Use of soleus H-reflex for the study of upper motor neuron dysfunction in patients with amyotrophic lateral sclerosis

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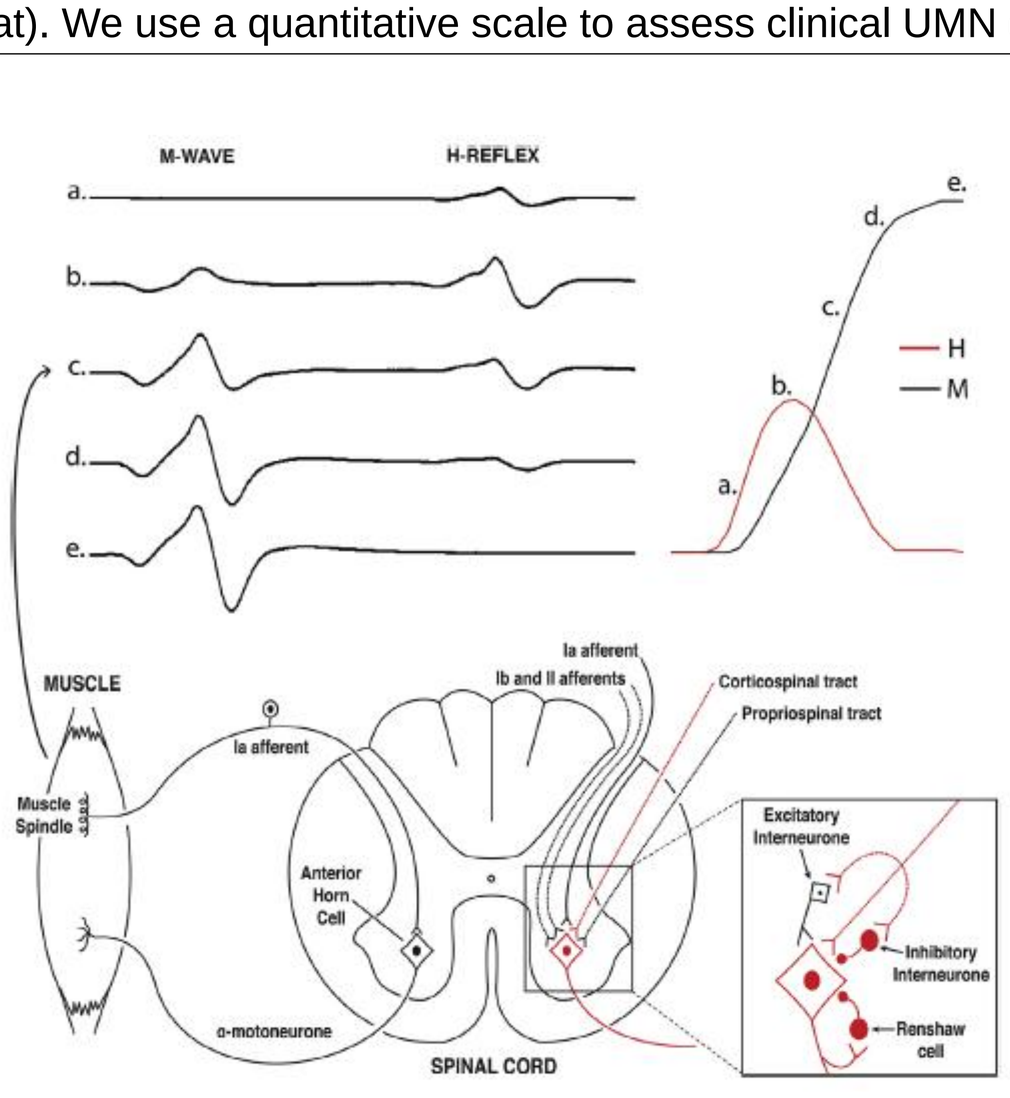
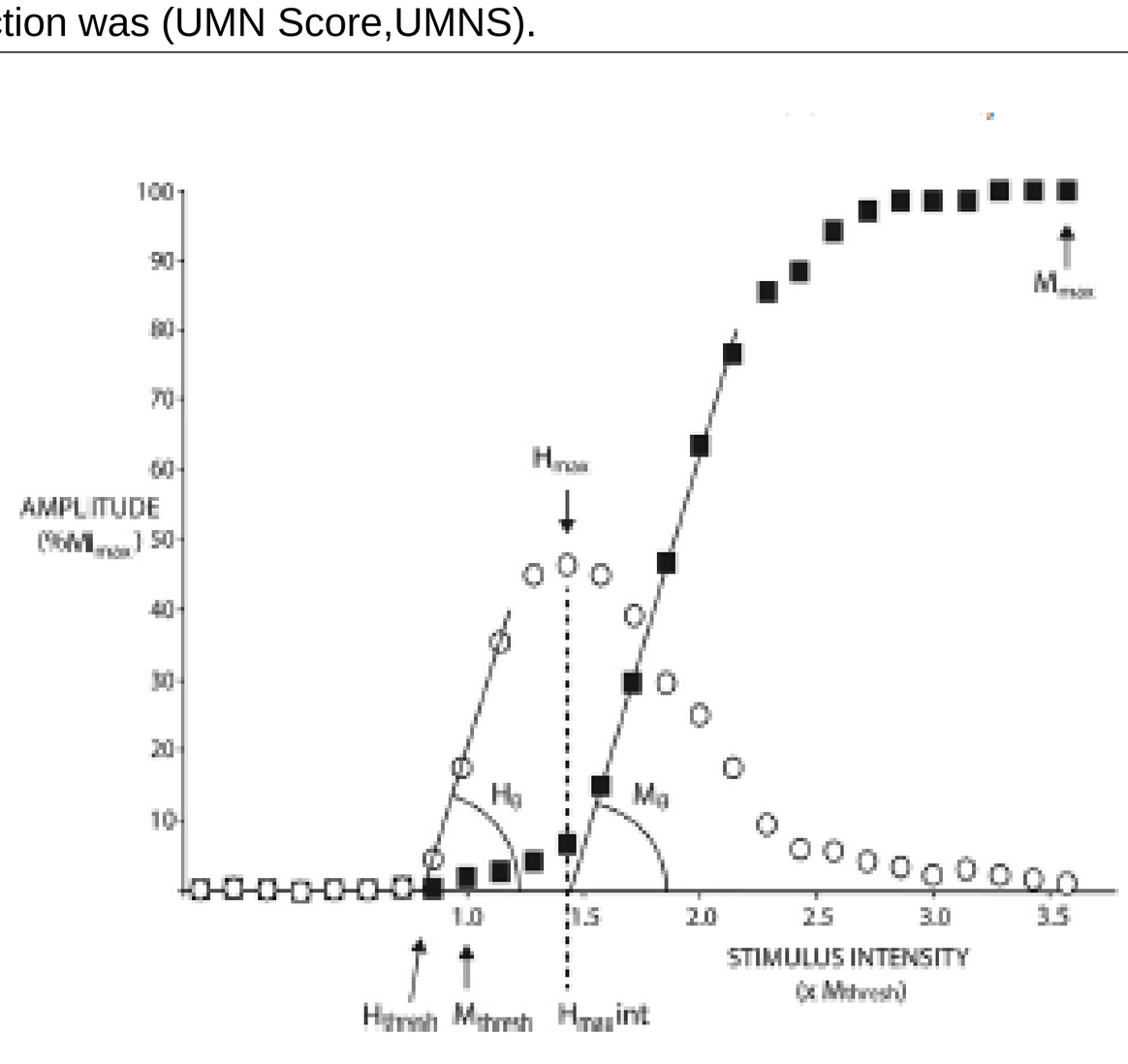
Background and purpose: Clinical evidence of upper and lower motor neuron degeneration is fundamental to the diagnosis of amyotrophic lateral sclerosis (ALS). Is known that clinical evidence of upper motor neuron involvement may be difficult to detect, particularly when coexistent lower motor neuron signs are prominent. Simon and colleagues recently suggested that segmental motoneuronal dysfunction is a feature of ALS. According to their methods, we tested the soleus H-reflex in ALS to evaluate its potential use as a measure of upper motor neuron dysfunction.

Materials and methods: Recruitment curves of bilateral soleus H-reflex and M-wave were recorded in 40 patients with ALS and 20 age-matched control subjects. Analysed parameters included maximal H-reflex amplitude (Hmax), maximal compound muscle action potential amplitude (Mmax), Hmax:Mmax ratio (Hmax/Mmax), minimal stimulus intensities to produce a H-reflex (Hthresh) and M-response (Mthresh), stimulus intensity at Hmax (Hmaxint), latency of Hmax (Hlat), latency of Mmax (Mlat), and Hlat minus Mlat (H-Mlat). We use a quantitative scale to assess clinical UMN dysfunction was (UMN Score,UMNS).





Results: H-reflex in ALS patients were detected in 74 of 80 of limbs (92,5%). Lower motor neuron signs were prominent in the limbs in which H-reflex were not detected. Mmax and Hmax were reduced, while Hlat, Mlat and H-Mlat were prolonged in ALS patients when compared with controls.

Conclusions: Our preliminary data suggest that soleus H-reflex could be a good diagnostic standard to test the upper motor neuron dysfunction in ALS patients, improving the accuracy of ALS diagnosis, especially in patient in which clinical signs of upper motor neuron damage is not prominent.