

### 523 IS SERUM LEVEL OF 25-HYDROXYVITAMIN D ASSOCIATED WITH THE RISK OF HIP REPLACEMENT FOR OSTEOARTHRITIS? RESULTS FROM A PROSPECTIVE COHORT STUDY

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**Purpose:** Evidence is conflicting for the association between serum 25-hydroxy-vitamin D[25(OH)D] concentrations and risk of hip osteoarthritis. The aim of this prospective cohort study was to determine whether serum 25(OH)D concentrations were associated with the incidence of hip replacement for osteoarthritis.

**Methods:** This study examined 9,135 participants from the Australian Diabetes, Obesity and Lifestyle Study who had serum 25(OH)D measured in 1999–2000 and were aged  $\geq 40$  years at the commencement of hip replacement data collection. The incidence of hip replacement for osteoarthritis during 2002–2011 was determined by linking cohort records to the Australian Orthopaedic Association National Joint Replacement Registry. The association between serum 25(OH)D and incidence of hip replacement for osteoarthritis was estimated by hazard ratio [HR, 95% confidence interval (CI)] with age as the time-scale. Since a sex interaction was identified, all analyses were stratified by sex and adjusted for body mass index, smoking status, ethnicity, physical activity, season of blood collection, latitude, area-level disadvantage, diabetic status and hypertension.

**Results:** Over an average 9.1 (SD 2.7) years of follow-up, 90 males and 111 females had hip replacements for osteoarthritis. In males, a one SD increase in 25(OH)D concentrations was associated with a 25% increased incidence of hip replacement for osteoarthritis (HR 1.25, 95% CI 1.02, 1.56), with a dose response relationship observed by quartiles of 25(OH)D concentration (P for trend 0.04). No significant association was

knee OA occurred in isolation. The aim of this study is to document the prevalence of foot pain and foot pain laterality in people with knee osteoarthritis (OA), and to examine its impact on health and function.

**Methods:** Participants from the Progression subcohort (n=1255, aged 45–79 years) of the Osteoarthritis Initiative with symptomatic tibiofemoral knee OA were included. Prevalence of foot pain, defined as pain in the foot/ankle, and foot pain laterality referenced to the most affected knee, was determined. Health status was evaluated using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), the Short Form-12 (SF-12) and the Centre for Epidemiological Studies Depression (CES-D) Scale. Function was assessed using the 20-meter walk test (20MWT) and a repeated chair stand test. Differences in health and functional measures were compared between groups with and without foot pain using multivariate analysis of covariance adjusting for age, gender, BMI, KL grade and co-morbidities. All data for these analyses are from the OAI public use data sets.

**Results:** One quarter (n=317, 25%) of people with knee OA experienced concurrent foot pain and these people scored worse on all health measures and on the 20MWT compared to those without foot pain (p<0.05) (Table 1). Subgroup analyses revealed the majority experienced pain in both feet (n=174, 55%) or in the ipsilateral foot (n=87, 27%). People with bilateral foot pain reported a significantly higher CES-D score (p<0.015), worse SF-12 mental (P=0.017) and physical (P<0.001) component scale scores and poorer scores on all WOMAC subscales (p<0.01) compared to the no foot pain group. Furthermore, the ipsilateral foot pain subgroup reported significantly worse SF-12 physical scores (p=0.004), higher WOMAC pain (p=0.029) and stiffness (p=0.017) scores, walked significantly more slowly (p=0.049) and performed significantly slower on the repeated chair stand test (p=0.042) compared to people without foot pain. No differences were found between the contralateral foot pain subgroup compared to the no foot pain group on any of the measures.

Clinical and functional comparison between subgroups with and without foot pain

	No foot pain (n=938)	Foot pain (n=317)	P*	Ipsilateral foot pain (n=87)	Contralateral foot pain (n=56)	Bilateral foot pain (n=174)	P*
Depression, CES-D score	5.0 (-3.0-13.0)	6.0 (-3.0-15.0) †	0.007	7.0 (-3.0-17.0)	5.0 (-3.8-13.8)	6.0 (-4.0-16.0) †	0.002
SF-12 Mental Score	56.3 (46.6-66.1)	54.6 (42.4-66.8) †	0.017	54.4 (41.0-67.8)	54.9 (45.3-64.4)	54.4 (42.1-66.6) †	0.019
SF-12 Physical Score	47.3 (34.5-60.1)	43.5 (27.7-59.2) †	<0.001	41.6 (23.1-60.0) †	48.9 (37.1-60.7)	42.6 (27.0-58.2) †	<0.001
WOMAC Pain	5.0 (-1.0-11.0)	6.0 (0.3-11.6) †	<0.001	7.0 (3.0-11.0) †	6.0 (0.0-12.0)	7.0 (1.0-13.0) †	<0.001
WOMAC Stiffness	3.0 (1.0-5.0)	3.0 (0.0-6.0) †	0.003	4.0 (1.0-7.0) †	2.5 (0.5-4.5)	4.0 (1.0-7.0) †	0.012
WOMAC Function	14.9 (-2.5-32.3)	20.2 (-1.7-42.1) †	<0.001	20.2 (-2.7-43.1)	20.1 (-0.2-40.4)	21.0 (-0.5-42.5) †	<0.001
WOMAC Total	22.0 (-1.0-45.0)	30.6 (0.7-60.5) †	<0.001	31.0 (2.1-59.9)	28.5 (-0.9-57.9)	32.0 (2.0-62.0) †	<0.001
20m walk pace, m/s	1.30 (1.03-1.57)	1.24 (0.96-1.52) †	0.024	1.22 (0.99-1.46) †	1.29 (0.94-1.64)	1.25 (0.94-1.55)	0.019
Repeated chair stand pace, stand/s	0.46 (0.29-0.63)	0.42 (0.23-0.61)	0.057	0.40 (0.23-0.57) †	0.46 (0.24-0.68)	0.42 (0.24-0.61)	0.014

CES-D = Centre for Epidemiologic Studies Depression Scale; SF-12 = Short Form-12; WOMAC = Western Ontario and McMaster Universities Osteoarthritis Index.

\* Significance of MANCOVA between the foot pain and no foot pain groups, and between foot pain subgroups and the no foot pain group, adjusted for age, gender, BMI, KL grade and co-morbidities.

† Significantly different to no foot pain group.

observed in females (HR 1.10 per SD increase in 25(OH)D concentrations, 95% CI 0.87, 1.39).

**Conclusions:** Higher serum 25(OH)D concentrations were associated with an increased risk of hip replacement for osteoarthritis in males, but not in females. The mechanism for the association warrants further investigation.

### 524 THE PREVALENCE AND IMPACT OF FOOT PAIN IN PEOPLE WITH KNEE OSTEOARTHRITIS: DATA FROM THE OSTEOARTHRITIS INITIATIVE

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**Purpose:** Knee osteoarthritis is a highly prevalent condition that adversely affects function and quality of life. Foot pain is also common and disabling, and therefore concurrent foot pain in people with knee OA may further exacerbate disability and symptom severity than if

**Conclusions:** These findings show that foot pain is common in people with knee OA, and bilateral and ipsilateral foot pain adversely affects health and function suggesting laterality is important. Further research is needed to establish the mechanism and interaction of pathology at these sites, and to evaluate foot pain treatment in this population.

### 525 IS KNEE ALIGNMENT AND MORPHOLOGY ASSOCIATED WITH PATELLOFEMORAL OSTEOARTHRITIS? A SYSTEMATIC REVIEW

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**Purpose:** Osteoarthritis (OA) affecting the patellofemoral (PF) joint is strongly associated with pain and impaired function, and isolated PFOA may progress towards multi-compartment knee OA. Abnormal loading