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- a) TITLE: Participants with features of central sensitisation have greater pain and disability at six months following musculoskeletal trauma: an exploratory study
- b) NAME OF PRESENTER and CO-AUTHORS: **Nicola Middlebrook**, Alison Rushton, Deepa Abichandani, David W Evans, Marco Barbero, Nicola Heneghan, Deborah Falla
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- d) CONFERENCE THEME: Chronic pain and disability is common following multi-system trauma. Central sensitisation could offer an explanation to the development of chronic pain. No study has evaluated features of CS in the acute stages following musculoskeletal trauma and whether features are evident in patients with pain and disability at six months.
 - e) BIOGRAPHY: Nicola Middlebrook is an experienced musculoskeletal physiotherapist and is in the final stages of her PhD and due to submit her thesis in 2020. Her PhD focuses on pain and disability following musculoskeletal trauma. She qualified as a physiotherapist from the MSc Physiotherapy (Pre-Registration) in 2009 from the University of Birmingham and focused her clinical time to musculoskeletal physiotherapy both within the NHS and privately. Nicola also has a BSc in Sport and Exercise Science.
 - f) This work has been submitted to the International Federation of Orthopaedic Manipulative Physical Therapists (IFOMPT) and currently awaiting outcome of these abstracts.
 - g) ETHICS: This study gained NHS ethical approval, HRA approval and individual site confirmation (17/WA/0421/IRAS 229790).

h) ABSTRACT

TITLE: Participants with features of central sensitisation have greater pain and disability at six months following musculoskeletal trauma: an exploratory study

AUTHORS: **Nicola Middlebrook**, Alison Rushton, Deepa Abichandani, David W Evans, Marco Barbero, Nicola Heneghan, Deborah Falla

PURPOSE: Following musculoskeletal trauma, a high proportion of people develop chronic pain, irrespective of the severity of injury. Central sensitisation (CS) characterised by features such as secondary hyperalgesia, tactile allodynia and widespread pain, could offer an explanation to the transition from acute to chronic pain. No study has evaluated early features of CS in this population. This exploratory study aimed to investigate features of CS, alongside other measures such as pain, quality of life and psychological features, soon after musculoskeletal trauma and explore whether these features are more evident in participants who develop greater pain and disability at six months.

METHODS: 25 participants with lower limb fractures were recruited from a major trauma centre within two weeks of injury. To evaluate clinical features of CS, quantitative sensory testing (thermal and pressure pain thresholds and temporal summation) at sites local and remote to injury and pain drawings to quantify pain extent, were collected on two occasions, 48 hours apart. Other measures included the SF-36, EQ-5D-5L, pain intensity, Pain DETECT, the hospital anxiety and depression scale (HADS), Impact of Events Scale – Revised (IES-R) and sleep quality. The Chronic Pain Grade Scale (CPGS) was used to measure pain and disability at six months, with participants classified as low pain and disability (CPGS I) or high pain and disability (CPGS \geq II).

RESULTS: 64% (n=16) of participants were classified as having high pain and disability at six months. Pressure pain thresholds (kPa) were lower at both local (average across sessions CPGS I 426.72 (176.80) CPGS \geq II 338.70 (175.64)) and remote sites (average across sessions CPGS I 485.64 (201.89), CPGS \geq II 397.13 (181.47)) with greater pain extent (average across all sessions CPGS I = 1.59%, CPGS \geq II = 7.06%) suggestive of early features of CS in participants in CPGS \geq II group. Several other measures such as the HADS, IES-R, and pain DETECT were also higher in the CPGS \geq II group.

CONCLUSION: Over 50% of participants following lower limb fractures irrespective of type of fracture or severity experience greater pain and disability at six months. Reduced pain thresholds and greater pain extent are suggestive of early features of CS in those experiencing greater pain and disability at six months.

IMPACT: This study demonstrates the importance of psychophysical measures such as QST alongside other patient reported measures in the first step to understanding the transition from acute to chronic pain in this population. Future studies evaluating prognostic features

influencing the transition from acute to chronic pain including psychophysical measures is now warranted.

THREE KEY WORDS: Musculoskeletal Trauma, Central Sensitisation, Chronic Pain

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