Abstract FRI0522 – Figure 1. Flowchart of the study

Conclusions: These findings suggest that vitamin D supplementation and maintaining sufficient vitamin D levels over 24 months may have beneficial effects on depression in patients with knee OA.

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FRI0523 ZOLEDRONIC ACID PLUS PREDNISOLONE VERSUS ZOLEDRONIC ACID ALONE OR PLACEBO IN THE TREATMENT OF KNEE OSTEOARTHRITIS: A RANDOMISED TRIAL

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Background: Disease-modifying therapeutic options are needed for patients with osteoarthritis (OA). Zoledronic acid (ZA) is a potential option as it reduced both knee pain and knee bone marrow lesion (BML) size over 6 months in patients with knee OA. However, ZA infusions are often accompanied by a suite of side effects within 3 days of infusion (acute phase reactions (APRs)), which include flu-like symptoms. These may be caused by upregulation of pro-inflammatory cytokines. A preliminary study (n=20) suggested that a combination of ZA and prednisolone (VOLT01) was superior to ZA alone in reducing APR and knee pain in knee OA patients. A larger study was needed to confirm these findings and examine the new combination's effect on OA outcomes.

Objectives: To compare the effect of once-off infusion of ZA, VOLT01 and placebo on APRs, knee BML size and knee pain symptoms over 6 months in knee OA patients with significant knee pain and BMLs.

Methods: Knee OA patients ≥50 years with significant knee pain (defined as a 100 mm Visual Analogue Scale (VAS) ≥40 mm) and knee BMLs visualised on proton density weighted MRI were randomised to receive one infusion of ZA (5 mg in 100 ml saline), VOLT01 (5 mg ZA in 100 ml saline plus a 10 mg prednisolone bolus) or placebo (100 ml saline). Co-primary hypotheses were that VOLT01 would significantly reduce APRs compared to ZA, and that VOLT01 would be non-inferior to ZA in reducing BML size over 6 months. Secondary hypothesis was that VOLT01 would be non-inferior to ZA in improving knee pain and dysfunction (assessed using the Western Ontario and McMasters

Universities Osteoarthritis Index (WOMAC) and VAS) over 6 months. Mixed effect models were performed for data analyses. Analyses for change in knee pain and function scores were adjusted for baseline imbalanced values (baseline pain and utility scores, and pain medications). Non-inferiority margins were defined as 140 mm² for change in knee BML size and 8 mm for change in knee pain and function scores (WOMAC pain and function scores were averaged to a 100 mm VAS).

Results: 117 knee OA patients (63 females, mean ± standard deviation (SD) age 62.2±8.1 years) were enrolled. At baseline, mean ±SD knee pain VAS score was 50.1±18.9 mm and median BML size 370 mm². APRs were more frequent in the two active treatment groups (ZA: 87%; VOLT01: 90%) than the placebo group (55%) (both p<0.01). Compared to placebo, neither ZA nor VOLT01 significantly reduced BML size (ZA mean difference [95% CI] -21.6 [-103.0 to +59.9], VOLT01 -62.0 [-142.5 to +18.4]) or knee pain scores (WOMAC pain: ZA 2.6 [-8.5 to +13.8], VOLT01 -8.1 [-18.8 to +2.6]; VAS pain: ZA 5.4 [-6.4 to +17.1], VOLT01 -7.7 [-19.0 to +3.6]) over 6 months, but WOMAC knee function improved significantly (-9.9 [-18.2 to -1.6], p=0.02) in VOLT01-treated group. VOLT01 was non-inferior to ZA in reducing knee BML size and superior to ZA in reducing knee pain and function scores (figure 1).

Abstract FRI0523 – Figure 1. Non-inferiority tests between VOLT01 and zoledronic acid for change in BML size, knee pain and function scores. Values represent the mean difference between VOLT01 and zoledronic acid. An upper bound of 95% CI for BML size less than 140 mm² or knee symptoms less than 8 indicates that a non-inferiority of VOLT01 to zoledronic acid is demonstrated.

Conclusions: Combining prednisolone with ZA does not appear useful for reducing APRs, though there may be a small benefit over ZA alone for knee symptoms. Neither showed evidence of disease modification by changing BML size.

Disclosure of Interest: None declared

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FRI0524 CENTRAL SENSITISATION IN HAND OSTEOARTHRITIS AND ASSOCIATIONS WITH RADIOGRAPHIC SEVERITY, SYNOVITIS ON ULTRASOUND AND SYMPTOM DURATION

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Background: Patients with painful hand osteoarthritis (HOA) have enhanced central pain sensitisation (CS). Structural and inflammatory joint tissue damage over time might lead to CS. However, increased pain sensitisation can also represent an 'a priori trait' of a subgroup of patients.

Objectives: This study explored whether structural pathology, inflammation and symptom duration of HOA are associated with enhanced CS.

Methods: Through a cross-sectional study we included 300 subjects (89% women, median age 61 years (IQR 57, 67), mean body mass index (BMI) 26.5 (SD 4.9) kg/m²) with clinical and/or ultrasound verified HOA. All were examined with ultrasound (grey scale (GS) synovitis and power Doppler activity (PD)) and conventional radiographs of both hands. GS-synovitis was scored on a semi-quantitative 0–3 scale and PD to be present or not. The bilateral interphalangeal, metacarpophalangeal, first carpometacarpal and scaphotrapezoidtrapezoidal joints were scored for global HOA (using Kellgren and Lawrence scale (KL, 0–4)). Erosive HOA in the interphalangeal joints was defined with the Verbruggen-Veys anatomical phase score (VV). In addition, participants answered a question about the year of onset of their hand symptoms.

CS was measured with temporal summation (TS), the increase in perceived pain to repetitive noxious stimuli, using a mechanical probe. First, probes with increasing weight (32, 64, 128, 256 or 512mN) were applied at the wrist until the patients reported pain of at least 4/10. The selected probe was applied to the wrist times at

1 Hz. Subjects reported pain on first, fifth and tenth touch. Enhanced TS is a marker of central sensitisation and we defined the magnitude of TS as TS-Δ: high-est pain value of fifth or tenth touch minus the first pain value.

We analysed whether sum scores of KL (0–128), GS (0–90), PD (0–30), number of erosive interphalangeal joints (0–20) and symptom duration were associated with TS-Δ using separate models of linear regression with adjustments for age, sex and BMI.

Results: Median radiographic KL sum score was 28 (IQR 15, 44) and ultrasound sum scores (GS, PD) were 3 (IQR 1, 7) and 0 (IQR 0, 1), respectively. Median number of erosive joints was 0 (IQR 0, 1) and symptom duration was 6 (IQR 3, 13) years. Median TS-Δ among the participants was 1 (IQR 0, 2).

Neither KL sum score ($p=0.18$), GS-synovitis sum score ($p=0.18$), PD sum score ($p=0.86$), number of joints with erosive HOA ($p=0.078$) nor symptom duration ($p=0.21$) were associated with TS-Δ (table 1).

Table 1 Associations between OA features and temporal summation *

Associations between OA features and temporal summation *		
	Unstandardized beta (95% CI)	P-value
Symptom duration in years	0.015 (-0.01, 0.04)	0.21
Kellgren-Lawrence sum score	0.007 (-0.00, 0.02)	0.18
Grey scale synovitis sum score	-0.001 (-0.03, 0.03)	0.96
Power Doppler sum score	0.001 (-0.05, 0.06)	0.86
Number of erosive joints	0.070 (-0.01, 0.15)	0.08

*Adjusted for sex, age and BMI.

Conclusions: We found no relationship between the severity of HOA pathology and CS. This is in line with the hypothesis that factors other than OA disease severity itself contribute to CS associated pain, and that CS may be a trait in some individuals. However, it does not exclude other aspects of HOA as an initiator of CS in a subgroup of patients.

Disclosure of Interest: None declared

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FRI0525

ASSOCIATION BETWEEN DIETARY VITAMIN K INTAKE WITH KNEE SYMPTOMS AND BACK PAIN IN PATIENTS WITH KNEE OSTEOARTHRITIS

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Background: Vitamin K could be implicated in structural change of osteoarthritis (OA), but current evidence is limited or conflicting so the association between vitamin K and OA symptoms remains unclear.

Objectives: This study aims to investigate the association of vitamin K intake with knee symptoms and structural features in people with knee OA.

Methods: The parent study, Vitamin D Effect on Osteoarthritis (VIDEO) study, was conducted between June 2010 and December 2013 in Tasmania and Victoria, Australia. Knee symptoms were assessed using the Western Ontario and McMaster University Index of osteoarthritis (WOMAC) and a Visual Analogue Scale (VAS) for pain. A validated Food Frequency Questionnaire (FFQ) (developed by the Cancer Council Victoria in Australia) was completed at baseline and used to determine dietary vitamin K intake. Knee Magnetic Resonance Imaging (MRI) scans were obtained according to a standardised protocol using a 1.5 T whole-body MRI unit. Cartilage volume, cartilage defects, bone marrow lesions and effusion volume were measured. The associations between vitamin K intake quartile and changes in clinical or MRI features were analysed using linear regressions.

Results: 261 participants were included at baseline and 213 completed 2 years of follow-up. There were no significant differences between two equal divisions with high or low level of vitamin K intake in term of baseline characteristics. As table 1 and figure 1 show, higher vitamin K intake quartiles were significantly associated with greater decrease in total WOMAC score and WOMAC function score over 24 months. Similar trends were seen in WOMAC pain score and stiffness score, though not statistically significant. There were no significant associations

between baseline vitamin K intake and changes in total cartilage volume, cartilage defects, bone marrow lesions and effusion volume over 24 months.

Abstract FRI0525 – Table 1. Associations between vitamin K intake quartile and changes in clinical symptoms over 24 months

		Value of change, Mean (SD)	Multivariable*,β (95% CI)	P value	P for trend
Total WOMAC Score	Vitamin K intake quartile 1	-112.9 (327.7)	Reference:		0.046
	Vitamin K intake quartile 2	-130.0 (482.6)	-3.6 (-165.3,158.1)	0.97	
	Vitamin K intake quartile 3	-270.6 (403.3)	-149.8 (-313.8,14.2)	0.07	
	Vitamin K intake quartile 4	-234.4 (415.5)	-122.4 (-281.3,36.5)	0.13	
WOMAC Pain Score	Vitamin K intake quartile 1	-30.4 (81.8)	Reference:		0.33
	Vitamin K intake quartile 2	-32.9 (115.5)	3.3 (-37.3,43.8)	0.87	
	Vitamin K intake quartile 3	-74.8 (103.1)	-41.1 (-82.1,-0.22)	0.05	
	Vitamin K intake quartile 4	-39.7 (107.5)	-7.5 (-47.2,32.1)	0.71	
WOMAC Function Score	Vitamin K intake quartile 1	-71.4 (241.2)	Reference:		0.03
	Vitamin K intake quartile 2	-82.8 (339.4)	-5.7 (-120.3,108.8)	0.92	
	Vitamin K intake quartile 3	-168.7 (275.2)	-94.7 (-210.9,21.5)	0.11	
	Vitamin K intake quartile 4	-172.5 (301.8)	-104.1 (-216.6,8.5)	0.07	

*Adjusted for age, sex, BMI and vitamin D intervention group

P values were from analyses after adjustment for age, sex, BMI and vitamin D intervention group
*: $p<0.05$ compare with the first quartile. **: $p<0.01$ compare with the first quartile.

Figure 1 Change in WOMAC score over 24 months among those with different vitamin K intake quartiles

Conclusions: Higher baseline vitamin K intake was associated with decreased knee symptoms over 24 months in patients with knee OA. These suggest that vitamin K intake may be beneficial for knee OA.

Disclosure of Interest: None declared

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FRI0526

THE IMPACT OF DISEASE CHARACTERISTICS IN KNEE AND HIP OSTEOARTHRITIS ON RECOMMENDATIONS FOR JOINT REPLACEMENT

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Background: Joint replacement in osteoarthritis (OA) is a major reason for hospitalisation in Germany.¹

Objectives: Which factors are associated with recommendations for joint replacement in patients with symptomatic hip and/or knee OA?

Methods: A total of 9734 persons, insured in a large statutory health insurance in Germany (Barmer), who had a diagnosis of OA (ICD-10 codes M15 [polyarthrosis], M16 [coxarthrosis] or M17 [gonarthrosis]) in at least two quarters in 2014 were randomly selected, stratified by age, sex and diagnosis (M15/M16/M17). They were contacted by mail and asked to complete a questionnaire regarding sociodemographics, health behaviour, the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC, 0: no impairment- 100: extreme pain/stiffness/difficulty) and whether they had ever discussed total joint replacement (TJR) surgery with a physician. Patient-reported outcomes of the responders ($n=3,564$) were linked to claims data on prescriptions of pain medication and physical therapy. Persons with a diagnosis of M15 ($n=1,212$) were excluded from the present analysis. Patients who reported pain in the corresponding joints were analysed in three groups: OA of the knee, of the hip or of both. Logistic regression models