Psychosomatic

Stiffness in the back in people with chronic back pain

Stiffness in the back: is it really there?

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This series of experiments demonstrates that experiencing stiffness in the back does not reflect its actual biomechanical properties. Instead, feeling stiff involves multiple sensory systems meddling perception, serving a protectory purpose.

It was shown that: 1) there is no difference in objective measures of back stiffness between people who are feeling stiff and people who are not; 2) those who are feeling stiff overestimate forces to their spine, but on the other hand are better in detecting changes in applied force; and 3) this process of interference can be modulated using auditory cues synchronous to applying forces.

Most of the times, we simply assume that what we feel is an accurate representation of the current state of our tissues. Even more so, when the sensation (e.g., pain or stiffness) is felt in a distinct physical location. However, this "bottom up" idea of somatic input that elicits physiological reactions which are in turn influencing cognitive functioning has become more and more offset: awareness may be able to manipulate physiological control of specific body tissues.

Fifteen people with chronic low back pain (CLBP) and feelings of stiffness, and 15 healthy controls were included. For all 3 experiments, a custom device that is able to administer a standardised force while measuring displacement of its probe – and thus measure objective stiffness – was used.

In experiment 1a, objective stiffness was compared with perceived stiffness as measured on a numeric rating scale (NRS) and between those with and without feelings of stiffness. Experiment 1b consisted of a force magnitude estimation and a force difference detection task – again, the results of both groups were compared. In experiment 2, participants completed a force estimation task, while auditory input was given simultaneously to try to modulate the perception of stiffness.

No significant correlations were found between perceived stiffness and objective stiffness, and there were no significant differences in objective stiffness between those who had back pain and feelings of stiffness and the controls.

People with feelings of stiffness did overestimate the forces applied to their spine, and were better able to detect changes in forces. This can be seen as a protective response, which prevents excessive range of motion or sudden movements that can cause re-injury.

Finally, synchronous auditory input influences feelings of stiffness, underlining the important and very much two-way interaction between sensory input and bodily awareness.

Expert opinion

This research group has used an elegant series of experiments to test hypotheses arising from previous studies, that are questioning nature of the previously established link between sensory input and perception.

Although the results may not be so surprising, because they have become increasingly speculated on in recent literature, they provide hard evidence that our approaches of managing chronic low back pain should be reviewed ? and that there may very well be unorthodox ways of engaging other sensory input that can be considered as a serious treatment option.

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