

the Office of National Statistics. Age- and gender standardised mortality rates were compared to the general population for all-cause mortality and disease-specific mortality (cardiovascular, cancer-related, respiratory, gastrointestinal and dementia-associated death). Multi-variable Cox regression models including demographic and socioeconomic characteristics, self-report comorbidity, hip or knee pain and disability were used to determine whether these characteristics were associated with increased mortality. Multiple imputation was used to address missing covariate data.

**Results:** We found an excess all-cause mortality in osteoarthritis patients compared to the general population with an SMR of 1.55 (95% CI 1.41 to 1.70). Excess mortality was observed for all disease-specific mortalities, but was particularly pronounced for cardiovascular (SMR 1.71, 95% CI 1.49 to 1.98) and dementia-associated mortality (SMR 1.99, 95% CI 1.22 to 3.25). The Table presents multivariable hazard ratios for the association of different baseline characteristics with all-cause mortality. Increased mortality was found with older age, male gender, self-reported history of diabetes, cancer or cardiovascular disease, and walking disability ( $P \leq 0.002$ ), but not with previous joint replacement, obesity, depression, chronic inflammatory disease, eye disease and presence of pain at baseline.

**Conclusions:** Osteoarthritis patients are at higher risk of death for any cause than the general population, which is particularly pronounced for cardiovascular and dementia-associated mortality. A history of diabetes, cancer or cardiovascular disease and the presence of walking disability at baseline increase the risk of all-cause mortality.

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#### OARSI RECOMMENDATIONS FOR THE MANAGEMENT OF HIP AND KNEE OSTEOARTHRITIS: WHICH TREATMENTS ARE BEING USED? AUDIT OF PATIENTS COMING TO ARTHROPLASTY IN SCOTLAND

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**Purpose:** The Osteoarthritis Research Society International (OARSI) has recently published 25 recommendations for the treatment of OA of the hip and knee following a critical appraisal of existing guidelines, identification of a core set of recommendations, and a systematic review of the evidence for relevant therapies. The purpose of this study was to audit current practice in Scotland for non-pharmacological (NP) and pharmacological (P) treatments in patients with OA hip or knee awaiting arthroplasty against the OARSI recommendations.

**Methods:** Patients with OA hip or knee awaiting arthroplasty in 2009/10 were interviewed by an experienced musculoskeletal nurse in an Orthopaedic Outpatient setting. Demographic data, duration of symptoms and comorbidities were recorded. Standardised questions relating to 20 audit criteria were based on the OARSI recommendations for NP and P treatments. Information obtained was recorded using an audit support tool adapted from the National Institute for Health and Clinical Excellence (NICE).

**Results:** 200 Caucasian patients (87 male, 113 female), mean age 67 years (range 36-91) were interviewed. 110 had hip OA and 90 knee OA. The duration of symptoms prior to elective arthroplasty was 6 (range 0.5-39) years for hip OA and 9 (0.5-50) years for knee OA. Most patients were overweight, BMI  $>25$  in 73% of those with hip OA and 80% knee OA; and many were obese, BMI  $>30$  in 33% of hip OA and 53% of knee OA patients. Most (70% hip OA, 78% knee OA) had received a combination of P and NP therapies but written information about the objectives of therapy and the need for lifestyle modifications had been given to less than half. Only 43% of patients with a BMI  $>25$  had ever been encouraged to lose weight, and only 20% maintained weight loss. Advice to exercise had been given to 67% of patients and 61% had been referred to a physiotherapist for assessment and instruction in appropriate exercises. While 90% had been instructed in muscle strengthening exercises, 84% in range of motion exercises and 56% were given pool exercises; advice about aerobic fitness exercise was given to only 31% and advice on appropriate footwear to only 23%. Ambulatory aids were used by 30% of patients but other NP modalities of therapy were seldom employed: thermal treatments 26%, acupuncture 15%, TENS 6%, shoe insoles 9%, knee braces 2% and regular telephone contact in 3%. Patients  $>75$  years of age were referred to a physical therapist less frequently (46%) and used NP modalities of treatment less often. All patients had used analgesic drugs but acetaminophen was the initial choice in only 55% and 81% had used preparations containing weak opioids. Oral NSAIDs were taken by 64% of patients, in 43% without gastric protection, and 33% had experienced upper GI symptoms. Selective COX-2

inhibitors were only used by 5% of patients. Topical NSAIDs were employed by 31% of patients, more often as an adjunct than as an alternative to oral medication. Capsaicin was used by 4% of patients. Nutraceuticals were taken by 40% of patients, either as glucosamine sulphate alone (24%) or in combination with chondroitin sulphate. 19% of patients with knee OA had had at least one intra-articular (IA) corticosteroid injection and 5% had undergone joint lavage, but IA hyaluronate injections were not used.

**Conclusions:** In many patients with OA hip and knee coming to arthroplasty in Scotland OARSI recommendations for P, and particularly NP treatment, have never been implemented. The audit suggests that there is a need for dissemination of the guidelines, for the development of standards of care and especially for overcoming barriers to provision of core therapies.

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#### RISK FACTORS AND SYMPTOMS OF RADIOLOGICAL KNEE OSTEOARTHRITIS: DOES BMI MAKE A DIFFERENCE?

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**Purpose:** Being overweight is a known risk factor for osteoarthritis (OA). Whether there are differences in risk factors for, and symptoms of, OA between overweight people and normal weight people is not yet known.

We aim to identify which risk factors and symptoms are associated with the prevalence of radiological knee OA (ROA, Kellgren & Lawrence score  $\geq 2$ ) in people with high BMI ( $\geq 27$ ) and in people with normal BMI ( $<27$ ) and if these differ between the two groups.

**Methods:** Data of the RS-III-1 cohort of the Rotterdam study was used (a population based cohort study). Eligible participants were aged 45-60 years and had an available knee X-ray. In total 1242 people with normal BMI (mean age 54.4, 59.7% females) and 1224 with high BMI (mean age 54.8, 53.0% females) were included. Univariate logistic regression analysis was used to test potential risk factors for knee ROA in people with high vs. normal BMI. Symptoms and female hormonal specific risk factors were tested in women only.

Tested potential risk factors were: age, gender, BMI, hip ROA, knee trauma, diabetes, and varus alignment in one or both knees. In women-only additional risk factors were tested: menopausal (MP-) status, age at menarche  $\geq 12$  years, waist-hip ratio, and Heberden nodes (HN). Tested symptoms were: WOMAC pain score, knee morning stiffness, limited extension (vs. normal/hyper), and pain on palpation.

Risk factors and symptoms differing in statistical significance between the groups were tested for interaction with BMI using multivariate logistic regression analysis. All outcomes were adjusted for age and BMI.

**Results:** Knee ROA was present in 5.8% in the normal BMI group and 9.0% in the high BMI group.

In people with normal BMI the statistically significant risk factors were: age (Odds Ratio=1.08), and BMI (OR=1.16). In women-only these were: MP-status (OR=3.98), and age at menarche (OR=0.39). The only statistically significant symptom was limited extension (OR=2.44).

Statistically significant risk factors in the high-BMI group were: age (OR=1.08), BMI (OR=1.13), and knee trauma (OR=1.61). In women-only this was HN (OR=2.19). Statistically significant symptoms were: WOMAC pain (OR=5.14), morning stiffness (OR=4.67), and limited extension (OR=2.65).

Differences between the normal BMI group vs. the high BMI group in significant relationships were seen in the following risk factors: knee trauma (BMI  $<27$  OR=1.27 vs. BMI  $\geq 27$  OR=1.61), MP-status (3.98 vs. 1.31), age at menarche (0.39 vs. 0.59), and HN (1.65 vs. 2.19). For symptoms differences in significant relationships were seen in: WOMAC pain (2.52 vs. 5.14), morning stiffness (1.90 vs. 4.67), and limited extension (2.44 vs. 2.65). All risk factors and symptoms that differ in statistical significance were formally tested for interaction with BMI; none of the interactions were statistically significant.

**Conclusions:** Risk factors for, and symptoms of, knee ROA do differ between people with normal vs. high BMI. There are strong indications that: 1) in overweight women morning stiffness is much stronger related to having knee ROA than in non-overweight women and 2) in non-overweight women is being post-menopausal related to having knee ROA, but not in overweight women.