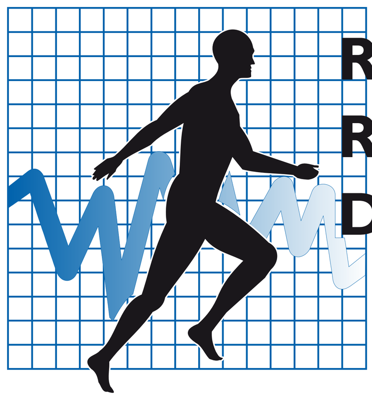


Roessingh
Research and
Development

Institute for Research in Rehabilitation Medicine and Technology

An ambulant treatment for neck-shoulder pain

BACKGROUND AND AIMS

The Cinderella hypothesis provides an explanation for how neck-shoulder complaints may arise and perpetuate during physically low-demanding work, like computer work. It suggests that low threshold motor units are overloaded and damaged when muscles are continuously activated even at a low level, below awareness of the subject. This damage contributes to development and persistence of pain. Among many factors a lack of muscle relaxation might be caused by non-optimal postures and stress. An ambulatory myofeedback system was developed that warns the subject in such situations, when muscle relaxation is not sufficient.

METHODS

The Myofeedback system

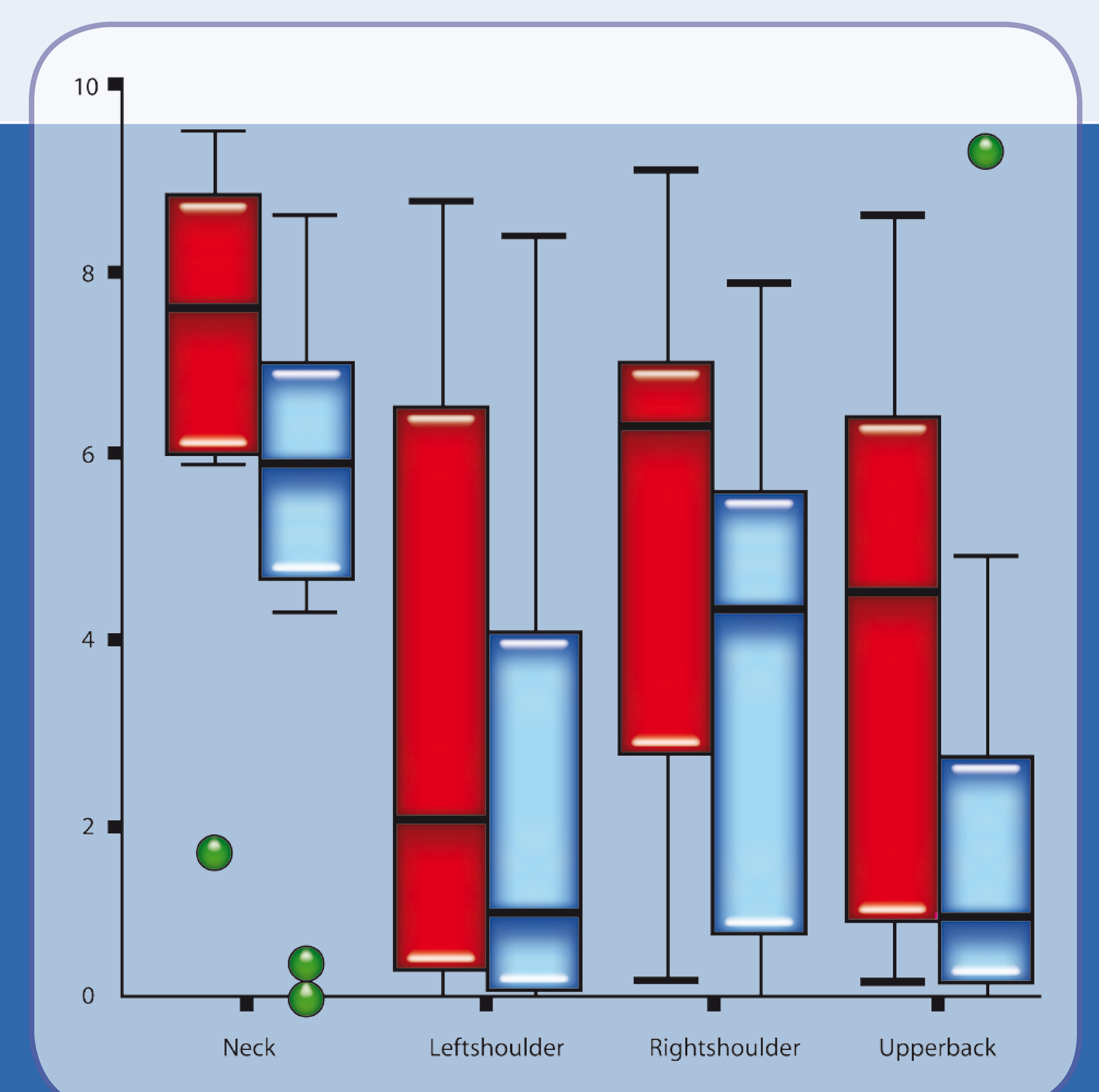
The myofeedback system, based on the Cinderella-hypothesis, consists of a garment with embedded sEMG electrodes (see picture 1) located at the upper trapezius muscles, worn under the clothes during daily activities, like work. A small case, worn at a belt, contains the sEMG processing and feedback unit. Personal feedback is provided by means of vibration and a soft sound when the relative muscle rest time is below 20% within a certain time frame. The system is used for 4 weeks for at least 8 hours a week. During this period, the subject meets a therapist every week to discuss progress.

Prognostic cohort studies are conducted in subjects with work-related neck-shoulder pain (n = 21) and subjects with neck-shoulder pain after a whiplash (n=14). A randomised quasi-controlled trial is performed to compare myofeedback training combined with ergonomic counselling (n=41) with ergonomic counselling alone (n=38) in subjects with work-related neck-shoulder complaints.

RESULTS

Pain intensity in the neck-shoulder region and disability significantly decrease after four weeks myofeedback training (see figure 1) and this effect is lasting, till at least 6 months after the intervention. In approximately fifty percent of the subjects the improvements are clinically relevant.

The myofeedback training does not significantly add to ergonomic counselling except for subjects who ignore their pain sensations. The underlying mechanism of the myofeedback training concerns cognitive changes rather than changes in muscle relaxation, and this is comparable to the mechanism underlying ergonomic counselling.



Pain intensity (VAS) prior to and after four weeks of ambulant myofeedback training in WAD patients

CONCLUSIONS

Ambulatory myofeedback training allows a rather high intensity treatment in the subjects' own environment and is effective for the treatment of neck-shoulder pain, especially in the subgroup of patients characterised by maladaptive coping strategies. By cognitive restructuring, myofeedback training may make subjects aware and change cognitions and related behaviour.

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