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## A Nonrandomized Trial of the Effects of Near-Infrared Photobiomodulation Therapy on Bell's Palsy with a Duration of Greater Than 8 Weeks

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### Abstract

**Objective:** To determine whether photobiomodulation therapy (PBMT) by class IV Multiwave Locked System laser treatment as an adjunctive therapy could relieve symptoms in patients with Bell's palsy with a duration of greater than 8 weeks. **Materials and methods:** This nonrandomized controlled trial was conducted from January 2020 to December 2022. Patients were eligible if they had Bell's palsy with a duration of greater than 8 weeks at the out-patient department of otorhinolaryngology in Beijing Tongren Hospital. The control group consisted of patients recruited between January 1, 2020, and December 31, 2020. The PBMT group consisted of patients recruited between January 1, 2021, and December 31, 2022. In this study, the PBM used has a wavelength of 808 and 905 nm, 1.2 W power (808 nm is 1 W, 905 nm is 200 mW), continuous mode emission (808 nm) and pulsed mode emission (905 nm), 8.35 J/cm<sup>2</sup> dosimetry, administered 3 times per week, 72 times of total treatment. The primary outcome measures included the House-Brackmann facial nerve grading system, the Sunnybrook facial grading system, and the Facial Clinimetric Evaluation Scale (FaCE). Secondary outcome measures comprised electroneurography, electromyography, and the blink reflex. **Results:** A total of 54 participants were included (27 in the control group and 27 in the photobiomodulation group). After 6 months, the House-Brackmann grading system [risk difference, -0.59, confidence interval (95% CI), -0.81 to -0.38, relative risk, 0.27, 95% CI, 0.13-0.56,  $p < 0.001$ ], Sunnybrook facial grading system (21.14, 95% CI, 11.71-30.58;  $p < 0.001$ ), and FaCE (-0.20, 95% CI, 0.41-0.02;  $p = 0.07$ ) had significant difference between the two groups. Latency of ala nasi muscle (10.92, 95% CI, 5.58-16.27;  $p < 0.001$ ) was not statistically significant after treatment compared with the control group; however, most of the electrophysiological examinations have significant difference between the two groups, respectively. **Conclusions:** The results of this study suggest that PBMT may relieve symptoms for patients with Bell's palsy with a duration of greater than 8 weeks. Trial Registration: ClinicalTrials.gov Identifier: [NCT05585333](https://clinicaltrials.gov/ct2/show/study/NCT05585333).

**Keywords:** Bell's palsy; EMG; ENoG; a nonrandomized trial; class IV laser; photobiomodulation.

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