SENSORIMOTOR DEFICITS IN TENNIS ELBOW: RESULTS OF A RANDOMISED CONTROLLED TRIAL. Bisset L¹, Darnell R², Vicenzino B²; ¹Griffith University, Gold Coast, Australia. ²The University of Queensland, Brisbane, Australia

PURPOSE: The purpose of this randomised controlled trial was to evaluate the effect of a physiotherapy programme, corticosteroid injections or a wait and see approach on sensorimotor performance in patients with tennis elbow (TE). RELEVANCE: TE is a chronic musculoskeletal condition affecting approximately 1-3% of the general population. The poorly understood aetiology of TE is reflected by the multiple clinical treatments currently in use. Recent research suggests a neurophysiological component, evidenced by sensorimotor deficits such as upper limb reaction time and speed of movement in the order of 11-32%. However, changes in sensorimotor deficits in response to currently accepted treatments have not been assessed. PARTICIPANTS: 198 participants aged (mean ± SD) 47.6 ±7.8 with a clinical diagnosis of unilateral TE were selected from the general community. Exclusion criteria included bilateral symptoms or any other systemic, neck or upper limb pathologies. In addition, a healthy control group of 40 participants (aged 48.4 ±7.7) with no history of neck or upper limb pathology were included in the baseline data collection. METHODS: TE participants were randomised into one of three groups: the wait and see group received advice; the corticosteroid injection group received up to two injections and the physiotherapy group received eight treatments which consisted of “Mobilization with Movement” manipulation technique and an exercise program. Outcome measures of upper limb reaction time, upper limb speed of movement, pain severity and global improvement were taken at baseline, then at 3, 6, 12, 26 and 52 weeks post-randomisation. ANALYSIS: Outcome measures were estimated using linear mixed models with participant defined as a random effect and treatment and time as fixed effects (p•<•0.01). Significant effects were further assessed using ANOVAs at the primary endpoints of six and 52 weeks (p•<•0.01). Linear regression analyses were used to examine the relationship between sensorimotor measures and patient characteristics (age, sex, duration of condition, previous elbow symptoms, additional treatment during follow up, recurrence of condition during follow up). Finally, comparison of baseline and 52-week sensorimotor measures between the TE cohort and controls were assessed using ANOVAs (p•<•0.01). RESULTS: Significant deficits in reaction time and speed of movement in the TE group compared to controls were confirmed at baseline (p•=•0.003), with no difference between sides. Although sensorimotor measures significantly improved over time (simple reaction time (SRT) mean change 0-52 weeks: 17.3msec; 99%CI 11.7 to 22.9), there were no significant differences between interventions (p•=•0.718). At 52 weeks the TE cohort remained significantly worse compared to controls (SRT mean difference 17.9msec, 99%CI 4.2 to 31.6),
despite the majority of participants reporting success (159/190). **CONCLUSIONS:** It appears that upper limb reaction time and speed of movement are affected bilaterally in unilateral TE. Sensorimotor measures change over time, but this change is independent of treatment and not strongly related to baseline clinical characteristics. **IMPLICATIONS:** Sensorimotor deficits appear to be a part of the aetiological profile of TE, however current treatments do not preferentially affect these deficits. Treatments that specifically address sensorimotor deficits should be incorporated into the overall management of patients with TE. The clinical significance of sensorimotor deficits requires further investigation. **KEYWORDS:** Manual therapy, musculoskeletal, sensorimotor. **FUNDING ACKNOWLEDGEMENTS:** Financial support from The University of Queensland and National Health & Medical Research Council (Primary Care Research), Australia #252710. **CONTACT:** l.bisset@griffith.edu.au

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