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BLUE RIBBON POSTER ABSTRACT

Quantum Theory Treats Neuropathy Better Than Pharmacology

PRESENTED BY PETER M. CARNEY, MD, AT THE ACADEMY'S 2014 CLINICAL MEETING

Tom Watson, DPT, MEd, Academy board member and judge of this year's poster abstracts (left), congratulates Peter Carney, MD on his winning abstract at the Annual Meeting.

Introduction

The principles of the quantum theory (QT) offer an exciting new treatment option for painful peripheral neuropathy (PPN), a devastating disease that affects an estimated 23 million Americans (1-4). Erwin Schrodinger, the Nobel Laureate and one of the founders of the quantum theory, proposed in 1943 that "living matter at the cellular level can be thought of in terms of quantum mechanics—pure physics and chemistry (5)."

According to Hameroff and Penrose, "The term 'quantum' refers to a discrete element of energy in a system, such as the energy E of a particle, or of some other subsystem, this energy being related to a fundamental frequency v of its oscillation, according to Max Planck's famous formula (where h is Planck's constant: E = hv). This deep relation between discrete energy levels and frequency of oscillation underlies the wave/particle duality inherent in the quantum phenomenon. … The laws governing these submicroscopic quantum entities differ from those governing our everyday classical world. For example, quantum particles can exist in two or more states or locations simultaneously, where such a multiple coexisting superposition of alternatives (each alternative being weighed by a complex number) would be described mathematically by quantum wave function (6)."

If we accept the concept that life is a molecular process that operates in accordance with quantum theory, then the more than 50 trillion living cells that make up a human being interact with all the quantum fields in their environment (1). "Cells and intracellular elements are capable of vibrating in a dynamic manner with complex harmonics, the frequency of which can now be measured and analyzed in a quantitative manner by Fournier analysis (7)." This has led to the concept of *quantum resonance induction*, which claims that electrical currents and electromagnetic energy fields administered for pain treatment electronically induce and amplify subatomic particle movements and activity to create healing within cells (1).

Current evidence-based guidelines have established that pregabalin, at doses of 600 mg/day, offers *effective* level A treatment for diabetic peripheral neuropathy (DPN) (8) because of two randomized controlled studies (9,10). In one study, at this dose level, 82 patients reduced their average VAS score by 2.4 points, 39% reduced their pain by at least 50%, but at least 38% had one or more adverse side effects (9). This has led experts in America to caution that the current treatments for DPN and PPN do not relieve pain completely in the majority of patients and most have significant adverse effects that the patient must be advised to expect (11). In fact, European authorities have gone as far as to recommend that future investigations be targeted on new treatment options (12). Using the principles of physics rather than those of pharmacology offers such a new treatment option.

In 2008, Odell and Sorgnard developed a very sophisticated electronic signaling technique they called EST (Electronic Signal Treatment) because it utilized computer controlled, exogenously delivered specific parameter electroanalgesia, which employed both varied amplitudes and frequencies of electronic signals. This technique had profound antiinflammatory effects, including the diffusion of hydrogen ion concentration to reduce tissue acidosis, im-

proving circulation, reducing edema, and increasing cyclic AMP formation to enhance cellular membrane repair and increase cellular metabolism, regenerate axons, and support the immune system (2). They then found that combining a local anesthetic block of bupivacaine improved the clinical effectiveness of EST (3). They called this therapy CET (Combined Electrochemical Treatment), which combined the principles of quantum mechanics with a local anesthetic. Published reports have detailed how electronic current and local anesthetic combination successfully treats pain associated with diabetic neuropathy (13,14). In a study of 101 patients with diabetic peripheral neuropathy, 89% reduced their discomfort by at least 50% and none had any adverse side effects (13).

The following study aims to establish that CET (which is based on the principles of the quantum theory) more effectively and safely treats DPN and other peripheral neuropathies than do current pharmacologic regimens.

Methods and Materials

From March 1, 2010, to February 28, 2013, 98 patients with various forms of PPN received a total of 107 series of CET treatments. The diagnosis was based on the patient's disease, history, symptoms (positive and negative), and physical findings including dysesthesiae, absent deep tendon reflexes, loss of vibratory sensation as measured by a Rydel-Seiffer graduated tuning fork at 128 cycles/second, loss of light touch using the Semmes Weinstein monofilament test, and difficulty with gait and balance.

For the treatment, each patient received 1 or 2 ccs of 0.5% bupivacaine injected close to the sural, superficial, and deep peroneal; posterior tibialis; and saphenous nerves in each foot, followed immediately by application of one of three pre-encoded EST programs that lasted between 15 and 30 minutes. Patients received up to two of these treatments weekly until they either reached a steady state and had good relief of their symptoms or they had a total of 24 treatments. Those who did not respond to at least six treatments were excluded from the study.

Patients rated their discomfort on a VAS score of 0-10 and their ability to function on a Peripheral Neuropathy Function Index (PNFI) score of 0-10. The PNFI describes how the patients' discomfort interfered with their mood as well as 10 different daily functions including their ability to walk, sit, stand, perform daily activities (DA), perform work activities (WA), sleep, relate to their spouse, family, or friends (RELATE), engage in social activities (SA), and enjoy life (EL). The PNFI records essentially the same activities as does the Oswestry Function Index (15,16), considered by many to be the "gold standard" for assessing the impairment of spinal function (15). A PNFI score of 0-20 = mild impairment of function; 21-40 = moderate impairment of function; 41-60 = severe impairment of function; 61-80 = very severe impairment of function; and 81-100 = incapacitated. Each patient's highest VAS and PNFI score recorded during the treatment were compared to their last score to determine the percent of improvement each patient received from CET.

In addition to their response to treatment, the age, sex, and diagnosis of each patient were recorded as well as any treatment complications. These results were then compared in an open label fashion to the published results from double-blinded randomized controlled trials (RCT).

Results

Ninety-eight patients received 107 series of CET treatments. The participants in the study included 49 women (50%) and 49 men (50%) The women's average age was 66 (20-90), and the men's was 66 (40-96). Based on history and physical findings, patients were grouped into five different diagnostic types, including chemotherapy-induced peripheral neuropathy (CIPN), DPN, idiopathic peripheral

CASE STUDY

- **A 34-year-old with ovarian dysgerminona and chemotherapy-induced peripheral neuropathy (CIPN)**
- **CC: "On a daily basis I feel like I'm walking on glass."**
- **Pretreatment VAS: 7, PNFL: 44**
- **Received 17 CETs.**
- **Post treatment VAS: 1.5 (79% decrease in pain)**
- **Post treatment PNFI: 0 (100% improvement in function)**
- **Magnificently ran a marathon three months post CET**

Table 1. VAS Response to 107 CET Treatments for Each Diagnosis

Diagnosis	#/%	=/> 30% VAS decrease	=/> 50% VAS decrease
CIPN	68/63%	47/69%	38/56%
DPN	32/30%	26/80%	20/63%
Idiopathic	16/15%	11/69%	8/50%
Traumatic	5/5%	4/80%	4/80%
Mixed	14/13%	11/79%	8/57%

Table 2. PNFI Improvement for Individual Functions

Function	Avg. Highest PNFI	Avg. Last PNFI	Difference	Avg. Improved
Walking	6.97	3.6	3.37	48.3%
Sitting	4.44	2.22	2.22	50%
Standing	6.72	3.69	3.03	45%
Daily Activity	7.04	3.63	3.41	48.4%
Mood	5.54	2.59	2.95	53%
Normal Work	7.02	3.71	3.31	47%
Sleep	5.51	2.45	3.06	56%
Relations	4.13	2.05	2.08	51%
Social Activity	5.68	2.90	2.78	48.9%
Enjoying Life	6.21	3.14	3.07	49.4%
Total PNFI	59.26	29.98	29.28	49.4%

neuropathy (IPN), traumatic peripheral neuropathy (TPN), and mixed neuropathies.

Patients received an average of 17.6 CET treatments (range was 4 to 50). The average reduction in VAS score was 3.7 points and the average improvement in PNFI was 49.4%. Of 98 patients, 77 rated their pain as reduced by at least 30% (79%); 62 rated their pain as reduced by at least 50% (63%). Table 1 shows the decreases in VAS by diagnostic type. Table 2 shows the improvement in PNFI for individual functions.

There were two adverse events in 1,725 CET treatments. One patient developed a blister at the site of an electrode, and one 91-year-old patient felt faint while receiving an injection.

Conclusions

Research has shown that patients consider a 30% reduction in their VAS score as having their pain *much improved* and a 50% reduction as *very much improved* (17). In this study, which was performed in a prospective manner, the 50% reduction level was chosen as the appropriate level to compare measurements of clinically important improvements with those found in published RCTs.

On average, patients received 17.6 CETs, with the number of treatments ranging from 4 to 50. Four patients stopped after 4 CETs because their VAS had been reduced by 50-100%. One patient with CIPN received 50 CETs because he continued to receive chemotherapy.

The average reduction in VAS was 3.7 points, as compared to the 2.4 point reduction in VAS that was reported for pregabalin (9); this represents a 54% higher reduction in VAS scores with CET than with pregabalin ($P = .00006$). In our study, 77 patients (79%) rated their discomfort as *much improved*, as quantified by a 30% or greater reduction in VAS score. Sixty-two patients (63%) rated their discomfort as *very much improved*, as measured by a 50% reduction in VAS score. In the pregabalin study, 39% of patients who received 600 mg/day of pregabalin rated their discomfort as being reduced by 50% (9). One could say that CET helped 62% more patients achieve a 50% reduction in pain than did pregabalin ($P = .003$).

Besides causing discomfort, PPN seriously impairs patients' ability to function. The study shows that, on average, patients improved their ability to function by nearly 50%, ranging from a 45% improvement in their ability to stand to a 56% improvement in their ability to sleep. Only two of the 98 patients treated with a total of 1,725 CET procedures in this study had even minor complications. One patient developed a blister at the site of an electrode, and another 91-year-old patient felt faint while receiving an injection. In contrast, at least 38% of patients receiving pregabalin reported one or more "adverse events" (8). Thus, CET is associated with at least 95% fewer "adverse events" than is pregabalin (P value approaches 0).

Unlike studies that evaluated the use of pregabalin in treating DPN, this study included patients with five different diagnostic categories. The 32 DPN patients represented 30% of the 107 treatments given. Twenty of these DPN patients (63%) reduced their VAS by 50%. Only 55% of CIPN, CIPN, and mixed diagnosis patients reduced their VAS by 50%, suggesting that most of the patients in this study had conditions more

refractory to treatment than did DPN patients.

Our results demonstrate that CET was 54% to 62% more effective than pregabalin in reducing discomfort and improving function in patients with DPN and was associated with at least 95% fewer adverse events. When further studies confirm these results, then CET must become the accepted standard of care for PPN.

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Peter Carney, MD, PC, has dedicated the last 12 years of his practice to accurately diagnosing the cause and effectively finding treatments for patients who have chronic pain. Five years ago, Robert Odell, MD, PhD, introduced Dr. Carney to the concept that the principles of physics and quantum mechanics play an important role in treating peripheral neuropathy. This paper reports how patients with peripheral neuropathy, over a three-year period, responded to the application of the principles of quantum mechanics.

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