EMG evaluation of abnormal thoracic paravertebral muscles on palpation.

Vannucchi Viberto, Ascione Fabio, Anula Alameda Nieves, Siniscalchi Simona, Porcelli Flavio

BACKGROUND AND AIMS

In (1), Korr e Denslow showed the existence of the relationship between abnormal palpation landmarks and baseline monolateral paravertebral hypertonia, with muscle EMG hyperexcitability to mechanical stimulations. Despite the lack of evidence, the increase of segmental muscle activity has been considered, for long time, the fundamental basis of tissue alteration characterizing the somatic dysfunction physiopathology.

Recently (2), these results have not been confirmed, arguing that there are no statistical differences in EMG activities between abnormal and normal vertebral levels. Ondottiatric research (3), though new data, hypothesized a brainstem sensitization mechanism rather than a mere spinal facilitation chain already postulated by Korr (1) and Magoun (4).

The aims of the present study are to demonstrate the hypertonicity state as key element of somatic dysfunction; to evaluate the hyperexcitability state of the dysfunctional vertebral; to detect a possible spinal-loop, spinal-trigeminal and trigeminal-spinal transmission.

METHODS

The study was conducted at AIOT (picture 3) on N=22 subjects (table 1). To perform the study an EMGs device (k7 Myotronics-Noromed) with superficial patches was used (picture 1). Three couples of electrodes were positioned on the thoracic column vertebrae; one of them was on a vertebra with somatic dysfunction (SD), another one on a vertebra without somatic dysfunction (NSD) and the last on a vertebra without somatic dysfunction considered as a control indicator (VC). Moreover, other three couples of electrodes were positioned on stomatognathic muscles.

Data recorded were relative to: baseline with no stimulation; trigeminal stimulation were positioned on stomatognathic muscles. Data were recorded considering as a control indicator (VC). Moreover, other three couples of electrodes were positioned on stomatognathic muscles.

RESULTS

At baseline no statistical significant difference between the RMS value of SD and NSD, as well as between right and left side of the SD. The hyperexcitability test revealed that in 13 out of 22 cases (59%) the mechanical stimulation led to an activation of the SD either by a minor stimulus or producing a response with greater intensity (table 2) with respect to the NSD. In testing the spinal loop transmission, 18 cases out of 44 test (41%) (table 3) produced an EMGs response. In 44 tests (SD + NSD) we noticed spinal-trigeminal transmission in 14 cases (32%) (table 4).

CONCLUSION AND FURTHER DEVELOPMENTS

To sum up, the present work shows that:

1. the study of both the relation hypertonicity – RMS and the trigeminal-spinal transmission asks for a different use of the tools;
2. the preliminary results about the SD hyperexcitability and the spinal-loop (scan 1) seem to validate the Korr and Deslow’s hypothesis;
3. the data on the spinal-trigeminal transmission maintain the hypothesis of the existence of a real transmission and, moreover, they make it possible to export the notion of spinal facilitation at brainstem level (scan 2).

Concluding, the previous preliminary results presented in this work encourage us to continue to investigate the relations, following two main directions: first of all, improving the usage of electrodes in the experiments, in terms of positioning; afterwards, increasing the testing in number of subjects, in order to increase the precision and reliability of the results.

REFERENCES

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