Analyzing cervical postures in patients with episodic cervical headache: An alternative approach

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Background

Habitual cervical postures vary considerably between individuals. Such heterogeneity impedes cross-sectional comparing of postures among individuals or groups. Postural measurements therefore often do not detect differences between a clinical-and control-group, causing doubts on the importance of postural re-education. Alternative procedures are needed to evaluate an individual posture since we do know that even small postural changes can increase loading on spinal tissue. It seems therefore more relevant to describe a patient's habitual posture referred to the maximal range of motion. The relative position of the habitual posture can increase load on passive and active structures if located towards end-range.

Methodology

Design. A pre-post design was set up to compare the habitual cervical posture (HCP) relative to the maximal active cervical flexion (MCF) between 18 females with episodic cervical headache (23.8±1.8 years) versus 18 matched asymptomatic controls (23.6±2.2 years). The ratio HCP/MCF was calculated before and after a writing task. The study was approved by the Medical Ethical Committee of the 'Ziekenhuis Oost-Limburg' (B371201423025).

Criteria. Headache-group (HA) inclusion-criteria: females between 18-30 years, IHS-criteria for episodic tension-type headache, headache provoked by posture. Control-group (C) inclusion-criteria: asymptomatic matched females. General exclusion-criteria: pregnancy, physiotherapy for headache 12 months before the study, serious pathology and a history of trauma.

Measurements, Outcomes and Instrument. Active MCF and the HCP, measured with the Cervical Range of Motion device (°), were primary outcomes.
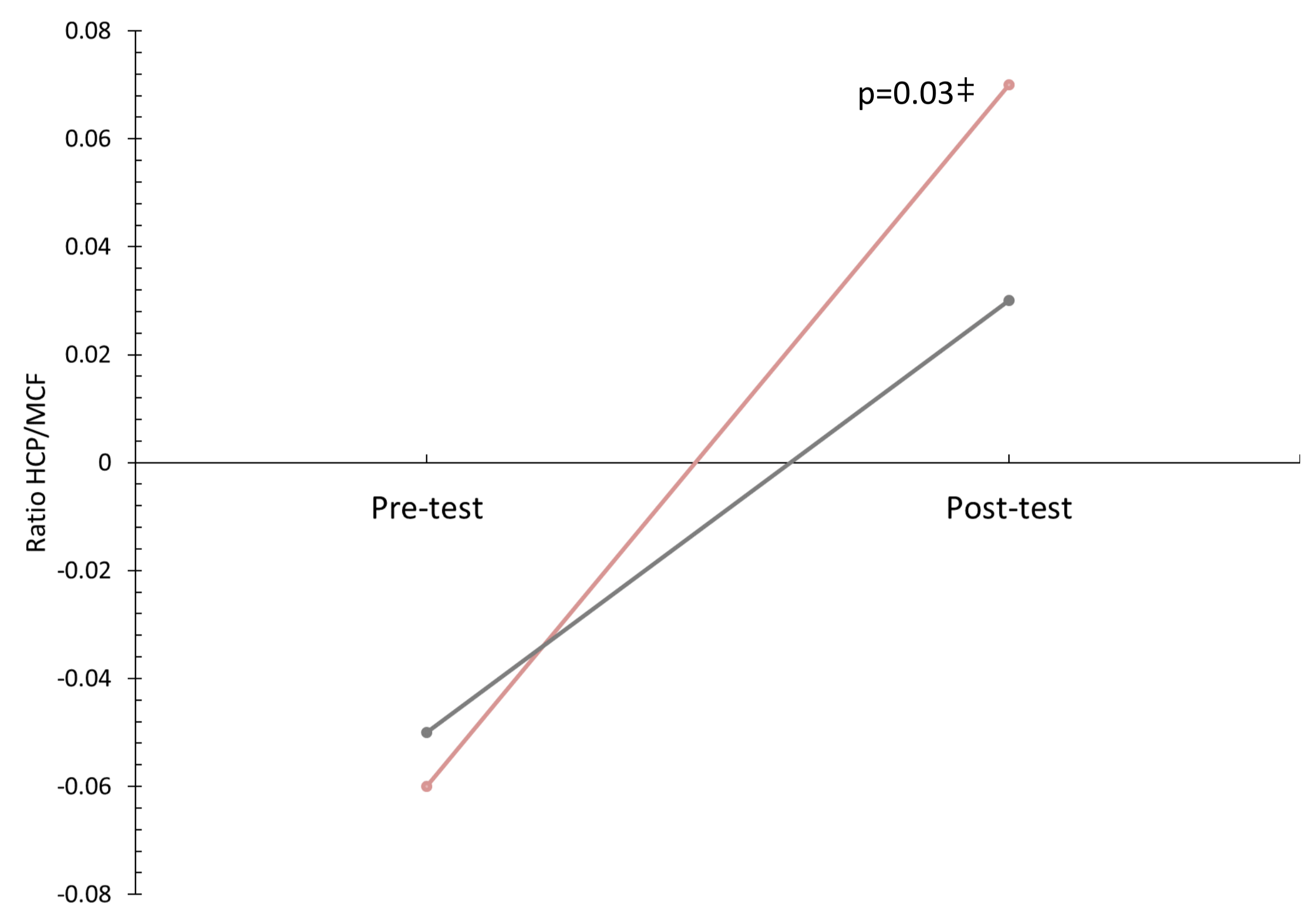
Results

### Classic 'absolute' approach
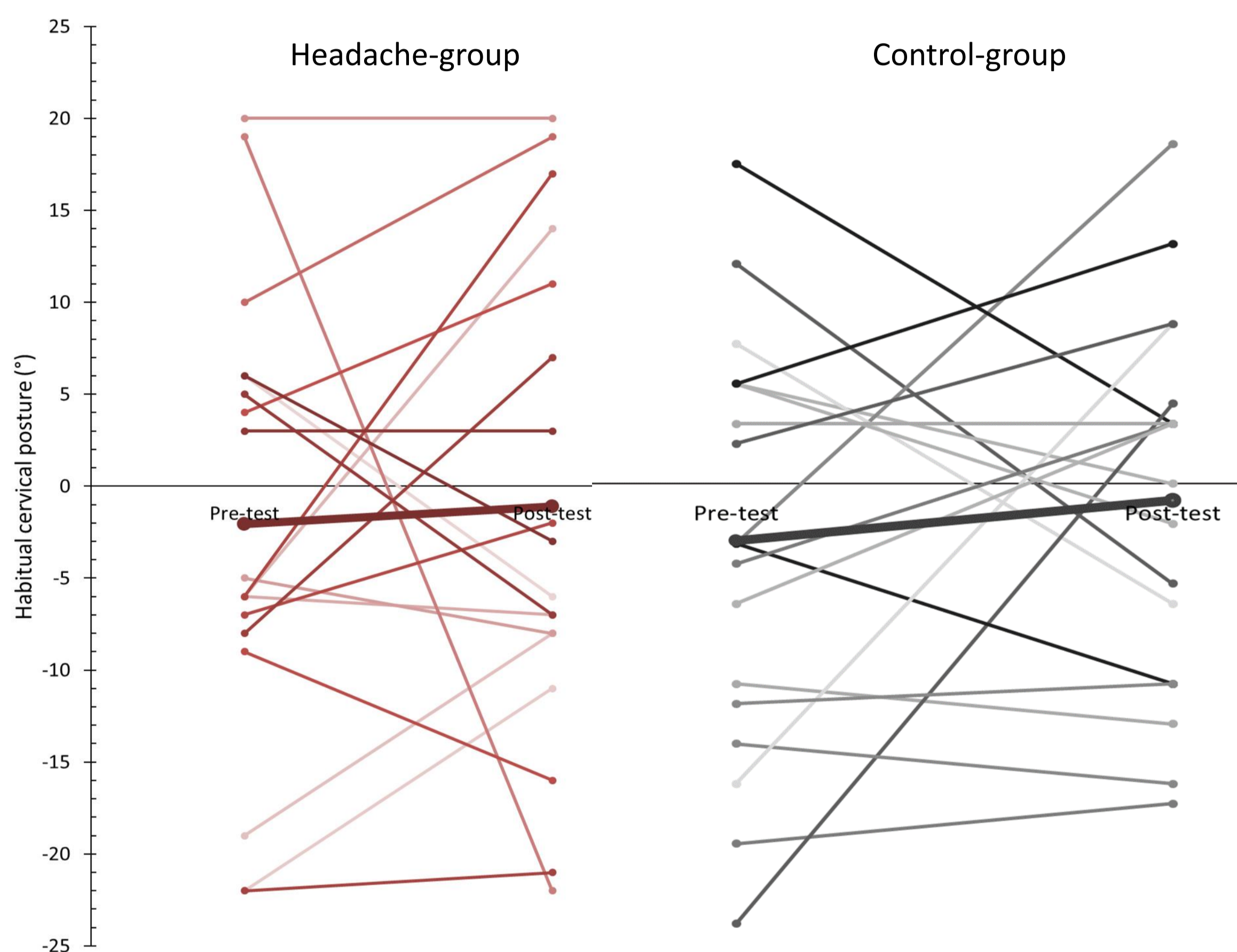
Figure 1a. Comparison of the individual HCP between the HA-and C-group revealed *no cross-sectional nor longitudinal differences* (HCP, habitual cervical posture; °, degrees; thick line, average)

Alternative 'relative' approach

Figure 1b. Comparison of HCP/MCF from pre-to post-test in the HA-and C-group (Headache, red; Control, grey; ‡, significance p<0.05)

Baseline Correlation HCP and MCF
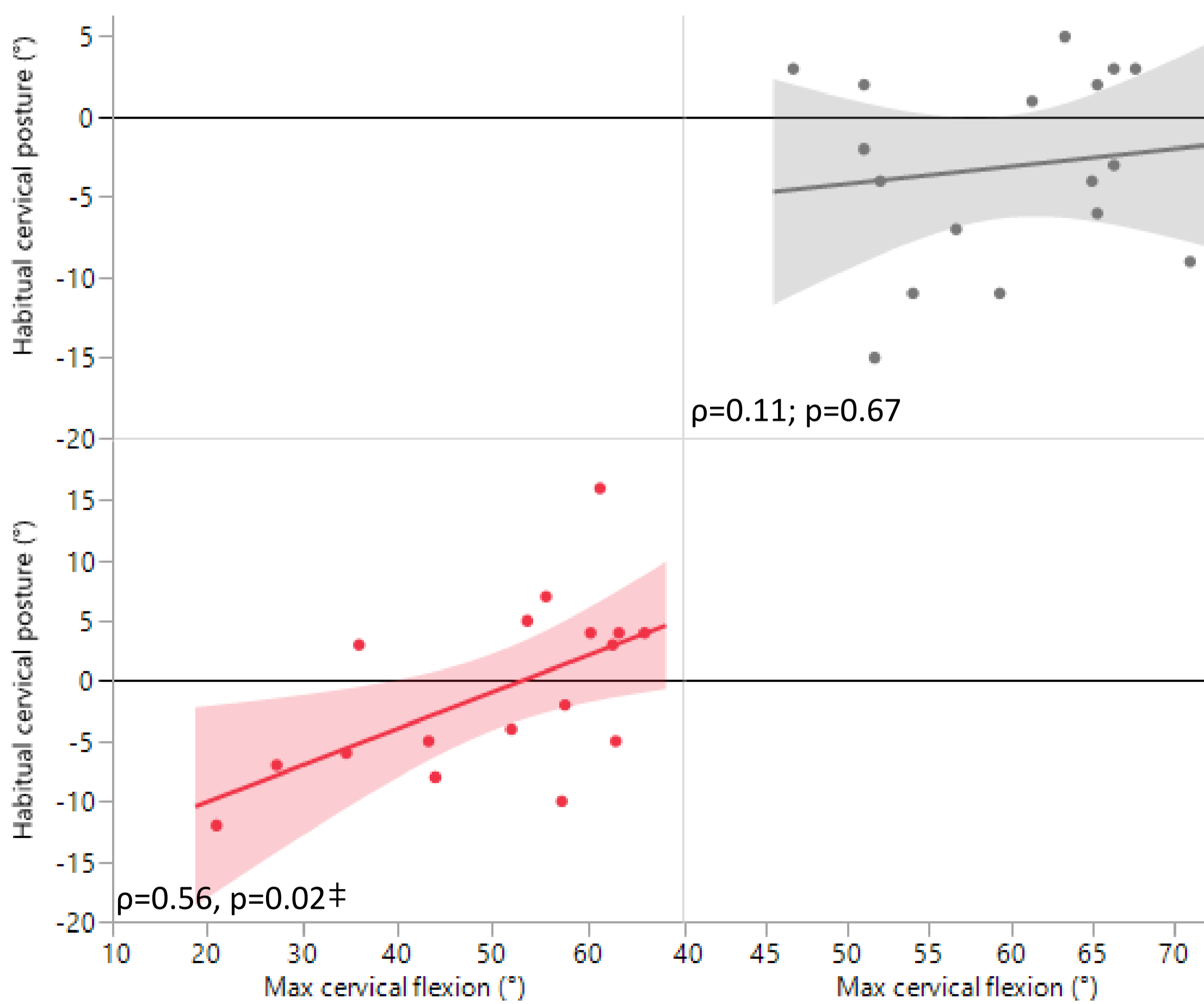
Figure 2a. Correlation HCP and MCF in the HA-and C-group (HA, red; C, black; HCP, habitual cervical posture; MCF, maximal active cervical flexion; °, degrees; ‡, significance p<0.05; ρ, Spearman's rho)

Post-test Correlation HCP and MCF
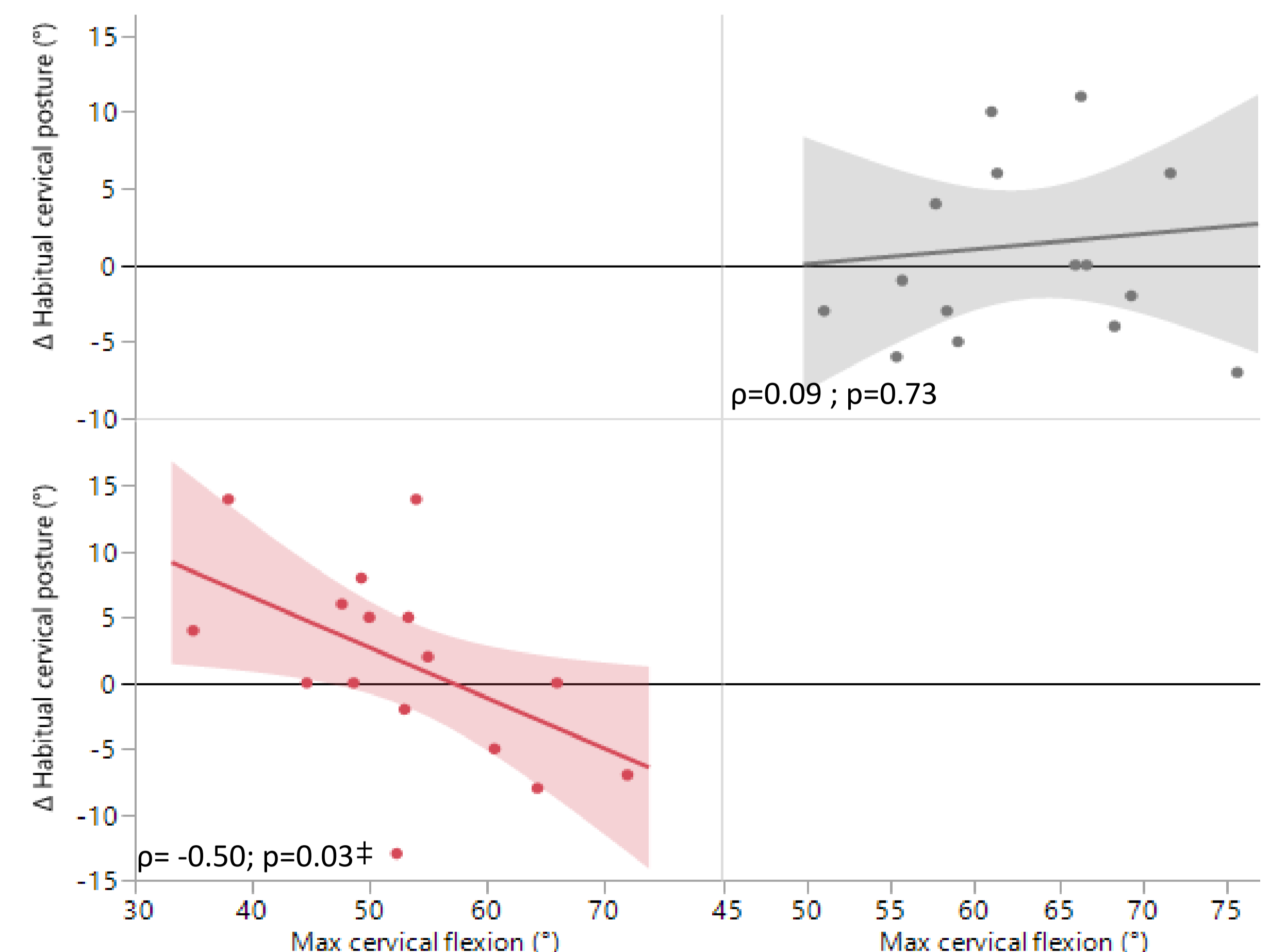
Figure 2b. Correlation HCP and MCF in the HA-and C-group after the writing task (HA, red; C, black; HCP, habitual cervical posture; MCF, maximal active cervical flexion; °, degrees; ‡, significance p<0.05; Δ, post minus pre; ρ, Spearman's rho)

Conclusion

No cross-sectional nor longitudinal differences were revealed for the HCP between a HA-and C-group. However, when the ratio HCP/MCF was considered, episodic cervical headache patients differed from controls by showing a significant (p<0.05): (1) change in the ratio HCP/MCF from pre-to post-test, (2) positive correlation between the HCP and MCF at baseline and (3) shift to a negative correlation between the HCP and MCF after the writing task.

Take home messages

- Patients and controls cannot be differentiated based on their habitual cervical posture; independent of the design (cross-sectional vs. longitudinal)
- Longitudinal measurements of habitual cervical postures referred to the end-range can detect small postural changes in patients with episodic cervical headache
- Pre-post designs seem relevant to observe changes in postural behavior in patients with episodic cervical headache

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