INTRODUCTION

Two types of pain are common following amputation: phantom limb pain (PLP) and/or residual limb pain (RLP)\(^2\). Regardless of the time from amputation, phantom pain is the most frequently reported type of pain in amputees, and 70-80% of patients report experiencing significant or severe pain\(^2\). The effects of this pain can be debilitating, negatively affecting quality of life, relationships, and the ability to work, along with an increased risk of depression\(^3\). Poor pain management can further impair function by preventing amputees from using prostheses. Medicinal options for treating post amputation pain are often unsatisfactory, with negative side-effects and potential for addiction, and/or misuse\(^4,5\).

Current effective methods for delivering electrical stimulation for PLP treatment are cumbersome, requiring electrodes placed in precise locations\(^2\). Further, patients can expect extreme discomfort during treatment. Other treatments include invasive surgeries and electrodes that need to be worn for days \(^2\).

An Electro-Acuscope is a Transcutaneous Electrical Nerve Stimulation (TENS) device that produces microamperage designed to help restore damaged tissue. Incorporating bio-feedback with a myopulse instrument, this device is programmed to monitor electrical levels in tissue and deliver appropriate microamperage based on the bio-feedback\(^6\). This study investigates the potential of the use of an Acuscope for reducing PLP and RLP, where electrical stimulation is administered on the skin and no adverse side effects or high level discomfort is anticipated.

METHOD

Subjects: Adult patients between the ages of 35 and 75 years old who have experienced PLP and/or RLP for at least one year.

Apparatus: Electro-Acuscope and Myopulse bio-feedback.

Procedures: Subjects will complete a pre-treatment Short Form McGill Pain Questionnaire and a Visual Analog Scale (VAS) for pain. Up to ten treatments will be administered with the Electro-Acuscope and Myopulse instruments. Following each treatment, subjects will be asked to complete a Pain Outcomes Questionnaire – Short Form pain survey, and three months after their final treatment. Surveys were selected based on existing validation\(^4\).

Data Analysis: Appropriate statistical analysis for interval and ratio scales will be used to determine statistical significance in changes to perceived pain levels.

RESULTS

Results will be based on patient self-reports, Three surveys will be used to obtain both interval and ratio level data.

DISCUSSION

In 2005, the estimated number of persons in the United States living with limb loss was 1.6 million and that number is estimated to climb to 3.6 million by 2050\(^5\). It is to the benefit of patients, clinicians, and researchers to continue investigating treatment options for a growing population living with amputations, and suffering from PLP and/or RLP.

CLINICAL APPLICATIONS

This research can be useful for clinical purposes, by studying a potential non-invasive treatment option for patients who are either concerned with side-effects or discomfort with current available treatments, or are not satisfied with previous outcomes. Acuscope and Myopath instruments can be operated by one person, and are transportable.

REFERENCES

4. Price, DD. Pain, 17, 45-56, 1983