Impaired eye blink classical conditioning distinguishes dystonic patients with and without tremor

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INTRODUCTION
Tremor is frequently associated with dystonia, but its pathophysiology is still unclear. Dysfunctions of cerebellar circuits are known to play a role in the pathophysiology of action-induced tremors, and cerebellar impairment has frequently been associated to dystonia. However, a link between dystonic tremor and cerebellar abnormalities has not been demonstrated so far.

METHODS
Twenty-five patients with idiopathic isolated cervical dystonia, with and without tremor, were enrolled. We studied the excitability of inhibitory circuits in the brainstem by measuring the R2 blink reflex recovery cycle (BRC) and implicit learning mediated by the cerebellum by means of eyeblink classical conditioning (EBCC). Results were compared with those obtained in a group of age-matched healthy subjects (HS).

RESULTS
Statistical analysis did not disclose any significant clinical differences among dystonic patients with and without tremor. Patients with dystonia (regardless of the presence of tremor) showed decreased inhibition of R2 blink reflex by conditioning pulses compared with HS. Patients with dystonic tremor showed a decreased number of conditioned responses in the EBCC paradigm compared to HS and dystonic patients without tremor.

CONCLUSION
The present data show that cerebellar impairment segregates with the presence of tremor in patients with dystonia, suggesting that the cerebellum might have a role in the occurrence of dystonic tremor.

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