

Improved Long-Term Prognosis of Whiplash Neck Injury after Road Traffic Accidents with Low-Level Laser Therapy (LLLT)

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Citation

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Abstract

Introduction

It has previously been reported in the literature [1] that the long-term prognosis of whiplash-type neck injury after traffic accidents is guarded, with 8% of victims unable to return to their normal activity levels more than one year after traffic accident, due to pain and neck stiffness. The present clinical prospective cohort consisted of 280 patients all having Type II Quebec Task Force Whiplash Injury [2] all treated solely with LLLT treatment for average mean of 6 months, on a monthly basis only. The clinical efficacy of LLLT in tackling these problems in pain reduction yet without the need of high frequency of weekly treatment is a blessing to most of these younger subjects that run a busy city life, not to mention our finding that none of the 280 subjects suffer long-term disability at the one-year mark. A monthly treatment regimen is made possible by dint of the fact that LLLT has long-lasting bio-modulation effects not only anti-inflammatory effects; some of the bio-modulation effects are manifest only at the 2-3 months mark[3]

INTRODUCTION

It has previously been reported in the literature [1] that the long-term prognosis of whiplash-type neck injury after traffic accidents is guarded, with 8% of victims unable to return to their normal activity levels more than one year after traffic accident, due to pain and neck stiffness. The present clinical prospective cohort consisted of 280 patients all having Type II Quebec Task Force Whiplash Injury [2] all treated solely with LLLT treatment for average mean of 6 months, on a monthly basis only. The clinical efficacy of LLLT in tackling these problems in pain reduction yet without the need of high frequency of weekly treatment is a blessing to most of these younger subjects that run a busy city life, not to mention our finding that none of the 280 subjects suffer long-term disability at the one-year mark. A monthly treatment regimen is made possible by dint of the fact that LLLT has long-lasting bio-modulation effects not only anti-inflammatory effects; some of the bio-modulation effects are manifest only at the 2-3 months mark[3]

MATERIALS AND METHODS

The study period spans from 2016 to 2021, consisting of patients attending the wellness pain centre of Hong Kong. The male:female ratio was 3:1 and the mean age was 32 (range 20 to 59). All patients consented to the once monthly treatment regimen as they are pleased that this arrangement minimize disruption to their busy schedule in daily life. LLLT was provided by a GaAIs semiconductor device emitting 810 nm wavelength, 5.4 J per point, and power density of 20 mW/cm² was used and the duration of application of LLLT over the painful site(s) of the Cervical Spine, was 480 seconds administered on by a scanning mode to the axial cervical spine and the nearby trapezius without the use of other oral medications. Exclusion criteria included patients with previous neck injury, patients with injury to other parts of the axial skeleton, patients belonging to other categories of Quebec Task Force classes of whiplash neck injury, for instance patients with neurological signs need MRI examination, lastly subjects are excluded if they have bony fractures or displacement in their cervical spine x-ray on initial presentation.

Serial assessment of levels of pain and cervical spine motion were taken every monthly follow up to assess the degree of clinical response if any. No other physiotherapy treatments were administered other than FDA approved LLLT devices. The use of control by sham light source was objected by the majority of subjects and thus sham light irradiation was not employed. All patients had minimum follow up of 1 year to assess the long term clinical results in terms of pain level, degree of neck stiffness if any.

RESULTS

All subjects completed the monthly LLLT treatment for a total of 6 sessions without side effects. Treatment failure is defined by failure to obtain pain control or inability to return to normal activity level at the 1 year mark. In this study, there were no defaulters, and 270 out of 280 subjects demonstrated good reduction in level of pain to LLLT. However, 40 subjects out of 280 patients still suffer residual neck stiffness, with range of motion (ROM) attained only 75% of normal range at the end of 6 sessions of treatment.

That said, at the 1 year follow up mark, there was no more pain in all patients, and only 1 subject failed to return to normal activity level at 1 year follow up.

DISCUSSION

Whiplash related neck injury is a definite clinical entity and is can be compensated for instance in the law of New York. LLLT can on the one hand have anti-inflammatory action like non-steroidal anti-inflammatory medications well reported in the literature [4], as well as diming the pain response by its action on peripheral nerves [5]. On the other hand, LLLT has effects not only on the oxidative phosphorylation process of injured body cells [6] but also on modulation of gene expression and growth factors [7]. As

modulation of cellular activities take time, this form the basis of a monthly treatment regimen for these subjects affected by neck pain. Last, but not least important, LLLT has been shown to be effective in treatment of neck pain in general [8]. This paper highlights its use in whiplash related neck injury commonly seen in road traffic accidents.

CONCLUSION

The administration of low-level laser therapy for 6 months on a once monthly basis was shown to be effective in reduction of neck pain and the great majority of patients were found in this prospective study to be able to return to normal daily activity at the 1 year mark, which marks a significant step forward in the long term prognosis of this disorder.

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