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FRI0412

DOES SEVERE ACUTE POSTOPERATIVE PAIN RESULT IN MORE LONG-TERM PAIN AFTER TOTAL HIP OR KNEE ARTHROPLASTY (THA OR TKA) FOR OSTEOARTHRITIS?

D. A. J. M. Latijnhouwers¹, C. H. Martini², R. G. H. H. Nijssen¹, H. M. J. Van der Linden¹, T. P. M. Vliet Vlieland³, M. G. J. Gademan⁴. ¹Leiden University Medical Center, Department of Orthopaedic Surgery, Leiden, Netherlands; ²Leiden University Medical Center, Department of Anesthesiology, Leiden, Netherlands; ³Leiden University Medical Center, Department of Orthopaedics, Rehabilitation and Physical Therapy, Leiden, Netherlands; ⁴Leiden University Medical Center, Department of Orthopaedic Surgery and Clinical Epidemiology, Leiden, Netherlands

Background: Chronic pain is a frequently reported unfavourable outcome of total hip and knee arthroplasties (THA/TKA) (7-23% and 10-34%, respectively) in osteoarthritis (OA) patients (1), which is difficult to treat as underlying mechanisms are not fully understood. Acute postoperative pain has been identified as risk factor for development of long-term pain in other surgical procedures, such as mastectomy and thoracotomy (2). However, the effect of acute postoperative pain on development of long-term pain in THA and TKA patients is unknown.

Objectives: To investigate if acute pain following THA/TKA in OA patients is associated with long-term pain and if acute pain affects the course of pain up to 1-year postoperatively.

Methods: From a longitudinal multicenter study, OA patients scheduled for primary THA or TKA were included. Acute pain scores, using Numeric Rating Scale (NRS), were routinely collected as part of standard care (≤ 72 hours after surgery). In case of ≥ 2 NRS scores the two highest scores were averaged ($n=160$), else the single score was taken. Pain was dichotomized into severe ($NRS \geq 5$) and mild ($NRS < 5$). Pain was assessed preoperatively, at 3 (only THA), 6 and 12 months postoperatively using HOOS/KOOS subscale pain. Separate mixed-effect models for THA and TKA patients were used, with dichotomized acute pain as fixed-effect and long-term pain as outcome, while adjusting for confounders (age, sex, BMI, preoperative pain, mental component scale of the SF12 (MCS-12), and duration of the surgery and hospitalization). We included an interaction between time of measurement and acute postoperative pain to analyse whether effect modification was present. Missing values in preoperative pain and MCS-12 were imputed using multiple imputation methods.

Results: 81 THA and 87 TKA patients were included, of whom 32.1% and 56.3% reported severe acute pain. The results did not show an association between severe acute pain and long term pain (THA: $\beta=2.0$, 95%-CI: -10.9-7.0; TKA: $\beta=3.8$, 95%-CI: -10.6-2.9). Furthermore, it seems that there is no effect present of difference in severity of acute pain and the course of pain over time (THA 6-months: $\beta=6.4$, 95%-CI: 1.9-10.9 and 12-months: $\beta=0.2$, 95%-CI: -4.4-4.8; TKA 12-months: $\beta=3.2$, 95%-CI: -0.5-6.8).

Conclusion: We did not find an association between acute pain and the development of long-term pain nor that severity of acute pain affects the course of postoperative pain in THA and TKA patients. The fact that THA and TKA patients often experience chronic preoperative pain might be a possible explanation for this finding. Nonetheless, future studies including additional measures of acute pain and pain sensitization in patients with chronic preoperative pain are necessary to draw stronger conclusions.

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W.C.M. Marijnissen, Albert Schweitzer Hospital, Dordrecht; P.J. Damen, Waterland Hospital, Hoorn; the Netherlands

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FRI0413

THE ASSOCIATION OF OBESITY WITH OSTEOARTHRITIS IS LIMITEDLY MEDIATED BY HYPERTENSION AND SUBCLINICAL ATHEROSCLEROSIS

M. Loef¹, R. J. Van der Geest², H. J. Lamb², R. De Mutser³, F. Rosendaal³, M. Kloppenburg¹. ¹LUMC, Rheumatology, Leiden, Netherlands; ²LUMC, Radiology, Leiden, Netherlands; ³LUMC, Clinical Epidemiology, Leiden, Netherlands

Background: Obesity-related metabolic dysregulation may lead to atherosclerotic vascular changes. It has been hypothesized that a compromised blood flow may cause detrimental changes to the subchondral bone and decrease nutrient supply to the cartilage. To which extent atherosclerosis may explain the association between obesity and OA has not been investigated.

Objectives: To investigate the role of hypertension and subclinical atherosclerosis (carotid intima-media thickness (IMT), popliteal vessel wall thickness (VWT), aortic pulse wave velocity (PWV)) as mediators of the association of obesity with hand and knee OA.

Methods: We used cross-sectional data from the population-based NEO study, excluding participants with concomitant rheumatic diseases ($n = 323$), resulting in 6,334 participants. Clinical hand and knee OA were defined by the ACR classification criteria. Popliteal VWT was assessed on MR images in a subpopulation ($n = 1,095$), using VesselMASS for semi-automated detection of the vessel wall boundaries. Aortic PWV was estimated on abdominal velocity-encoded MR images in a subpopulation ($n = 2,580$). Carotid IMT was assessed by ultrasonography. Hypertension was defined as a systolic blood pressure ≥ 130 mmHg or a diastolic blood pressure ≥ 85 mmHg, or using antihypertensive medication. Continuous variables were standardized (mean 0, standard deviation 1). Associations between BMI and OA were assessed with logistic regression analyses, adjusted for age, sex and education. Subsequently, possible mediators were added to the model and the percentage mediation was calculated.

Results: The population consisted of 55% women, with a mean (SD) age of 56 (6) years and BMI of 26 (4) kg/m². Hand OA was present in 8% and knee OA in 10% of participants. Hypertension was present in 61.6% of participants. Mean (SD) carotid IMT was 0.62 (0.09) mm, popliteal VWT was 0.53 (0.05) mm, and aortic PWV was 6.56 (1.30) m/s. BMI was associated with the presence of hand OA and knee OA (table 1). BMI was positively associated with hypertension and carotid IMT, but not with popliteal VWT and aortic PWV. The association between BMI and hand OA was partially mediated by hypertension (5.9%) and carotid IMT (10.6%). Hypertension (4.9%) showed a weak mediating effect for the association between BMI and knee OA.

Table 1. Mediation of the association of BMI with OA by hypertension and atherosclerosis

	Hand OA OR (95% CI)	Mediator OR/ β (95% CI)	Hand OA OR (95% CI)	Mediation % (95% CI)
BMI	1.21 (1.08; 1.36)	1.72 (1.56; 1.90)	1.20 (1.06; 1.36)	5.9 (3.4; 17.4)
Hypertension			1.15 (0.82; 1.60)	
BMI	1.21 (1.08; 1.36)	0.23 (0.19; 0.27)	1.19 (1.05; 1.34)	10.6 (6.2; 30.5)
Carotid IMT			1.09 (0.94; 1.25)	
BMI	1.56 (1.17; 2.08)	0.01 (-0.06; 0.09)	1.55 (1.16; 2.07)	0.5 (0.3; 1.7)
Popliteal VWT			1.14 (0.84; 1.55)	
BMI	1.41 (1.15; 1.73)	0.05 (-0.01; 0.11)	1.41 (1.15; 1.73)	0.7 (0.4; 2.0)
Aorta PWV			1.04 (0.81; 1.33)	

	Knee OA OR (95% CI)	Mediator OR/ β (95% CI)	Knee OA OR (95% CI)	
BMI	1.46 (1.32; 1.62)	1.70 (1.55; 1.87)	1.43 (1.29; 1.59)	4.9 (3.7; 7.0)
Hypertension			1.25 (0.93; 1.67)	
BMI	1.46 (1.32; 1.62)	0.24 (0.20; 0.27)	1.47 (1.33; 1.62)	-1.6 (-2.4; -1.2)
Carotid IMT			0.97 (0.86; 1.09)	
BMI	1.20 (0.88; 1.64)	0.03 (-0.04; 0.11)	1.21 (0.89; 1.64)	-0.5 (-7.4; 13.3)
Popliteal VWT			0.95 (0.74; 1.24)	
BMI	1.37 (1.12; 1.67)	0.05 (-0.00; 0.11)	1.37 (1.12; 1.67)	-0.5 (-1.8; -0.3)
Aorta PWV			0.96 (0.76; 1.21)	

Results are based on analyses weighted towards the BMI distribution of the general population ($n = 6,334$). Analysis regarding popliteal VWT ($n = 1,095$) and aorta PWV ($n = 2,580$) were assessed in a subpopulation. Continuous variables were standardized (mean 0, SD 1), SD BMI = 4.41, SD carotid IMT = 0.09, SD popliteal VWT = 0.05, SD aorta PWV = 1.30.