

Title: Quantitative sensory testing and association with cervical spine radiculopathy disability: Systematic review.

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Take home messages:

- **First systematic review investigating the association between quantitative sensory testing (QST) and disability in adults with cervical spine radiculopathy**
- **From four studies, there was no association between QST and disability**
- **There is a need to complete prospective studies investigating this relationship to enhance our understanding of this condition.**

Thank you to the Musculoskeletal Association of Chartered Physiotherapists (MACP) for granting me the research award level 3. I am grateful for the research funding which has supported the design, development and writing of our systematic review titled: '*Quantitative sensory testing and association with cervical spine radiculopathy disability: Systematic review*'. I would like to extend my gratitude and thanks to Prof. Mick Thacker and Dr. Jan Vollert for their support throughout this project.

We are delighted that our systematic review has been accepted for publication in *Pain and Rehabilitation* journal. In light of the current working conditions in the middle of a global pandemic, we have planned clinical-academic seminar invitations in the *Pain Research Cluster Group* at London South Bank University.

Cervical spine radiculopathy (CSR) prevalence values range between 1.2 to 5.8 per 1000 people and incidence rates range between 0.8 and 1.8 per 1,000 person-years (1-5). CSR is known to have negative impacts for individuals, families, societies and healthcare systems (6-8). It has a complex clinical presentation with variable phenotype expression (9, 10), resulting in a substantial challenge for clinicians to assess and manage optimally (7, 11). CSR is often associated with multiple overlapping co-morbidities including (but not limited too) psychosocial factors such as depression and anxiety symptoms (12-14). Identifying mechanism-based phenotypes of neuropathic pain states (including spinal radiculopathy) may optimise the diagnosis classification and subsequent management strategies (15-17). There is evidence suggesting lower thresholds to thermal, mechanical and vibration detection for individuals with neuropathic pain presentations such as peripheral neuropathy (for example diabetes), carpal tunnel syndrome (18) and other spinal musculoskeletal disorders, for example cervical spine pain (19). Furthermore, lower threshold to thermal and mechanical pain detection thresholds are also reported (20).

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To date no systematic review has been undertaken to determine the association between QST and disability in individuals with CSR.

A systematic review was conducted including searches of PubMed (MEDLINE), EMBASE and CINHAL. Quantitative studies investigating CSR populations with QST measurements and association with disability were included. One reviewer conducted the search strategy. Two reviewers independently assessed eligibility of all search results and completed methodological quality assessment using a modified Downs and Black checklist. Data were analysed narratively.

Four studies were included for review (19-22). The quality of these studies was high. There were no statistically significant associations between QST and disability among people with CSR. This systematic review fulfilled the aim of investigating the association between QST and disability in people with CSR. QST protocols and further prospective studies involving patients are likely to enhance our understanding of the clinical presentation of CSR. Further, there is a need to standardise CSR diagnostic criteria.

Reflections and learning points.

Our narrative (descriptive) analysis was based on four heterogeneous studies. Despite this, our search strategy was rigorous including large electronic databases, grey literature, hand searching and expert author contacts. Secondly, the measures of disability varied across the included studies and included neck disability index, disability of arm and shoulder and pain disability index. Greater consistency between these measures of disability may have enhanced the analysis and improved external validity to clinical populations. The patient populations across the four studies varied in CSR diagnostic criteria and healthcare locations. Greater consistency and enhanced transparency of CSR diagnostic criteria may have improved the generalisability to clinical practice. Furthermore, only one study recruited from primary practice which limits its application to clinicians working in this setting.

We will continue to ensure that a clear and transparent record of decision making is made for all team members to access, trust a 'critical friend' to provide observations to protocol and final write up and, importantly, continue to acknowledge how valuable reviewers comments are to enhance manuscript submissions – a special thank you to the Pain and Rehabilitation editorial and reviewing team, a pleasure to work with.

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Thank you again to the MACP for supporting the research ambitions of it's members, particularly early career researchers. I would be very happy to support members considering applying for future MACP research awards.

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