Evaluation of botulinum toxin effects in hemifacial spasm patients: correlation between clinical rating scales and high-speed video system measurements

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Abstract

The purpose of this study was to compare the scores of two clinical rating scales and high-speed video system measurements obtained during spontaneous eyelid movements in hemifacial spasm (HFS) patients before and after treatment. Patients were evaluated before and 30 days after receiving treatment with onabotulinumtoxinA injections. Using a high-speed video system, the eyelid movements were recorded bilaterally for 3 min and the energy power generated by the upper eyelid during spontaneous eyelid movements was assessed before and after treatment. The scores of the Jankovic rating scale (JRS) and Hemifacial Spasm Grading System (HSGS) were also assessed before and after treatment. The authors studied 22 patients. Significant reduction in JRS and HSGS scores and in the energy generated by the upper eyelid was observed after treatment. A power spectrum of less than 23,000 was associated with JRS and HSGS scores less than 4 and 6.25, respectively and a power spectrum greater than or equal to 23,000 was associated with JRS and HSGS scores greater than or equal to 4 and 6.25, respectively ($p < 0.0001$ and $p = 0.0025$). Rating systems are easy to use, but they may exhibit limitations in sensitivity to assess differences between distinct disease patterns and between subtle differences in treatment responses. The high-speed video system permits a greater degree of accuracy, which allows for the assessment of differences in eyelid movement patterns and would permit better tailoring of treatment to patients. However, simpler devices employing this system would need to be developed, so that it could be used in clinical practice.

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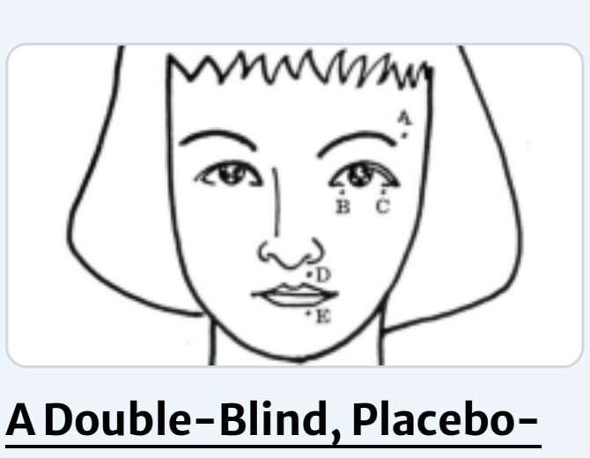

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Contributions

THO: (1) Research project: A. Conception, B. Organization, C. Execution; (2) Statistical Analysis: A. Design, C. Review and Critique; (3) Manuscript Preparation: A. Writing of the first draft; B. Review and approval of the final version. MHO: (1) Research project: A. Conception, B. Organization, C. Execution; (2) Statistical Analysis: C. Review and Critique; (3) Manuscript Preparation: B: Review and Critique; approval of the final version. DG: (1) Research project: C. Execution; (2) Statistical Analysis: A. Design, B. Execution; Manuscript Preparation: B: Review and Critique; approval of the final version. TO: (1) Research project: B. Organization, C. Execution; (2) Statistical Analysis: C. Review and Critique; (3) Manuscript Preparation: B: Review and Critique; approval of the final version. LEO: (1) Research project: C. Execution; (2) Statistical Analysis: C. Review and Critique; (3) Manuscript Preparation: B: Review and Critique; approval of the final version. RB Jr: (1) Research project: A. Conception; (2) Statistical Analysis: C. Review and Critique; (3) Manuscript Preparation: Review and Critique; approval of the final version. AAC: (1) Research project: A. Conception, B. Organization; (2) Statistical Analysis: C. Review and Critique; (3) Manuscript Preparation: Review and Critique; approval of the final version.

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Ethics declarations

Conflict of interest

Tammy H. Osaki declares that she has no conflict of interest. Midori H. Osaki declares that she has no conflict of interest. Denny Garcia declares that he has no conflict of interest. Teissy Osaki declares that she has no conflict of interest. Lilian E. Ohkawara declares that she has no conflict of interest. Rubens Belfort Jr declares that he has no conflict of interest. Antonio Augusto Cruz declares that he has no conflict of interest.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the UNIFESP IRB (number 1322/2016) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent

Informed consent was obtained from all individual participants included in the study.

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