

## The Successful Treatment of Chronic Pain Using Microcurrent Point Stimulation Applied to Battlefield Acupuncture Protocol

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### ABSTRACT

**Introduction:** Although microcurrent is widely used for chronic pain and stress management, as well as Battlefield Acupuncture (BFA) as a popular approach for the treatment of pain, there remains considerable controversy as to their combined therapeutic value in chronic pain management. We aimed to determine the effect and magnitude that DC microcurrent therapy has when applied to BFA protocol and its effects on a wide variety of non-specific chronic pain syndromes.

**Methods:** This was a cohort study analysis of treatment outcomes pre, post and 48-hour follow-up after Microcurrent Point Stimulation (MPS) was applied to Battlefield Acupuncture Protocol on 40 patients with history of non-specific pain. Evaluations entailed a Standard Protocol baseline (VAS) pain scale repeated pre-post and 2 day follow-up to electro-therapy on a N=40 sample size with a history of chronic pain.

**Results:** The VAS response of a N=40 patient sample with chronic pain electrical nerve stimulation Microcurrent Point stimulation reflected a statistically significant pre-post improvement in shows there was a statistically significant reduction of 4.4500 points or 69% reduction in mean pain levels post BFA protocol, when compared to initial pain levels [95% CI (3.6659, 5.2341);  $p=0.0001$ ]. There was a non-significant increase of 0.1500 points or 7% increase in mean pain levels at the follow up, compared to post treatment levels [95% CI (0.6106, -0.399);  $p=0.692$ ] and a statistically significant reduction of 4.3000 points or 66% reduction in mean pain levels at the follow up, when compared to initial pain levels [95% CI (3.5787, 5.0213);  $p=0.0001$ ].

**Conclusion:** The positive results in this study could will help establish the validity of MPS applied to BFA protocol for other pain conditions of the body.

### Keywords

Battlefield acupuncture, Microcurrent point stimulation, Chronic pain.

### Introduction

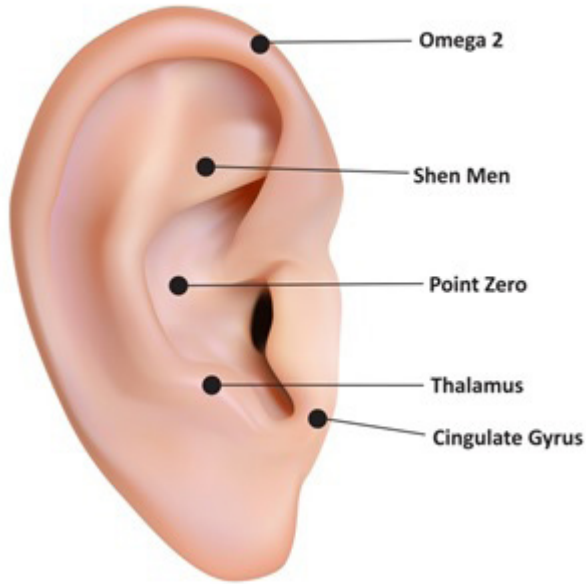
Battlefield Acupuncture [BA] was developed by Col Richard Niemtzow of Andrews AFB as a standardized Protocol to provide a simple, easy to apply, non-pharmaceutical solution for the Military's pain management needs in the clinical and battlefield settings [1-3].

The protocol involves the applications of a stimulus to 5 key acupuncture ear (auricular) points that isolate the ANS & CNS's role in the chronic/acute pain cycle. When these points are collectively treated, it has been reported that a wide variety of neuromyofascial pain syndromes can be effectively relieved in a timely basis. The BFA protocol includes the following points (Figure 1).

Emerging evidence also supports the neurophysiology of acupuncture as modulating the imbalances created by sympathetic and parasympathetic activities in order to alleviate autonomic

responses and reduce pain [4,5]. Microcurrent therapies involve applying weak direct currents (80µA – 1mA), are now being increasingly recognized as an adjunct for pain relief and ANS regulation [6-11]. We have previously reported in a published study the reduction in pain and cortisol with improvements in autonomic nervous system functionality in patients using MPS applied to BFA protocol [9].

### Battlefield Acupuncture Protocol



There is no consensus in the literature identifying the best practice measures for application to Battlefield Acupuncture (BFA) for chronic pain patients. Although sufficient evidence supports the application of acupuncture needles for pain relief and autonomic regulation, there is limited evidence in literature to support the use of electro-therapies to do the same. The purpose of this cohort study is to convey the impact of MPS applied to BFA protocol has on the pain levels of an N=40 patient sample of diffuse chronic pain patients.

### Methodology

Microcurrent Point stimulation (MPS) was applied to Battlefield acupuncture protocol using [12,13] Dolphin Neurostim (Center for Pain & Stress research Ltd., Ontario, Canada) device. This is an FDA-approved non-invasive device that applies low frequency, concentrated, microcurrent stimulation (at 10K ohms) for the relief of chronic pain [7,8]. MPS application time was 30 seconds per point, for a total of 10 points in both ears. Device was set to negative polarity (-).

Visual Pain Rating Scale (VAS) was used to evaluate the patient’s pain. The VAS is an 11-point scale from 0-10 with 0 being no pain and 10 being the most intense pain imaginable [14,15]. The patient verbally selects a value that is most in line with the intensity of the pain that they have experienced in the last 24 hours or is often reported as a rating during a specific movement pattern or

functional task. The VAS has good sensitivity [16], and excellent test-retest reliability [17].

The objective data collection is aimed at revealing:

- 1) Whether Microcurrent Point stimulation when applied to BFA protocol, can modulate VAS pain scale for a sample of N=40 pain patients.
- 2) Whether Microcurrent Point stimulation is a valid option for the non-pharmacological pain management of pain related conditions.

### Subjects and Methods

A total of N=40 patients were recruited suffering with a diffuse range neuromyofascial pain syndrome patients from both sexes were recruited for this study (Table 1). Inclusion criteria was straight forward, patients who were currently suffering from soft tissue chronic pain for greater than 60 days (>= 60 days), with a recorded 3+/10 VAS Pain Scale score. There were 30 female and 10 male, with a mean age of 48.30 (SD 15.443) and 1317.63 (SD 1531.17) mean days of pain (Table 2) The diagnosis of pain, location, severity, sex, previous interventions or surgeries was not considered exclusion criteria.

| Pain Location/ Diagnosis | Total | Percentage |
|--------------------------|-------|------------|
| Back                     | 12    | 30%        |
| Knee                     | 7     | 17.5%      |
| Neck                     | 6     | 15%        |
| Shoulder                 | 6     | 15%        |
| Wrist                    | 2     | 5%         |
| Fibromyalgia             | 2     | 5%         |
| Wrist                    | 2     | 5%         |
| Arthritis                | 2     | 5%         |
| Hip                      | 1     | 2.5%       |
| Elbow                    | 1     | 2.5%       |
| Migraine                 | 1     | 2.5%       |
| Total                    | N=40  | 100%       |

**Table 1:** MPS BFA Descriptive Statistics: Pain Location.

|                                    | N  | Minimum | Maximum | Mean     | Std Deviation | Percentage Change in Mean Pain Levels | 95% Confidence  |
|------------------------------------|----|---------|---------|----------|---------------|---------------------------------------|-----------------|
| Age (years)                        | 40 | 21      | 78      | 48.30    | 15.443        |                                       |                 |
| Duration of Pain (days)            | 40 | 60      | 6205.0  | 1317.625 | 1531.8798     |                                       |                 |
| Pain Before Treatment (0-10)       | 40 | 3.0     | 10.0    | 6.475    | 2.1212        | -69%                                  | Yes<br>P=0.0000 |
| Pain After Treatment (0-10)        | 40 | 0.0     | 7.0     | 2.025    | 1.9998        | +7%                                   | No<br>P=0.692   |
| Follow-up Pain 2 days after (0-10) | 40 | 0.0     | 9.0     | 2.175    | 2.0241        | - 66%                                 | Yes<br>P=0.000  |

**Table 2:** MPS BFA Descriptive Statistics.

## Results

The VAS response of a N=40 patient sample with chronic pain electrical nerve stimulation Microcurrent Point stimulation reflected a statistically significant reduction of 4.4500 points or 69% reduction in mean pain levels post BFA protocol, when compared to initial pain levels [95% CI (3.6659, 5.2341); p=0.0001]. There was a non-significant increase of 0.1500 points or 7% increase in mean pain levels at the follow up, compared to post treatment levels [95% CI (0.6106, -0.399); p=0.692] and a statistically significant reduction of 4.3000 points or 66% reduction in mean pain levels at the 2 day follow up, when compared to initial pain levels [95% CI (3.5787, 5.0213); p=0.0001].

## Discussion

The data in this cohort study clearly shows that the application of Microcurrent Point stimulation to Battlefield Acupuncture protocol provided statistically significantly improved pain outcomes post application and at the two (2) day follow-up. The degree of pain improvement measured post application and at follow-up (69% and 66%) is clearly noteworthy recognizing this procedure had an application time of under 5 minutes per patient, and literature reports that more lengthy applied acupuncture and physiotherapy treatments only produce an average 40-50% reduction in mean pain scores [18,19].

It is suggested that low-amplitude DC current mimics human bio-cellular communications, and its application may produce regulation of the autonomic nervous system, resulting in body wide therapeutic benefits [6,10,20,21]. It is also further suggested that low-frequency DC microcurrent may activate the pituitary to release endorphins [22]. Both these biochemical processes may provide a plausible explanation for the prolonged pain relief after DC microcurrent, and is an area where future research is required. We have previously reported, in several published studies, reduction in pain and cortisol with improvements in autonomic nervous system functionality in patients using MPS [6,10]. It is possible that this same mechanism of action is at play in this cohort analysis, as the pain was not at the same location; this has to be confirmed in other patient studies.

## Conclusion

Chronic pain can limit quality of life, restrict work and social engagement, and is often blamed for the development drug dependency of various forms. The long-term use of opioids is now approaching epidemic levels in many parts of the world, with few viable solutions for treatment in the foreseeable future [23-25]. Treatments like the kind described in this report could have a favorable impact on this problem.

These consistent improvements with pain reduction combined with a short application time suggest a possible significant future role for MPS applied to BFA in the management of pain related diseases either as a clinical adjunctive modality or outside of the clinical setting. However, further investigation is warranted with a

much larger focus group to confirm these results and to assess their duration and potential impact.

## Acknowledgments

Statistical analyses were done by 3rd party freelance statistician using SPSS software.

## Author Disclosure Statement

All the authors whose names are listed in this study have an educational association with the sponsoring company that may create the appearance of a conflict of interest in connection with the submitted manuscript.

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