Sensory trick efficacy in cervical dystonia is linked to processing of neck proprioception

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BACKGROUND
Muscle vibration activates muscle spindles and when applied over posterior neck muscles during stance modulates global body orientation. This is characterised by a tonic forward sway response that is reportedly diminished or absent in patients with idiopathic cervical dystonia.

OBJECTIVE
To investigating the impact of the sensory trick on vibration-induced postural responses.

METHODS
20 patients with idiopathic cervical dystonia and a sensory trick, 15 patients without a trick, and 16 healthy controls were recruited. Neck muscle vibration was applied bilaterally over the upper trapezius under three different conditions: 1) Quiet standing; 2) standing while performing the trick (or trick-like movement in non-responders); 3) standing while elevating the flexed arm without touching any part of the body. Centre of pressure position and whole-body orientation in the sagittal plane were analysed.

RESULTS
Patients with a sensory trick responded similarly to healthy controls: neck muscle vibration led to an initial forward sway of the body that slowly increased during the prolonged vibration for all three conditions. This response was mainly mediated by ankle flexion. In patients without a trick, the initial sagittal sway was significantly reduced in all three conditions and the later slow increase was absent. Performance of the trick did not have an effect on any aspect of the response in either cervical dystonia group.

CONCLUSIONS
The whole-body response to neck vibration in cervical dystonia differs depending on the effectiveness of the sensory trick to alleviate the dystonic neck posture. Variable pathophysiology of proprioceptive processing may be the common factor.
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