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273 PATIENT-RATED OSTEOARTHRITIS SEVERITY IN AN EMPLOYED POPULATION: COMPARISON OF IMPACT WITH NON-OSTEOARTHRITIS WORKERS USING DATA FROM THE NATIONAL HEALTH AND WELLNESS SURVEY

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Purpose: There is increasing recognition that osteoarthritis (OA) affects participants in the workforce, but there are only limited data on the contribution of disease severity to the OA burden in an employed population. This study evaluated the relationship between patient-rated OA severity and quality of life, healthcare resource utilization, productivity, and costs among workers relative to workers without OA.

Methods: Data were analyzed from the 2009 National Health and Wellness Survey. Univariate and multivariable analyses characterized employed individuals (full-time, part-time, or self-employed) ≥20 years of age who were diagnosed with OA and self-rated their OA severity as mild, moderate, and severe relative to employed individuals not experiencing OA. Assessments included work productivity (Work Productivity and Activity Impairment questionnaire [WPAI]); quality of life (SF-12v2 Health Survey and SF-6D health index); and healthcare utilization (type and number of resources within the past 6 months). Direct and indirect costs were also estimated.

Results: 4,876 workers reported being diagnosed with OA (45.0% mild, 45.5% moderate, and 9.1% severe) and 34,896 workers served as the no-OA comparator cohort. Weighted univariate analysis of demographic characteristics showed a greater proportion of females in the OA cohort (53.9% vs 45.6%; P < 0.0001) and higher proportions of OA individuals in the 40 to 64 year and ≥65 year age ranges (P < 0.0001). As OA severity increased, workers reported more frequent pain, poorer quality of life, greater use of specific healthcare resources (emergency room and hospitalizations) and reduced productivity, primarily due to presenteeism. All outcomes indicated a significantly greater burden among workers with OA relative to those without OA (P < 0.0001), and the disparity between workers with OA and without OA increased at greater levels of OA severity. Estimated total annual costs per worker were $9,801 for mild OA, $14,761 for moderate OA, and $22,111 for severe OA compared with $7,891 for workers without OA (P < 0.0001). Costs were driven by indirect costs resulting from lost productivity, accounting for 70% to 74% of total costs, even among workers without OA.

Conclusions: OA conveys a substantial burden on workers relative to workers without OA, and this burden increases as self-rated OA severity increases.

274 THE EFFECT OF KNEE BRACES ON QUADRICEPS STRENGTH AND INHIBITION IN SUBJECTS WITH PATELLOFEMORAL OSTEOARTHRITIS (PFOA)

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Purpose: Patellar bracing has been adopted for the treatment of non arthritic patellofemoral pain but has not been used as readily for patellofemoral osteoarthritis (PFOA). One reason for this reluctance may be the perception among clinicians that prolonged knee or patellar bracing produces quadriceps weakness. There is little, if any, evidence to support a detrimental effect on the quadriceps muscle of patellar braces in PFOA.

Therefore, we sought to investigate the immediate and short term (12 weeks) use of a patellofemoral brace on quadriceps maximum voluntary contraction (MVC) and arthrogenous muscle inhibition (AMI) of the quadriceps in patients with PFOA.

Methods: Subjects between ages 40 and 70 with knee pain on stair climbing, kneeling, prolonged sitting or squatting were included if they had a K-L score grade 2 or 3 in the PFJ and this was greater than K-L score for the tibiofemoral compartments. In addition, subjects had to have lateral or medial patellar facet tenderness or a positive patellar compression test. Pain was present daily for the at least 3 months with a score of 4 on a 0–10cmVAS for a nominated activity. 34 subjects met these criteria (mean age 56.9 years (SD 6.5); 20 females).

AMI data were collected using the twitch interpolation technique. The maximal single peak torque value with a 1 Hz twitch interpolation and also the activation deficit (AD) levels at 100% MVC were calculated as a percentage figure from the ratio: AD = Interpolated twitch torque/Resting twitch torque (IT/RT) × 100.

MVC was measured on a dynamometer (Isocom, Isokinetic Technology, Bingham Industrial Estate, Nottingham, UK). Each subject performed the task with 90° hip and knee flexion. The knee joint articulation axis was aligned to the dynamometer mechanic arm lever axis. The length of the dynamometer arm was adapted according to the length of the leg of the patient. Standardised verbal encouragement was given during the test performance.

Treatment: Subjects were given a Biosklin Patellar Tracking Q Brace (Ossur UK, Manchester, England) as part of a crossover study (brace/no brace) to look at the effect of bracing on PFOA, which was worn for at least 5 hours daily for 12 weeks. The order of brace wearing was randomised.

Statistical Analysis: Three separate analyses were performed: Part A compared brace wearers (n = 17) to non-wearers (n = 17) in terms of changes in MVC and AMI at six week follow up. Part B examined the immediate change in MVC and AMI at week 6 of treatment when a brace was applied in all 34 participants. Finally, part C established whether MVC and AMI changed at 12 weeks of brace wearing, compared to baseline. In all analyses, statistics were tested through comparison of 95% confidence intervals constructed around the median value and differences were tested using a Wilcoxon Rank Sum test.

Results:

Part A: At 6 week follow up, the MVC for brace wearers (median change = 4.70Nm, IQR −6.30 to 18.61) was not significantly different from the non-wearers (median change = 5.70Nm, IQR −3.30 to 23.60) (z = 0.52, p = 0.61). However, the AMI at week 6 did differ significantly between groups (z = 1.98, p = 0.048). In the brace wearers group, median difference in AMI was improved slightly from baseline (−3.94pp (IQR −7.63 to 4.48), compared to 1.75pp (IQR −4.96 to 22.39) in the non-wearers group.

Part B: MVC was significantly higher when a brace was worn during testing (median difference in torque between brace on and brace off = 7.5Nm (95% CI 1.00 to 13.76), AMI was not significantly different (median difference in AMI between brace on and brace off = −4.15pp, 95% CI −6.72 to 1.02).

Part C: After 12 weeks of brace wearing, neither MVC (median change from baseline 3.45Nm, 95% CI −7.51 to 13.6) nor AMI (median change from baseline −4.37pp, 95% CI −14.47 to 1.02) changed significantly compared to baseline at week 12.

Conclusion: We conclude that in contrast to popular perceptions, patellar bracing does not notably decrease quadriceps function after 12 weeks of treatment. In addition, patellar bracing has the instantaneous effect of significantly improving quadriceps MVC. Brace use should not be discouraged because of concerns about deleterious effects on quadriceps strength and muscle inhibition.

275 IDENTIFICATION OF CLINICAL PHENOTYPES IN KNEE OSTEOARTHRITIS: DATA FROM THE OSTEOARTHRITIS INITIATIVE

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Purpose: It has been hypothesized that the heterogeneous population of knee OA patients actually consists of different subgroups or phenotypes. This study aimed 1) to identify phenotypes of knee OA patients based on similarities on clinically relevant patient characteristics, and 2) to compare clinical outcomes of these phenotypes.

Methods: Data from 841 knee OA patients of the Osteoarthritis Initiative were used. A cluster analysis was performed, in which phenotypes were identified based on similarities on four clinically relevant patient characteristics: severity of radiographic OA, muscle strength, body mass index and depression. Univariable and multivariable regression analyses...