Title

Clinical Changes In Knee Osteoarthritis (Koa) Patients Exposed To An Anti-Inflammatory (Itis)-Diet

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Publication Date

2023-03-01

DOI

10.1016/j.joca.2023.01.167

distance walking activity, one of the required abilities for people to "move around". The walking activity is commonly affected in people with Knee osteoarthritis (KOA), a chronic-degenerative joint disease, frequent among individuals aged 40 years or more. The progression of KOA pain impacts directly on physical function and, therefore, on gait efficiency. Inadequate Body Mass Index (BMI) also has a relation with physical disability. In addition, sarcopenia, characterized as loss of strength and skeletal muscle mass, is associated with reduction of independence in activities of daily living and in gait speed of older adults. Kinesiophobia may contribute to decline on gait speed since excessive attention to pain causes loss of complexity and adaptability of gait in people with musculoskeletal conditions. Faced with several factors that relate to gait speed decline in people with KOA, it is important to determine which factors most impact on gait speed during short distance walking, an important daily live activity. Thus, the aim of this study was to investigate if there is association between gait speed and pain intensity, BMI, sarcopenia, age and kinesiophobia in patients with KOA.

Methods: This is a secondary analysis of previous studies with KOA individuals of the Laboratory of Analysis of Articular Function (LAFAR) of Federal University of São Carlos - Brazil. Participants clinically and radiographically diagnosed with KOA, of both sexes, aged ≥40 years, with BMI <30 kg/m2 were included in the study. Participants answered Tampa Questionnaire of Kinesiphobia and graded pain intensity on a Numerical Scale of Pain. They underwent the 40mWalkTest and whole-body Dual Energy X-ray Absorptiometry (DXA, Discovery A, Hologic, Bendford, MA). To assess short distance gait speed, a 10 meters walkway was marked out with tape at each end. Cones have been placed 2 meters before the start mark and 2 meters beyond the finish mark. To perform the 40mWalkTest, participants were instructed to walk as quickly as possible, but safely and without running along 10 m walkway. They were instructed to turn around a cone, return, and repeat the walk again for total of four times. The time of walking between cones was recorded when participants walked between start and finish marks. To calculate the gait speed, the distance of 40 meters was divided by the time (in seconds) recorded for each participant. For image acquisition by DXA, participants lied in supine position without moving during the measurement. The scanning was performed according to the manufacturer's recommendations. To establish sarcopenia, relative lean mass was calculated using height and appendicular (arms and legs) lean mass acquired by DXA equipment. To calculate relative lean mass, index appendicular lean mass was divided to height squared (ALM/ht^2). If relative lean mass was below cut points previously reported (5.45 kg/ht^2 for women and 7.26 kg/ht^2 for men), the participants were classified as sarcopenic. BMI was calculated through anthropometric data such as weight and height. The Statistical Software Package for Social Science 21.0 version (SPSS Inc, Chicago, IL) was used to perform statistical analyses. To analyze the association between gait speed (40mWalkTest) (dependent variable) and pain intensity, BMI, sarcopenia, age and kinesiophobia (independent variables), a backward multiple linear regression model was used. For all analysis the significance level was set at 5%.

	B	SE B	β	*p*	R^2	Adjusted R^2
Model 1					0.233	0.216
Constant	2.877	0.224		0.000		
Pain intensity	-0.042	0.010	-0.256	0.000		
Age	-0.010	0.002	-0.332	0.000		
kinesiophobia	-0.002	0.002	-0.048	0.421		
BMI	-0.016	0.007	-0.138	0.033		
Sarcopenia	-0.062	0.061	-0.066	0.311		
Model 2					0.230	0.217
Constant	2.811	0.208		0.000		
Pain intensity	-0.043	0.010	-0.261	0.000		
Age	-0.010	0.002	-0.333	0.000		
BMI	-0.015	0.007	-0.138	0.034		
Sarcopenia	-0.068	0.061	-0.071	0.188		

Table 1 Osteoarthritis and Cartilage

Linear regression model explaining gait speed in 40mWalkTest

	B	SE B	β	*p*	R^2	Adjusted R^2
Model 3					0.226	0.216
Constant	2.743	0.199		0.000		
Pain intensity	-0.044	0.010	-0.266	0.000		
Age	-0.011	0.002	-0.346	0.000		
BMI	-0.012	0.007	-0.108	0.067		

Table 2 Osteoarthritis and Cartilage

Final model explaining gait speed in 40mWalkTest

Results: Two hundred and thirty-three participants were included in the study. The mean age ± standard deviation of the participants was 55.6 ± 9.8 years; mean BMI was 26.8 ± 2.7; 62.7% were female. Table 1 describes the variability of gait speed in 40WalkTest in contrast to pain intensity, BMI, sarcopenia, age and kinesiophobia. The final model (model 3) indicated that age, pain intensity and BMI were able to explain 22% of gait speed in 40mWalkTest. However, BMI was not statistically significant (p>0.05). If BMI and pain intensity are stable, the age predicts 35% of gait speed in 40mWalkTest (p < 0.001). When age and BMI are stable, pain intensity predicts 27% of gait speed in 40mWalkTest (p<0.001).

Conclusions: Gait speed in short distance walking activity was associated with pain intensity, age, and BMI in people with KOA. Sarcopenia and kinesiophobia did not associate with this daily activity. These results indicated that, although advancing age is a non-reversible factor, strategies to reduce BMI and pain intensity for people with KOA can impact significantly on gait efficiency and, therefore, on the ability for people to "move around".

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CLINICAL CHANGES IN KNEE OSTEOARTHRITIS (KOA) PATIENTS EXPOSED TO AN ANTI-INFLAMMATORY (ITIS)-DIET

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Purpose: Osteoarthritis (OA) is the most common form of arthritis. Currently, there is no effective medical disease modifying therapy available for OA. Given that currently no effective OA treatment is available, OA patients often seek additional sources of relief and/or treatments with less side effects, and often inquire about dietary modification to improve OA symptoms, as they perceive changes in pain and/or swelling after consumption or avoidance of certain foods. A diet-induced weight loss intervention improved physical function and pain. Yet, losing and specially maintaining weight loss is challenging. Prior randomized controlled clinical trial (RCT) evidence supported beneficial effects of anti-inflammatory micronutrients on pain and physical function in KOA. We propose that a novel, distinct nutritional intervention to decrease pain independent of weight loss might represent a more realistic dietary approach for those suffering from OA.

Methods: Patients with a diagnosis of knee OA (KOA) with a visual analogue pain knee score of between 20-80 during the last 7 days, and without changes in therapy during the previous 3 months were offered a 4-week anti-inflammatory diet and recruited in our study. This diet comprises of ingredients that increase omega-3/6 ratio, anti-inflammatory species such as turmeric, anti-oxidants, and prebiotics and probiotics. It also eliminates pro-inflammatory ingredients such as lactose, gluten and red meat. In their first visit (day -14), we established their clinical and biological baseline. In their second visit (at day 0) we collected clinical parameters. Patients were given instruction of how to follow the diet and were asked to follow a daily diet log. In their third visit (at day 28), we evaluated study feasibility outcomes, diet adherence and clinical parameters. Assessments by visual analog pain scale

	D-14 (Visit 1)	D0 (Visit 2)	D+28 (Visit 3)	P	R/NR
VAS Pt	4.06±2.34	4.31± 2.53	2.85± 1.38	**0.044**	11/7
VAS Overall	4.35±2.19	4.12±2.58	2.96±1.70	**0.02**	9/9
WOMAC Pain	11.85±3.44	11 ± 3.24	9.79 ± 3.60	0.089	4/13
WOMAC Stiffness	4.44±1.48	4.65 ± 1.8	3.53 ± 1.66	**0.017**	4/13
WOMAC Activity	37.59±10.92	37.29 ± 12.71	30.65 ± 14.58	**0.019**	6/11
WOMAC Total	53.88±13.44	52.94 ± 16.62	43.97 ± 18.94	**0.016**	6/11
PainDETECT	12.94±7.52	14.28 ± 7.19	10.67± 6.40	0.091	7/11
Sleep Quality	22.39±9.63	22.00 ± 8.04	19.39 ± 6.31	**0.05**	5/13
PASE Walking	21.29±18.40		32.29± 31.86	0.06	8/10
BMI	31.76±8.78	33.97±9.87	32.44 ± 8.37	0.18	10/3

Table 1

Osteoarthritis and Cartilage

Clinical Characteristics of OA patients at 3 different time points (N=18)

(VAS) of pain and patient global disease severity, and Western Ontario and McMaster Universities Arthritis Index (WOMAC), PROMIS sleep disturbance, the Physical Activity Scale for the Elderly (PASE), and the painDETECT questionnaires were collected in the three visits. Trend in clinical changes were examined between the three time points. Patients were also classified as responders if they improved at least 30% after ITIS diet intervention. Statistical analysis was performed in R.

Results: In an ongoing clinical trial, 18 KOA (50% women, age average: 63.7, standard deviation (SD): 8.6), BMI average 32.5 (8.7)), were recruited and went through the complete trial. Several clinical outcomes including pain, overall disease severity, WOMAC index and sleep scores, were significantly lower after the 4-week anti-inflammatory diet (table 1). Eleven participants were classified as responders to pain and 9 to patient disease severity VAS. Seven patients improved their painDETECT score while 6 patients improved their WOMAC index score. Importantly, 8 patients improved PASE_walking score. Dietary intervention was well tolerated. A diet index score (212 = gold standard) showed a good diet adherence (-138.6 (40.1) vs 99.9 (32.3), p<0.001, for before and after diet trial respectively). Adherence to vegetables and fruits based on the self-reported diaries was approximately 70%, but adherence to except for plant protein and probiotics, was lower, with final average scores less than 60% of the gold standard. Adherence to probiotics such as yogurt and miso, and green tea was lower, with a final average score of less than 60% of the gold standard.

Conclusions: Modulating diet has the possibility to complement medication and improve quality of life for KOA patients. Here we showed that KOA patients are motivated and followed the diet with good adherence. Further studies are needed to provide insight into specific long-term dietary interventions or supplements as dietary treatment to OA.

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DOES AN IMPROVEMENT IN PAIN AND FUNCTION SCORES MEAN A SUCCESSFUL OUTCOME AFTER ARTHROSCOPIC PARTIAL MENISCECTOMY?

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Purpose: A 10-point improvement in the Knee Injury and Osteoarthritis Score (KOOS) is often used to define a successful outcome in clinical studies. This measure alone, however, may be too simplistic. This study's purpose was to demonstrate the relationship between baseline KOOS and the change in KOOS with regards to patient satisfaction.

Methods: 828 patients undergoing arthroscopic partial meniscectomy with baseline and 1-year KOOS and reported satisfaction at 1-year, PASS (Patient Acceptable Symptom State), were included. The probability of satisfaction was estimated for progressively increasing levels of baseline pain and function scores and different magnitudes of 1-year improvement. These probabilities were calculated using the coefficients from logistic regression models for pain and function with PASS as the outcome and KOOS (both baseline and change) as the primary predictors controlling for significant baseline demographic and MRI predictors of satisfaction.

Results: Of the 828 subjects (mean age: 58.2 years, 49.5% female), 561 (68%) reported being satisfied at 1-year. For both pain and function, the baseline KOOS and the change in KOOS were important predictors of satisfaction as was the interaction between the two. The odds of satisfaction were 1.67 times higher for pain and 2.13 times higher for function with every 10-point increase in the baseline score and 2.07 times higher for pain and 4.4 times higher for function with every 10-point improvement in the 1-year score. When baseline pain and dysfunction were mild, the probability of being satisfied was very high even with less than a 10-point improvement. When baseline pain and