



Normal interhemispheric inhibition in persistent developmental stuttering

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Introduction

Persistent developmental stuttering (PDS)

- frequent (1 % of adults; male : female = 4 : 1)
 - unknown origin
 - right hemispheric (pre)motor overactivity (PET)^{1, 2} but
 - left hemispheric timing abnormalities between areas of language preparation and execution (MEG)³
 - impaired communication of language-related areas⁴
- ↳ Impaired inter-hemispheric communication?

Material and Methods

- 15 male subjects with PDS (mean age 26.7 years), no cluttering.
- 13 male controls matched for age, sex, and years of education.
- Measurement of
 - Interhemispheric inhibition⁵
 - Ipsilateral silent period⁶

Results

- Unchanged interhemispheric inhibition
- Unchanged ipsilateral silent period

Conclusions

- Normal interplay between the motor cortices of either hemisphere in patients with PDS.
- Consistent with a normal *intracortical* inhibition previously described in PDS patients.
- Abnormal right (pre)motor activity observed in imaging studies on PDS are not likely to reflect altered primary motor cortex excitability, but are likely to have a different origin.

References:

1. Fox P.T. et al., Nature 382, 158 (1996). 2. Braun A.R. et al., Brain 120, 761 (1997). 3. Salmelin R et al., Brain 123, 1184 (2000). 4. Sommer et al., Lancet 360, 380-83 (2002) 5. Interhemispheric inhibition measured using a two-coil technique with the conditioning pulse over the hand area of one and the test pulse over the hand area of the other hemisphere while the hand muscles were at rest. test pulse adjusted to yield amplitudes of about 1.0 mV in the abductor digiti minimi muscle, conditioning pulse intensity adjusted to yield amplitudes of about 1.5 mV. Interstimulus intervals of 2, 5, 6, 8, 10, 20, 50, and 80 ms studied 10 times each, and unconditioned test stimuli 20 times. Conditioned MEP amplitudes normalized to unconditioned ones. Repeated-measures ANOVA with "interstimulus interval" and "side" as within- group and "group" as between-group factors. 6. Ipsilateral silent period studied using a one-coil technique over the hand area of one motor cortex during voluntary activation of the ipsilateral abductor digiti minimi muscle. Stimulus intensity adjusted to yield MEP amplitudes of about 2 mV contralaterally. Duration of the induced ipsilateral silent period obtained from 30 rectified trials was measured and compared between groups using unpaired, two-tailed t-test. Each side was investigated separately, and the data were analyzed using a repeated-measures ANOVA with "side" as within- group and "group" as between-group factors.

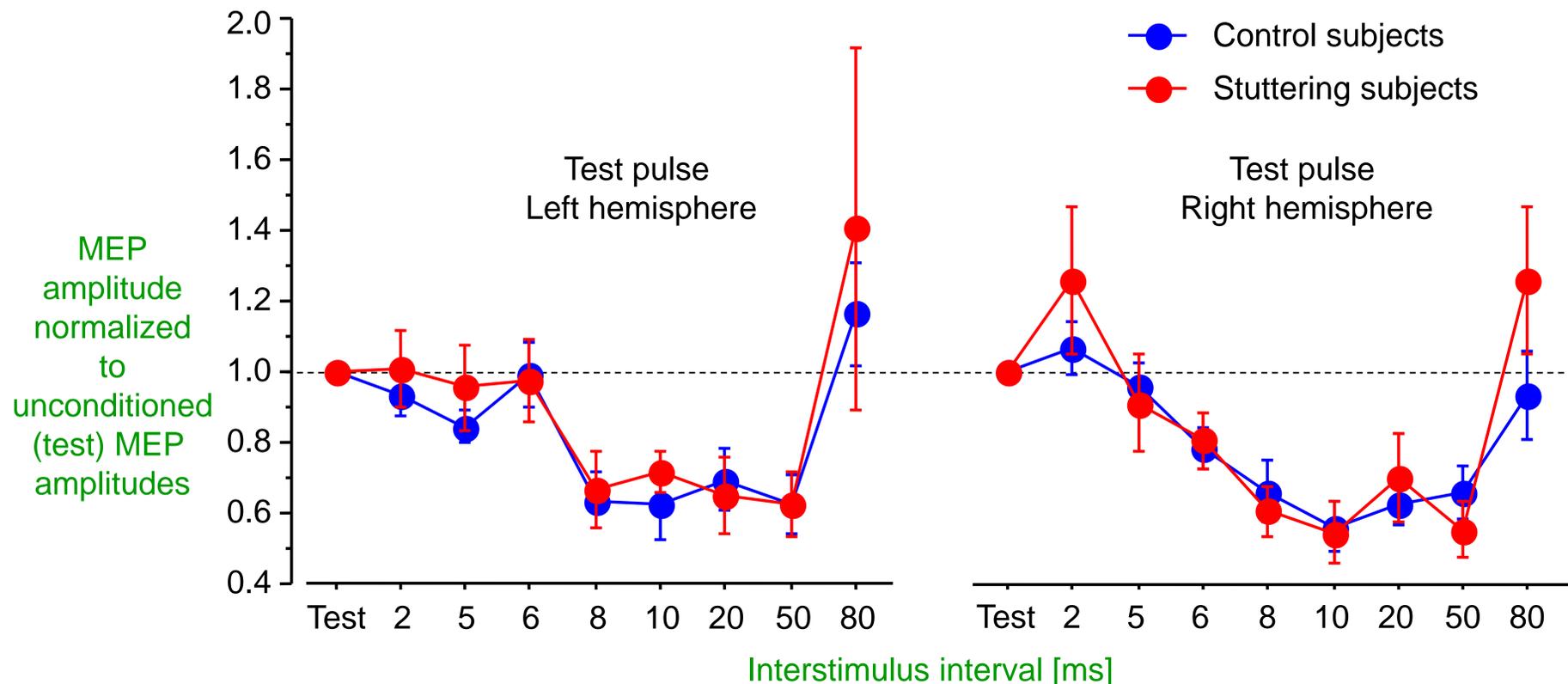


Figure 1 Interhemispheric inhibition in both groups, mean +/- SE.

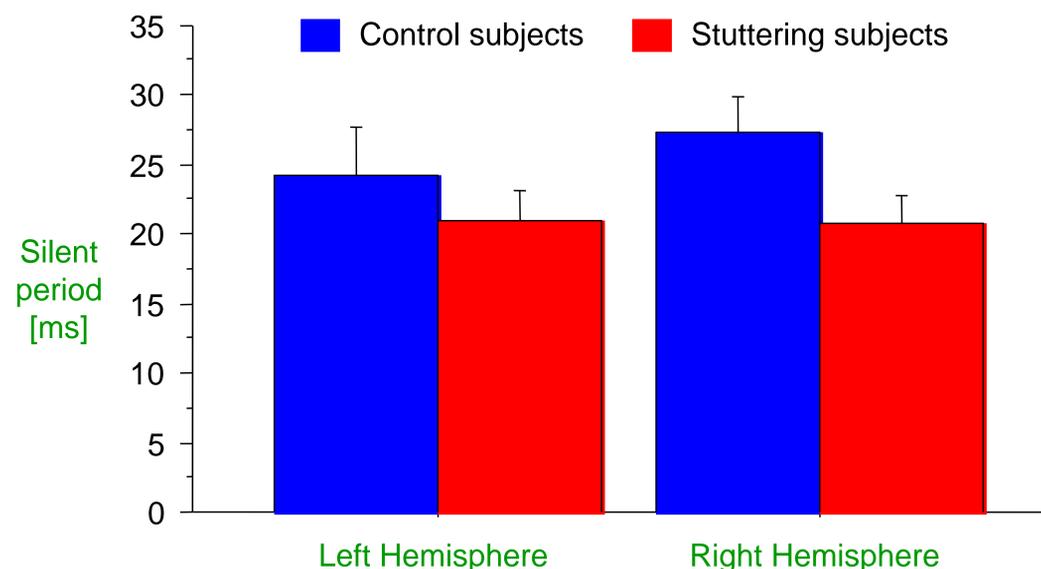


Figure 2 Ipsilateral silent period in both groups, mean +/- SE.