

## Effects of dry needling at tender points for neck pain (Japanese: katakori): near-infrared spectroscopy for monitoring muscular oxygenation of the trapezius.

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### Abstract

**BACKGROUND:** Neck pain (katakori) is a common symptom in adult Japanese people. However, the pathophysiological aspect of this condition has not been well documented to date. The purpose of this study was to investigate the effects of tender point dry needling to the trapezius muscles and the resultant changes in muscular hemodynamics. **METHODS:** "Neck pain" patients were defined as those complaining of dull pain or discomfort mainly along the trapezius muscles without serious spinal or shoulder disorders. We used near-infrared spectroscopy to monitor the changes of oxyhemoglobin (oxyHb) and deoxyhemoglobin (deoxyHb) of the trapezius muscles and a Visual Analogue Scale (VAS) to assess subjective neck pain intensity. **Experiment I:** Nine subjects with "neck pain" and four control subjects were recruited. Total hemoglobin (Hb) and SdO<sub>2</sub> [= oxyHb/(oxyHb + deoxyHb)] were measured before and immediately after needling for 15 min. We compared these parameters and VAS before and immediately after needling. **Experiment II:** Thirteen subjects with "neck pain" were instructed to perform isometric contraction of their trapezius muscles for 1 min; the half-recovery time of SdO<sub>2</sub> (defined as T(R)) was measured. After that, all subjects underwent needling. On the next day, we repeated the measurements of T(R) after the same voluntary contraction of the trapezius muscle in the same patients. We compared T(R) and VAS before and on the day after needling. **RESULTS:** Experiment I: All subjects with "neck pain" reported significant pain relief ( $P = 0.0147$ ) measured by VAS immediately after needling, but total Hb and SdO<sub>2</sub> exhibited no significant change after needling. Experiment II: T(R) was shortened on the day after needling in 10 of 13 patients ( $P = 0.0043$ ), and neck pain was decreased in 12 patients ( $P = 0.0158$ ). **CONCLUSIONS:** After dry needling, total Hb and SdO<sub>2</sub> did not change in real time, but T(R) was shortened on the next day. These results showed that the shortening of T(R) would provide a measure by which to assess the effectiveness of treatment for neck pain.