

Title: Novel Physical Therapy Intervention for Pediatric Bell's Palsy: A Case Report

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ABSTRACT:

Background and Purpose:

Bell's Palsy is a rapid, idiopathic, and unilateral weakness or paralysis of the face due to peripheral damage of the facial nerve on the affected side^{1,2,3}. Bell's Palsy usually results from a virus^{2,3,4}. Typical symptoms include pain, facial drooping, weakness of facial muscles innervated by the facial nerve, inability to close eyelid on the involved side, dryness of mouth and eye, as well as many other varying symptoms based on the patient^{1,2,4}. The presentation of Bell's Palsy is usually temporary and is associated with those who are pregnant, have a virus, or are immune compromised^{1,5}. The general age of those impacted tends to be between the ages of 15-45^{1,5}. There are no consistent treatment strategies recommended for physical therapy interventions to treat Bell's Palsy¹. Even so, physical therapy is often prescribed. The most common physical therapy treatment is mime therapy, which includes massage, relaxation exercises, inhibition of synkinesis, and expression exercises with the use of mirrors to help execute movements for biofeedback and prevent synkinesis^{1,6}. Many patients will show recovery of the facial nerve function without having any interventions^{1,2}. There is a new device on the market called the NEUBIE (patent pending) by Neufit, which is an electrical stimulation machine. Most neuromuscular stimulation machines utilize alternating current (AC) and there aren't many devices that use a direct current (DC) method. The NEUBIE utilizes a DC electrical stimulation intended to provide neuromuscular re-education, improve mobility, reduce pain, and has been shown to decrease recovery time by at least 50% for many different injuries and post-surgical conditions⁷. The purpose of this case report is to present a treatment intervention strategy of using the NEUBIE (patent pending) DC stimulation device in a pediatric patient with Bell's Palsy.

Case Description:

The patient was a 12-year-old female who presented to outpatient physical therapy with a diagnosis of idiopathic right sided Bell's Palsy. She was diagnosed by a physician a month prior before beginning physical therapy. The patient had no other medical concerns to note. The patient lived at home with her family and was currently in middle school. The patient was also regularly active and played softball. Her main concerns were the right sided drooping of her face, difficulty closing her right eye, facial weakness, pain, and difficulty with drinking from a cup and chewing due to poor muscle coordination. Her facial muscle function was tested and resulted in being moderately severe, severe, or total dysfunction of the muscles. Physical therapy interventions included manual therapy, NEUBIE electrical stimulation, therapeutic exercise, and motor control exercises for 13 weeks.

Outcomes:

The patient had positive improvements in her primary concerns by the end of her treatment. At discharge, the patient had either normal, mild, or moderate dysfunction of the different facial muscles evaluated. From the Sunnybrook facial grading scale, the patient improved from 17% at initial evaluation to 85% at discharge for the composite score. This showed significant improvements in facial symmetry at rest, during movements, and synkinesis.

Discussion:

The patient did make improvements with facial function and symmetry over the course of her treatment. It is unclear if this specific treatment plan enhanced or accelerated the recovery process of Bell's Palsy since it was implemented on a single patient. It is possible these improvements occurred in conjunction with the natural recovery of the facial nerve without a meaningful improvement due to the intervention strategy. The NEUBIE shows promise with targeting the facial nerve for recovery from Bell's Palsy due to the use of the DC targeting the nervous system and decreasing recovery times for injuries. More research is warranted to determine whether the NEUBIE stimulation machine is more effective than other treatment strategies or just waiting for the natural recovery to occur. This would help determine if this could potentially become part of standardized care for patients with Bell's Palsy.

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