

Altered resting state neuromotor connectivity in men with chronic prostatitis/chronic pelvic pain syndrome: A MAPP Research Network Neuroimaging Study

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JJ Kutch, MS Yani, S Asavasopon, et al

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Monika Stefanowicz

Subjects

Three groups of subjects were recruited: healthy men from USC (n = 14), healthy men (16) & men with CPP (chronic pelvic pain) (16) from UCLA, and health men (11) & men with CPP (12) from NWU. Health men and men with CPP from UCLA and NWU were grouped together for analysis. Healthy men had no history of pelvic pain or dysfunction, men with CPP reported symptoms >3 months (pain, urological dysfunction, sexual dysfunction). Healthy men were younger than males with chronic pelvic pain but this was not a significant factor.

Was the assignment of patients randomized? No

Were groups similar at the start of the trial? Age was similar between groups (UCLA & NWU) and mean duration of symptoms were similar between both groups of men with CPP. Healthy controls were younger but age did not impact calculations.

Study design / method

Healthy controls performed 30 sec bouts of pelvic floor contractions and right first dorsal interossei (FDI) to map the area of the motor cortex responsible for activation.

Functional MRIs were performed on healthy men and men with CPP during 10 mins of rest.

Oxford Centre for Evidence grading scale = level 3

Aside from the allocated treatment, were the groups treated equally? N/A not an intervention study

Outcome measures used: Genitourinary Pain Index, Brief Pain Inventory

Blinding

Subjects - No

Treating therapists - N/A not an intervention study

Assessors - Yes, assessors did not perform fMRI

Assessing the outcome

Were all patients who entered the trial accounted for – intention to treat. Unclear, did not state

Is the dropout rate acceptable - Unclear, did not state

Treatment effect - no treatment effect, but reported effect size

Results

Patients with CPP had more areas of pain (on body maps) and decreased patterns of connectivity between the motor cortex for pelvic floor function and the right posterior insula at rest. (The posterior insula receives input from the spinothalamic tract related to homeostasis [pain, temp, itch, local oxygen status, and sensual touch]). Pain intensity, but not urological symptoms or quality of life, was positively correlated with this connection, meaning that men with more severe pain had decreased connections than men with less pain.

Conclusion

Patients with CPP have altered motor control compared to healthy controls.

Discussion Points

Some therapists have noticed a dominance in left sided pain in men, which may be related to: anatomy (sigmoid colon, other left versus right differences), habits such as driving (which is right leg dominant), and pelvic obliquities.

If the connection can be altered in individuals with pain/dysfunction, can it be altered back to norms with intervention? Will it always stay dysfunctional? These are questions to be answered with future research, which should include fMRI prior to treatment and post treatment. At this time it is unclear whether the connection contributed to the development of pain or whether pain led to the decrease in connection.

Since the motor cortex is activated differently for PFM than for the hand, should we be exercising the PFM differently? Current practice applies orthopedic exercise dosing principals for skeletal muscle to the pelvic floor. We already treat differently in some regards. Are there better ways? Again, we require further research to answer these questions. Should we be training patients to practice pelvic floor exercises with a full bladder to provide variance in training?

Some patients with chronic pain are hyper-interoceptive and focus on every single visceral sensation. Others have no awareness of their visceral or pelvic floor function. The question becomes, how much awareness is "good"? Do we run the risk of *making* people hyper-interoceptive if we focus all the attention on their bowel and bladder habits? What's the fine line?

Discussion Questions

- What kind of autonomic (sympathetic) changes do you see in patients with CPP? Do you see differences between males to females?
- Interesting that the posterior insula, which integrates viscerosensory information was correlated with increased pain intensity, but not urological symptoms. I wonder if this would be different when isolating patients with interstitial cystitis vs other chronic pelvic pain disorders? This research shows us the central processing alterations which occur in the male CPP population! So how does this impact treatment?
 - What do you think of the suggestion for repeated transcranial magnetic stimulation over

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the motor cortex?

- How do you think this type of connection could impact movement? (i.e. think “nerves that fire together, wire together”) **Makes me consider that**
- How does this information affect your treatment? I use visceral mobilization, relaxation training, and downtraining in this patient population.
- Interesting that viscerosensory areas were correlated with pain, but not the anterior areas which integrate cognitive and affective aspects with motor control. Do you address the cognitive/affective domains of patients with CPP? How so?
- Do any of you use the GUPI scale with patients? Pros/cons versus NIH-CPSI?