Low Level Laser Therapy

Double blind study to assess the effectiveness of the therapy as a treatment for stopping smoking

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Brief description of the project evaluation

The use of electroacupuncture to assist nicotine withdrawal has been used successfully in this clinic for the past 10 years. Trials using electroacupuncture have been summarised by Schwartz [1], It is generally regards that acupuncture, whether from needles or laser, has its effect due to the stimulation of endorphin levels, thereby reducing the physical withdrawal symptoms [2,3,4]. It is always combined with other methods such as behaviour modification , diet stabilisation, mineral supplementation and stress management to achieve more long term effect. However in these trials it was used on its own to evaluate the short term benefits of laser stimulation of acupoints compared to placebo in the initial 2 weeks of stopping smoking, when physical symptoms are most pronounced..

The aims of Tony Harrison's study were several:

- to determine the effectiveness of laser therapy to successfully stop smoking compared to placebo
- if there was a significant effect whether this was dose dependent
- assess the pattern of reduction in cigarette intake with laser or placebo with no benefit of counselling or support

This report outlines some of the key findings which it is hoped will improve treatment protocols for already established clinics offering the treatment.

Details of the study

Base Unit:	Omega 3ML		
Wavelength and power:	820nm 100mW		
Treatment per point:	Placebo		1 minute
	24 J/cm^2		30 seconds
	48 J/cm^2		1 minute
Energy Density per point:	24 J/cm^2	or	48 J/cm^2
Energy per point:	3 J	or	6 J
Total Energy:	36J	or	72 J
Pulsing repetition rate:	20 Hz		
Number of points:	3 auriculor points:		Lung, Shen Men, Addiction
	3 body points:		LU9, P6, LI4
	Total 6 points bilaterally		
Frequency of treatment:	Day 1, Day 3, Day 5, Day 14		
Number of patients:	TOTAL		**36**
Cost:	Patients recruited from local advertising and received the treatment free of charge.		
Motivation:	All participants indicated motivation from:		
	1. I know I should stop although I don't really want to		
	2. W would like to stop as long as it is fairly easy to do		
	3. I am keen to stop and I am willing to make the effort		
	4. I am determined to stop as long as the withdrawal effects are not overpowering		
	5. I am absolutely determined to stop no matter what happens		
Counselling:	All were required to complete a standard questionnaire indicating the degree of smoking, health problems, medication, history of stopping with previous withdrawal symptoms. They therefore received exactly the same induction and initial treatment. As part of the design of this study no counselling was offered – the treatment consisted of laser therapy or placebo only.		
Exclusion criteria:	Epileptics, pregnant women and pacemaker patients		
Success criteria:	% reduction in tobacco consumption significant difference between laser and placebo groups		

Reactions to the laser: These were different in the 3 groups:

Placebo:	1 incidence of tingling during treatment and no after effects
24J/cm^2:	3 cases of a sensation of relaxation during treatment
	6 cases of pleasant relaxation for 2-6 hours after
	1 reported dizziness after treatment
	1 reported case of improvement in symptoms of arthritic hand
48J/cm^2	3 cases complained of headaches after treatment 1 lasting 48 hours
	1 had a physical reaction of redness behind the ear below the site of the probe

More negative reactions reported in the 48J/cm^2. However any reactions were short lived and with no lasting negative effects.

Discussion

5 people altogether withdrew from the trial. This was for personal reasons or because they felt it was not worth their continuing. As they were fairly equally distributed between the 3 groups they were discounted.

The results are tabulated – attached. Average values, standard deviations and T Test values are available for comparison. Statistical analysis showed no significant difference between the 24 and 48J/cm^2 groups (t = 0.63) but a highly significant difference between placebo and 24J/cm^2 (t = 8.7) and 48J/cm2 (t = 9.33). The critical value for a probability of 0.005 was t = 2.89

Placebo effect: When examined on a daily basis however the t test showed no significant difference between either group for the first 4 days after stopping smoking. So the real difference came after the initial burst of enthusiasm and determination, but after this the placebo group climbed steadily back to 70% consumption whilst the laser groups maintained a steady consumption average of only 20%. This is a more informative and accurate measure than the actual number of complete cessation at the end of the trial which showed placebo = 0 (0%), 24J/cm^2 = 2 (20%), 48J/cm^2 = 1 (9%)

Motivation: The average motivation showed no significant difference between the groups

Years smoking: There was a significant difference between the groups with the Placebo averaging 14 years, 24J/cm^2 averaging 19.8 and 48J/cm^2 averaging 32 years. You would perhaps expect the 48J/cm^2 group have a harder or an easier time than the other 2 if this was a factor. The results show a significant difference between both the 48J/cm^2 and the 24J/cm^2 compared to placebo. So length of time smoking is either not a relevant factor or the laser provides a positive effect no matter how long the participant has been smoking.[5]

Withdrawal symptoms: Smokers were asked to report their reactions after the laser and cravings and to smoke only if the symptoms became unbearable. The degree of craving is assumed to be proportionate to the number of cigarettes smoked. In all cases the withdrawal symptoms matched their previous attempts to give up smoking.

Conclusions

1. Despite the very high initial placebo response in the initial 4 days there is clearly a positive effect on smoking reduction using laser acupuncture in the first 2 weeks of stopping.

Follow up at 3 months was not carried out so it is not clear if this was sustained. Due to the lack of counselling and the continuance of the participants to smoke some cigarettes it is likely the groups would have equalised.

2. There is no difference in reduction using the higher dosage of 48J/cm^2 and in fact the reported reactions indicate that this is too high. As with phototherapy in general there is a saturation effect using laser for acupoint stimulation as has been reported by several authors [6,7]. This lies at or below the dosages used in the 24J/cm^2 group (3J)

What has not been ascertained is whether the more negative effects were experienced as a result of dose per point (48J/cm^2/3J) or total dosage (72J).

3. The results with laser acupuncture appeared to be similar to our past experience with electro acupuncture using needles. The laser does, however, have several advantages. There is no possible problem with septic reaction to the needle and it is more readily accepted by the patient. It requires less training and the time taken for the treatment is reduced. A more detailed comparison of laser and electro acupuncture would be needed to examine the comparison, but already on the above advantages, the laser is replacing the needle for smoking cessation in the clinic.

4. As with all methods which rely on endorphin production to reduce nicotine craving, laser acupuncture should be seen within the context of a wider programme to address the psychological and dietary issues which exist in all addictions. From this study, laser acupuncture was able to reduce the craving significantly compared to the placebo within the critical 2 week period when physical endorphin levels are depressed as a result of stopping the nicotine. Long term follow up was not recorded as this is more related to lifestyle changes than nicotine withdrawal reactions and hence beyond the scope of this study.

SMOKING CESSATION

Auricular & Peripheral Points