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Improvement in Early Recovery after Endoscopic Carpal Tunnel Surgery with the NeuroGen Nerve Support Supplement

Michael J. Fitzmaurice

Fitzmaurice Hand Institute, Scottsdale, AZ, USA
Email: mfitz70@me.com

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Abstract

Several papers have identified supplements that may relieve symptoms of carpal tunnel syndrome and improve recovery when carpal tunnel surgery is required. 64 patients with clinically and electromyographically confirmed carpal tunnel syndrome were enrolled in a prospective study to evaluate the effectiveness of a nerve supplement on patient rated outcome assessment after carpal tunnel surgery. All the patients underwent endoscopic carpal tunnel surgery. 18 patients also took the NeuroGen nerve supplement as part of their perioperative treatment. Both groups demonstrated a statistically significant improvement in BCTQ (both symptoms and function) at 2 weeks follow up. The supplement group demonstrated a statistically significant difference in improvement on the BCTQ (both symptoms and function) compared to the control group without the supplement. The NeuroGen nerve supplement appears to improve recovery on both the symptoms and function component of the BCTQ after endoscopic carpal tunnel surgery within 2 weeks.

Keywords

Endoscopic, ECTR, Carpal Tunnel, Nerve Supplement, Nerve, Supplement, BCTQ

1. Introduction

Carpal tunnel syndrome is common and often requires surgical intervention for appropriate treatment [1] [2]. Endoscopic carpal tunnel release has shown in multiple studies to provide less scar pain, more grip strength and quicker return to work activity [3]. Although the endoscopic technique has generally shown a quicker recovery our goal was to evaluate if the nerve support supplement Neu-

roGen could further improve recovery. Several supplements have been used to treat patients with carpal tunnel syndrome. These include alpha lipoic acid, acetyl l carnitine, vitamin D and serratiopeptidase [4] [5] [6] [7]. Other ingredients such as alpha lipoic acid, curcumin and B vitamins have been used to help improve outcomes after surgical release of the carpal tunnel [8] [9] [10]. NeuroGen is a nerve supplement which contains ingredients that have demonstrated a significant improvement in nerve regeneration, decreased nerve pain and less inflammation with a faster recovery after surgical procedures [4]-[10]. We have previously published data showing NeuroGen can reduce pillar pain and reduce number of pain medications required after endoscopic carpal tunnel release [11].

The Boston carpal tunnel questionnaire (BCTQ) is a common patient rated outcome assessment given to patients undergoing treatment for carpal tunnel syndrome (**Appendix A**). This assessment consists of 11 items for symptoms and 8 items for function. The minimally important difference in change of score from pre-operative to post-operative has been identified as a 1.14 change in symptoms score and a 0.74 change in function score [12]. Most procedures for carpal tunnel surgery fail to reach this amount of improvement within the first 2 weeks [13] [14] [15]. Several studies evaluating the use of supplements such as alpha lipoic acid, acetyl l carnitine and vitamin D on symptoms of carpal tunnel syndrome have used the BCTQ as a patient rated outcome questionnaire [4] [5] [6]. Other studies have evaluated the effect of supplements on the postoperative recovery after carpal tunnel surgery using the BCTQ as an outcome [8] [9]. None of these previous studies have used a comprehensive formula including several ingredients known to promote nerve healing such as NeuroGen. The goal of this study was to evaluate the effectiveness of the nerve supplement NeuroGen on the patient rated outcomes after endoscopic carpal tunnel surgery using the Boston carpal tunnel questionnaire.

2. Methods

Patients were seen in our clinic at the Fitzmaurice hand institute over a 5-month period in 2014. All patients had carpal tunnel syndrome based on clinical exam, history, and positive diagnostic findings on nerve conduction studies. All patients failed conservative treatment which included NSAIDS, steroids injections, or splints. 64 Patients were then scheduled for endoscopic carpal tunnel release surgery. They were given the option of using a nerve support supplement to improve outcomes and the recovery after the carpal tunnel surgery. 18 patients chose to have the NeuroGen supplement and there were 46 patients who did not have the supplement in the control group. The supplement was taken for 5 days before surgery and continued for 3 weeks after the surgery. The NeuroGen supplement consisted of 6 tablets a day containing various ingredients proven to improve nerve function, decreased nerve pain and improve recovery after surgery. These ingredients include Methylcobalamin, Acetyl l Carnitine, Alpha lipoic acid, N Acetylcysteine, curcumin, benfotiamine, COQ10, bromelain, and

Serratiopeptidase. Patients were evaluated before surgery with the Boston carpal tunnel questionnaire (BCTQ) both pre-operatively and again at first follow up approximately at 2 weeks. The BCTQ was chosen as it is one of the standard patient rated outcome questionnaires to measure outcomes after carpal tunnel surgery procedures. Statical analysis of the data was performed using a paired t-test with XLSTAT software.

3. Results

All 64 patients had the same endoscopic carpal tunnel release performed. None of the patients required conversion to an open procedure or had any intraoperative complications. The follow up evaluation was performed an average of 14 days after surgery. Both the control group and the NeuroGen group demonstrated a statically significant improvement in BCTQ at first follow up in both symptoms and function ($p < 0.005$). Symptom improvement included less hand or wrist pain during day and at night, less numbness, less weakness, and less difficulty grasping and using small objects. Function improvement included ability to write, button clothes, opening of jars, holding a book, household chores, carrying a grocery basket, bathing and dressing and gripping a telephone. There was a statically significant difference in post-operative BCTQ score with those using the NeuroGen nerve supplement compared to the control group at first follow up visit ($p < 0.005$) demonstrating a greater improvement in BCTQ with the supplement group (**Figure 1**) in both symptom and function improvement. The change in score was 1.51 in symptoms and 0.98 change in function from pre-operative score to follow up at 14 days with the NeuroGen group and a change of 0.98 in symptoms and 0.38 in function score in the group without the supplement.

4. Discussion

Several dietary supplements have been used to help improve nerve function and reduce nerve symptoms of nerve dysfunction such as neuropathy and crush syndromes. Alpha lipoic acid is a supplement that has been used in previous studies to reduce pillar pain after carpal tunnel surgery [8]. Other studies have demonstrated that when taken before and continued after surgery for 2 months after surgery, Alpha lipoic acid can also improve clinical and neurophysiological outcomes based on nerve conduction studies [9]. Alpha lipoic acid has also been combined with other ingredients such as curcumin and B vitamins taken before and continued for 3 months after surgery with improved sleep and clinical findings compared to the group without the supplement [10].

Alpha lipoic acid has also been used to treat symptoms of carpal tunnel syndrome without surgery. Alpha lipoic acid was combined with gamma-linolenic acid with significant improvement in patients with early CTS [4]. Acetyl l carnitine is another supplement which has been used to treat patients with mild and moderate carpal tunnel syndrome. After 4 months of treatment there was a

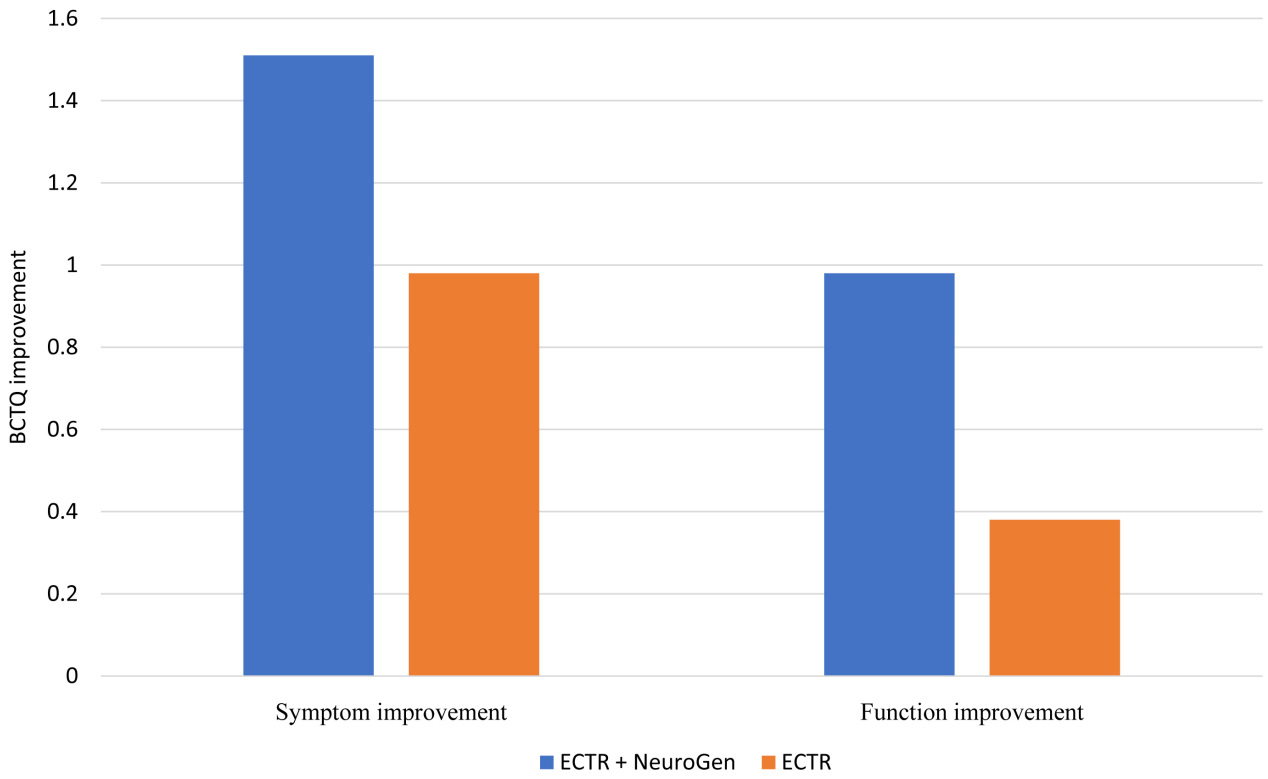

Figure 1. Improvement in symptoms and function after ECTR.

significant improvement in nerve function based on nerve studies, patient rated outcomes of symptoms and function and reduced pain [5]. A review of Vitamin D for treatment of carpal tunnel syndrome demonstrated that supplementation with Vitamin D for at least 12 weeks could provide favorable improvement with improved nerve function on nerve studies for patients with mild-moderate carpal tunnel syndrome [6]. A study was conducted on serratiopeptidase for patients with carpal tunnel syndrome. 65% of the patients demonstrated significant improvement on both clinical evaluation and nerve function based on nerve studies at 6 weeks [7].

A nutraceutical consisting of alpha lipoic acid, acetyl l carnitine, curcumin, and B complex vitamins were given to a group who received therapy for carpal tunnel syndrome and compared to a placebo and therapy group. After therapy both groups demonstrated clinical improvement, however at 3 months after therapy had ended, only the nutraceutical group maintained this improvement [16]. Another combination study used acetyl l carnitine, alpha lipoic acid, quercetin, bromelain, pantothenic acid along with b complex vitamins for 30 days along with physical therapy (20 days) for treatment of patients with early carpal tunnel syndrome and compared to physical therapy without the supplements [17]. They demonstrated continued improvement in nerve function based on nerve studies at 30 and 60 days along with improved sleep in both groups, however there was a significant greater improvement in the supplement group.

NeuroGen is a unique nerve supplement formula designed to enhance nerve

recovery and minimize post-operative inflammation and pain. The ingredients have demonstrated significant improvement in nerve regeneration, decreased nerve pain, improved neural mitochondrial function, neuroprotection and decreased inflammatory response. Methylcobalamin, Acetyl-L–Carnitine, N-Acetyl Cysteine, Vitamin D, and Curcumin improve nerve regeneration in several conditions including nerve injuries (crush), nerve repair after transection and neuropathic conditions such as diabetes [18]-[54]. Bromelain, and Serratopeptidase decrease the inflammatory response and have demonstrated improved recovery after surgery with less pain and earlier return to activity [55]-[68]. NeuroGen was recently given to patients after endoscopic carpal tunnel release to evaluate pillar pain after surgery. There was a significant decrease in pain and reduced number of pain medications needed after surgery compared to the group without the supplement [11].

The minimally important difference in BCTQ scores has been reported to be a 1.14 change in symptoms score and a 0.74 change in function score [12]. That study evaluated patients at 3 months post operatively and our study had demonstrated a greater improvement in the BCTQ score by 2 weeks (1.51 improvement in symptoms score and 0.98 improvement in function score). Most studies fail to demonstrate a clinically important and significant change in outcome scores within 2 weeks and usually require 6 - 12 weeks to obtain a minimally important change [13] [14] [15]. This study demonstrated that patients who took the nerve support supplement NeuroGen had a significant improvement in reducing symptoms and improving function compared to a group who did not take the supplement after endoscopic carpal tunnel release within 2 week follow up. This improvement in BCTQ score using the NeuroGen formula is significantly better at 2-weeks after surgical release than previous studies evaluating only a single ingredient such as alpha lipoic acid, acetyl l carnitine or vitamin D [4] [5] [6] [8] [9].

Limitations of the study include a short follow up period. We chose to focus on the immediate post-operative period and a 2 week follow up to assess the ability of the nerve supplement to decrease the recovery period and subsequently allow patients a faster return to activity. We are evaluating some future studies to include a longer follow up to assess long term improvement using the nerve supplement.

5. Conclusion

Our study is consistent with other authors who have demonstrated improvement after carpal tunnel surgery with various supplements that improve nerve function after injury or decompression surgery. Our study is unique in that it contains a combination of several of these nutraceuticals which appears to provide a greater improvement than individual ingredients. The unique formula in NeuroGen provides greater relief of symptoms and improved function based on the carpal tunnel questionnaire after endoscopic carpal tunnel release within a 2-week follow up period.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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Appendix A

Boston Carpal Tunnel Syndrome Questionnaire (BCTQ)

(1) Symptom severity scale (11 items)

	1	2	3	4	5
1. How severe is the hand or wrist pain that you have at night?	Normal	Slight	Medium	Severe	Very serious
2. How often did hand or wrist pain wake you up during a typical night in the past two weeks?	Normal	Once	2 to 3 times	4 to 5 times	More than 5 times
3. Do you typically have pain in your hand or wrist during the daytime?	No pain	Slight	Medium	Severe	Very serious
4. How often do you have hand or wrist pain during daytime?	Normal	1-2 times / day	3-5 times / day	More than 5 times	Continued
5. How long on average does an episode of pain last during the daytime?	Normal	＜10minutes	10~60 Continued	＞60minutes	Continued
6. Do you have numbness (loss of sensation) in your hand?	Normal	Slight	Medium	Severe	Very serious
7. Do you have weakness in your hand or wrist?	Normal	Slight	Medium	Severe	Very serious
8. Do you have tingling sensations in your hand?	Normal	Slight	Medium	Severe	Very serious
9. How severe is numbness (loss of sensation) or tingling at night?	Normal	Slight	Medium	Severe	Very serious
10. How often did hand numbness or tingling wake you up during a typical night during the past two weeks?	Normal	Once	2 to 3 times	4 to 5 times	More than 5 times
11. Do you have difficulty with the grasping and use of small objects such as keys or pens?	Without difficulty	Little difficulty	Moderately difficulty	Very difficulty	Very difficult

(2) Functional status scale (8 items) :

	No difficulty	Little difficulty	Moderate difficulty	Intense difficulty	Cannot perform the activity at all due to hands and wrists symptoms
Writing	1	2	3	4	5
Buttoning of clothes	1	2	3	4	5
Holding a book while reading	1	2	3	4	5
Gripping of a telephone handle	1	2	3	4	5
Opening of jars	1	2	3	4	5
Household chores	1	2	3	4	5
Carrying of grocery basket	1	2	3	4	5
Bathing and dressing	1	2	3	4	5

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