

risk factors for accelerated KOA. While we found that these three factors were independently associated with accelerated KOA we did not test whether combinations of being overweight, older, and suffering a recent knee injury increased the likelihood of accelerated KOA. Hence, we pursued exploratory analyses to test our hypothesis that individuals with more than one of these risk factors were more likely to develop accelerated KOA than normal-weight, young individuals with no recent knee injury.

Methods: We conducted longitudinal analyses among participants in the Osteoarthritis Initiative who had no radiographic KOA at baseline (Kellgren-Lawrence [KL]<2). Participants could have one of three outcomes: 1) accelerated KOA: at least one knee progressed to end-stage KOA within 48 months, 2) common KOA: at least one knee increased in radiographic scoring within 48 months (excluding those with accelerated KOA), and 3) no KOA: no change in KL grade in either knee. We defined 8 groups as a predictor based on the combination of body mass index (cut-point: 25 kg/m²), age (45 to 64 years, ≥ 65 years), and a self-reported knee injury in the year prior to the study outcome. A knee injury was defined as an injury bad enough to limit a person's ability to walk for at least two days. We used a multinomial logistic regression to determine if the outcome of accelerated or common KOA was associated with the 8 groups. The reference group was younger participants with normal weight and without a recent knee injury. The reference outcome was no KOA. The regression was adjusted for sex and baseline presence of static knee malalignment and systolic blood pressure.

Results: We previously described the baseline characteristics of OAI participants with no KOA (n=1325), common KOA (n=187), and accelerated KOA (n=54). Overall, 58% were female and 74% had static knee malalignment (varus or valgus). The interaction term of group by the outcome of OA status was highly significant (p<0.0001). Four groups were more likely to experience accelerated KOA instead of no KOA compared with normal-weight, younger individuals without a recent knee injury: 1) normal-weight, older, with recent knee injury (odds ratio [OR]=76.0); 2) overweight, older, with a recent knee injury (OR=25.9); 3) overweight, younger, with a recent knee injury (OR=22.8); and 4) overweight, older, without a recent knee injury (OR=4.5, see Table).

Conclusions: We found that a recent knee injury among older and/or overweight individuals is a strong risk factor for accelerated KOA. Specifically, an overweight individual with an injury, regardless of age, is much more likely to experience accelerated KOA. Older participants who were normal weight and had a recent knee injury were also more likely to develop accelerated KOA. Interestingly, though the numbers were small, younger participants who were normal weight and had a recent injury did not develop accelerated KOA but were at higher risk for common KOA. Finally, we verified that being older and overweight is associated with accelerated KOA even in the absence of an injury. These results highlight that we should be concerned when older or overweight individuals report a history of a recent knee injury.

Purpose: While hip and knee osteoarthritis (OA) are usually associated with older age, it is increasingly recognised that young people are also affected by these conditions, often related to sporting injuries, road trauma, or congenital conditions. As studies have generally focused on older individuals, little is known about the experience of younger adults with hip or knee OA who can face a distinct set of pressures including work responsibilities and parenting roles. High levels of distress have been reported in clinical studies of older people with OA and people with severe disease awaiting joint replacement but the psychological wellbeing of young people with OA has not been specifically investigated. This study aimed to report the prevalence of psychological distress among young people with hip or knee OA, and compare this to age- and sex-matched population norms.

Methods: People aged 20-55 years with hip or knee OA were recruited from 3 major public hospitals in the state of Victoria, Australia following screening of orthopaedic outpatient clinics lists and referrals, and through community-based advertisements. The study was approved by the Human Research Ethics Committee at each hospital and at The University of Melbourne, and written informed consent was obtained from all participants. A study questionnaire containing validated measures was mailed to each participant. Psychological distress was assessed using the Kessler K10 instrument and K10 scores were categorised according to Australian Health Survey definitions. A K10 score <16 indicates low distress, 16-21 indicates moderate distress, 22-29 indicates high distress and ≥30 indicates very high distress. High K10 scores are known to be strong predictors of depression and anxiety. K10 data were compared to age- and gender-matched data from the 2011-12 Australian Health Survey for the Australian population aged 18-54 years, and the relative risk of high/very high psychological distress (K10 score ≥22) for the sample (compared with the population) was calculated.

Results: We recruited 147 participants for the study (n=126 from hospitals and n=21 from community-based recruitment). Twenty-eight per cent of the sample (n=41) was classified as having low psychological distress and 24% (n=35) was classified as having moderate distress. The prevalence of high psychological distress among the sample was substantially greater than for the general population aged 18-54 years (31% vs 8%), as was the prevalence of very high distress (16% vs 4%). Sensitivity analyses excluding participants who had been medically-diagnosed with anxiety or depression (n=41) showed that the prevalence of high distress (31%) and very high distress (8%) among the study sample remained higher than for the normal population. To put these prevalence data in context, study participants were over 4 times more likely to have high or very high psychological distress, compared with the Australian population of a similar age (relative risk 4.19, 95%CI 3.53 to 4.98). Sex-specific analyses showed that both sexes had a significantly higher likelihood of reporting high/very high distress, compared with their population counterparts (relative risk for males 4.49, 95%CI 3.25 to 6.19; relative risk for females 3.80, 95%CI 3.10 to 4.64).

Table

An interaction between age, body mass index, and injury influences the risk of accelerated knee osteoarthritis (KOA)

	No KOA	Common KOA	Accelerated KOA	Adjusted odds ratio	
	(n = 1325) REFERENCE	(n = 187)	(n = 54)	Common KOA	Accelerated KOA
Normal-Weight - Younger - No injury	321 (24.2%)	41 (21.9%)	4 (7.4%)	Reference	Reference
Normal-Weight - Younger - Injury	5 (0.4%)	3 (1.6%)	0 (0%)	6.6 (1.5, 29.3)	n/a
Normal-Weight - Older - No injury	132 (10.0%)	10 (5.4%)	2 (3.7%)	0.8 (0.4, 1.6)	1.1 (0.2, 6.4)
Normal-Weight - Older - Injury	3 (0.2%)	2 (1.1%)	3 (5.6%)	3.5 (0.3, 35.1)	76.0 (11.4, 504.5)
Overweight - Younger - No injury	574 (43.3%)	87 (46.5%)	18 (33.3%)	1.6 (1.0, 2.4)	2.5 (0.8, 7.6)
Overweight - Younger - Injury	20 (1.5%)	13 (7.0%)	6 (11.1%)	6.0 (2.7, 13.4)	22.8 (5.9, 88.2)
Overweight - Older - No injury	256 (19.3%)	28 (15.0%)	15 (27.8%)	1.1 (0.6, 2.0)	4.5 (1.4, 14.3)
Overweight - Older - Injury	11 (0.8%)	0 (0%)	4 (7.4%)	n/a	25.9 (5.6, 119.9)
Missing data	3 (0.2%)	3 (1.6%)	2 (3.7%)		

Normal-Weight (BMI < 25 kg/m²), young (age 45 - 64 years). Injuries were within 1 year of the study outcome (recent new knee Injury). Models adjusted for sex, blood pressure, and malalignment at baseline. Percentages are reported by column (within No KOA, Common KOA, and Accelerated KOA).

275

HIGH LEVELS OF PSYCHOLOGICAL DISTRESS AMONG YOUNG PEOPLE WITH HIP AND KNEE OSTEOARTHRITIS

I. Ackerman †, A. Bucknill ‡, R. Page §, N. Broughton ||, C. Roberts ‡, B. Cavka ‡, P. Schoch ¶, C. Brand †. †The Univ. of Melbourne, Parkville, Australia; ‡Melbourne Hlth., Parkville, Australia; §Univ. Hosp. Geelong and Deakin Univ., Geelong, Australia; ||Peninsula Hlth., Frankston, Australia; ¶Univ. Hosp., Geelong, Australia

Conclusions: High levels of psychological distress were evident among young people with hip or knee OA. The observed psychological outcomes substantially augment the health burden of OA, with implications for the holistic management of this patient group. Interventions to detect and reduce psychological distress warrant consideration given the chronicity of OA; young people may need to self-manage their OA for many years before joint replacement surgery is deemed appropriate. OA models of care for younger patients should incorporate routine

screening for psychological distress, and establish appropriate referral and support mechanisms to optimise psychological wellbeing.

276 ASSOCIATION OF KNEE TIBIOFEMORAL OSTEOARTHRITIS AND LIMITATIONS IN PHYSICAL FUNCTION IN A RURAL CHINESE POPULATION: THE WUCHUAN OA STUDY

X. Wu †, J.B. Niu ‡, Y.Q. Zhang ‡, Q. Liu †, Z.M. Cao †, X. Tang †, Y. Ke †, R.J. Li †, H. Li †, W.C. Han §, J. Huang §, J.H. Lin †. † Peking Univ. People's Hosp., Beijing, China; ‡ Boston Univ., Boston, MA, USA; § Puyang Chinese Med. Hosp., Pu Yang, China; ‖ The Second Affiliated Hosp. of Inner Mongolia Med. Univ., Huhhot, China

Purpose: Knee osteoarthritis (OA) is a common joint disorder among the elderly Chinese, especially among those living in the rural areas. Knee OA causes more limitations in physical function than other chronic conditions. Approximately 50% of Chinese people live in the rural areas;

latent groups of self-reported function limitation: 1: little function limitation (n=685, 57.7%), 2: mild function limitation (n=131, 11.0%), 3: moderate function limitation (n=244, 20.5%), and 4: severe function limitation (n=128, 10.8%). The mean posterior probability of subgroup assignment was 0.86, suggesting a good-fit of model. As shown in Table 1, compared with those without TFROA, participants with TFROA were more likely to have mild (latent group 2), moderate (latent group 3) and severe (latent group 4) self-reported physical function limitation. Participants with TFROA also had slower walking speed (1.02m/s) and narrower range of motion (128.0°) than those without TFROA (1.07m/s, 132.7°). The associations of TFSxOA with self-reported and measured physical function limitations were even stronger than that of TFROA.

Conclusions: Our study found that both TFROA and TFSxOA were strongly associated with self-reported and measured physical function limitations. Considering the high prevalence of TFROA and TFSxOA among people living in the rural areas in China, physical function limitation due to TFROA and TFSxOA may be a major public health problem among Chinese elderly.

Table 1. Relation of TFROA and SxOA to self-reported and measured physical functions

Latent groups of self-reported function limitation, prevalence (%)	TFROA			SxOA		
	No TFROA	TFROA	OR(95% CI) ¹¹ , with vs. without TFROA	No SxOA	SxOA	OR(95% CI) ¹¹ , with vs. without SxOA
little	65.8	42.6	1.0	66.7	32.5	1.0
Mild especially for chair standing & getting up bed	9.6	13.7	1.8(1.2, 2.7)*	9.5	15.3	2.8(1.8, 4.4)*
Moderate except for chair standing & getting up bed	17.9	25.5	1.7(1.2, 2.4)*	17.3	29.6	2.9(2.0, 4.2)*
Severe	6.7	18.3	2.7(1.8, 4.3)*	6.2	22.6	4.8(3.1, 7.6)*
Measured physical function, adjusted mean						
	No TFROA	TFROA	beta (95% CI), with vs. without TFROA	No SxOA	SxOA	beta (95% CI), with vs. without SxOA
Walking speed, m/s	1.07	1.02	-0.05 (-0.08, -0.03)*	1.09	1.00	-0.08 (-0.11, -0.06)*
Range of motion, degree	132.7	128.0	-4.8 (-5.9, -3.7)*	132.3	127.0	-5.3 (-6.6, -4.0)*

¹¹ Adjusted for age, sex, BML degree of education, and number of comorbidities

*p-value < 0.05

however, little is known on the effect of tibiofemoral knee OA on physical functions among individuals living in the rural areas in China.

Methods: Wuchuan Osteoarthritis Study is a population-based cohort study conducted in the rural areas of Wuchuan County, Huhhot, Inner Mongolia of China. Subjects completed the home-interview in 2013. Questions on knee symptoms and 8 physical functions of daily-living activities (e.g. walking 1 kilometer, going up or down stairs, bending or kneeling, preparing meals, cleaning house, strolling around house, chair standing, getting up bed) were asked for each participant. Physical function was graded into four categories: 1: no difficulty, 2: some difficulty, 3: very difficult, and 4: unable to do. All subjects were instructed to perform various physical function tests, including 50 feet (15.24 meters) walking test and range of motion (ROM) test for each knee by two examiners using goniometers (inter-rater correlation coefficient > 0.80). Participants had bilateral weight-bearing posterior-anterior radiographs at local hospital. Kellgren & Lawrence (K/L) grade on the radiograph was scored by one rater (intra-rater kappa 0.90). A knee was defined as having tibiofemoral radiographic knee OA (TFROA) if its K/L score ≥ 2 and symptomatic OA (SxOA) if presence of both TFROA and knee pain (i.e., pain lasting for at least one month in the past year) in the same knee. We defined a subject as having TFROA if at least one knee had TFROA and as having TFSxOA if at least one knee had TFSxOA.

We identified distinct groups of self-reported physical function limitations based on subject's response to each of the 8 physical function questions using a latent class model (SAS PROC LCA). We examined the relation of TFROA to the latent groups of self-reported function limitation using multinomial logistic regression model and to two measured physical functions (i.e., range of motion and walking speed) using linear regression models. Since range of motion was assessed for each knee separately we used the generalized estimating equations to examine its association with TFROA accounting for the correlation between two knees. In all regression models we adjusted for age, sex, BMI, education, and number of comorbidity. We took the same approach to examine the relation of TFSxOA to the self-reported as well as measured physical functions.

Results: Of 1188 subjects in Wuchuan OA study (men: 44.9%, mean age: 59.4 years, mean BMI: 23.2 kg/m²), 416 subjects (35.0%) had prevalent knee TFROA and 314 (26.4%) had TFSxOA. We identified four distinct

277

EVIDENCE OF EARLY POST-TRAUMATIC OSTEOARTHRITIS AND OTHER NEGATIVE HEALTH OUTCOMES 3-10 YEARS FOLLOWING KNEE JOINT INJURY IN YOUTH SPORT

J.L. Whittaker †‡, L.J. Woodhouse §||, J.J. Jaremko ¶, A. Nettel-Aguirre ‡, C.A. Emery †‡. † Sport Injury Prevention Res. Ctr., Faculty of Kinesiology, Univ. of Calgary, Calgary, AB, Canada; ‡ Alberta Children's Hosp. Res. Inst. for Child and Maternal Hlth., Faculty of Med., Univ. of Calgary, Calgary, AB, Canada; § Dept. of Physical Therapy, Faculty of Rehabilitation Med., Univ. of Alberta, Edmonton, AB, Canada; || Alberta Hlth.Services, Bone and Joint Strategic Clinical Network, Edmonton, AB, Canada; ¶ Dept. of Radiology & Diagnostic Imaging, Faculty of Med., Univ. of Alberta, Edmonton, AB, Canada

Purpose: Osteoarthritis (OA) is the most common chronic joint disease for which there is no known cure. It commonly affects the knee joint and is associated with pain, disability and increased comorbidity rates. Meta-analyses indicate a 3.9 (95%CI 2.0,7.2) fold increased risk of developing post-traumatic osteoarthritis (PTOA) after significant knee joint trauma. There is a paucity of research examining outcomes associated with PTOA early in the period (<10 years post-injury) between joint injury and disease onset. Improved understanding of this interval could inform secondary prevention strategies aimed at delaying or preventing progression to disease. This investigation examines the association between sport-related knee joint injury and clinical, behavioral, functional, physiological and structural outcomes related to future PTOA, 3-10 years post-injury.

Methods: This historical cohort study includes 140 young adults (ages 15 to 26) recruited from previous studies examining youth sport injury risk. Seventy individuals who had sustained a sport-related intra-articular knee injury 3-10 years previously (median; range: 6.6; 3-10yrs) were age, sex and sport-matched with 70 uninjured controls (78 males; 17-26yrs: 62 females; 15-26yrs). History of intra-articular knee injury (clinical diagnosis including bone, cartilage, ligament or meniscal injury requiring medical attention and time loss from sport) was established from previous study injury report forms and then confirmed by participants. Outcome measures include; Knee OA and Injury Outcome Score (KOOS; clinical), amount of weekly physical activity (PA;