21)	1.12 (1.00, 1.26)	1.18 (1.05, 1.32)	0.003
Multivariate Model 2	1.00	1.06 (0.95, 1.19)	1.09 (0.97, 1.22)	1.11 (0.99, 1.24)	0.088
Legumes					
Median, g/day	0.11	0.43	2.11	7.01	
Cases/ person-years	638/ 280,170	754/ 278,001	756/ 280,407	668/ 289,275	
Multivariate Model 1	1.00	0.97 (0.87, 1.09)	0.95 (0.84, 1.06)	0.84 (0.76, 0.94)	<0.001
Multivariate Model 2	1.00	0.98 (0.87, 1.09)	0.94 (0.84, 1.06)	0.86 (0.77, 0.96)	0.004
Multivariate Model 3	1.00	0.98 (0.87, 1.09)	0.95 (0.84, 1.06)	0.86 (0.76, 0.96)	0.004

¹Linear trend was tested by assigning to participants the median value of the quartile and treating this as a continuous variable. ²The grain products included noodles and pasta, rice, bread and pancakes, breakfast cereals, biscuits and crackers. Multivariate model 1: adjusted for age at interview, sex, year of interview, total energy intake, dialect, education level. Multivariate model 2: model 1 plus BMI, sitting duration, sleep, physical activity, smoking, history of hypertension, diabetes, coronary artery disease and stroke. Multivariate model 3: model 2 plus grain products, legumes, nuts and seeds, soy food, fruits and vegetables. Q = quartile

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