



LOW LEVEL LASER THERAPY IN BACK PAIN PATIENTS

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ABSTRACT Application of low level laser therapy in the treatment of back pain is gaining acceptance in the fields of physiotherapy. Low level lasers produce less heat and create a bio-stimulatory effect which repairs damaged cells. The aim of this paper is to investigate the effect of cold laser therapy along different energy quanta in lower regions of the back. A randomised double-blind controlled trial was conducted to evaluate the effects. 3D NLS system of scanning was used to trace and grade the energy and physiological changes along the spine. A total of three patients were subjected for the laser therapy for six weeks. The results suggest a short term effect on the application of low level laser on low back pain. More research needs to be done to show how effective low level therapy is in the long-term.

KEYWORDS :**Introduction**

The term Laser is an abbreviation for Light Amplification by Stimulated Emissions of Radiation. Low level laser stands for low energy Lasers (Tuner and Hode 2007). They are low energy laser used for healing and not for surgical purposes. These lasers are called cold because they do not produce heat and consequently do not damage cells. Lower back pain is a common musculoskeletal symptom that may be acute or chronic. Nice guideline had defined lower back pain as a pain lasting for up to six weeks (Savigny P, 2009).

In the UK, a survey conducted in the year 2000 reported that 49% of the adult population suffered from lower back pain at some point (Palmer K.T et al., 2000). In 2012, national pain audit reported that many pain sufferers end up depressed at some point (Price C et al, 2012).

Majority of back pains are most commonly treated through use of physiotherapies, and with high costs in terms of surgical procedures. The use of techniques ranging from acupuncture to tens machines, that utilises certain micro currents that depolarises cells, resulting in a reduced pain. They have failed in promoting cell growth and repair and that is why low level laser will seem to dominate the scientific world in no time.

With increasing trials of cold laser in pain management practices, the failed results from various studies have questioned the efficacy of cold lasers and their place in pain management. With such conflicting results, a validated report will justify the outcome through a rapid well documented process and scientifically proven outcome.

This research is based on using the latest technology in low level laser in alleviating lower back pain by utilising a Russian scanning technique NLS System that measures certain energy levels and applying laser at specific points to reduce the pain. Such a technique is far superior and has its advantages.

Aim of the study

The purpose of study was to investigate the effects of Cold laser therapy on Lower back pain using 11 subjects with lower back pain and employing Omega Laser and Gallium aluminium Arsenide lasers known as GaAlAs..

Methodology

Both male and female with chronic low back pain had been recruited for this research in two phases through pharmacy and rehabilitation clinic. Patients were given questionnaires to fill out. The returned forms were assessed and patients were then selected based on the inclusion criteria. The patients all signed a consent form and also the clinics examination forms. Three patients with episode of non specific low back pain that had persisted for more than 4 weeks were enrolled into the trail provided they had signed the written consent forms.

The study criteria included:

Aged between 20 and 65 years, Written informed consent, Psychologically sound, Low back pain that was greater than 4 weeks

The exclusion criteria included

Specific low back pain with less than four weeks of diagnosis, Patients with depressive episodes and psychological diagnosis, Previous participation to back pain research, Painful chronic illness, Pregnant patients, Epileptic patients, Patients with history of cancer

To get reliable results, the need to use reliable equipments is of significance. But one must ensure that absolute care for the safety of the patients.

In this research, we used the 3D NLS Bioresonance scanner to trace the stress states of the cells. This in turn would help to analyse if the cells had been returned to a less stressed state. The assumptions are: where there is pain, there is stress, and if the stress levels can be reduced then LLLT can be validated as a modality in the pain management. The effects of LLLT in biological terms can be measured as a histological evaluation (Salate et al., 2005).

3D Non-linear diagnostics is based on a new physics of quantum-entropic interaction. This ensures that maximum information of a patient can be obtained from gravity, maturity and intensity of the functional changes in human organism. This machine was first invented by the academician Svyatoslav Pavlovich Nesterov in 1992-1999. The working frequency generators (1.4-4.9GHz) allows us to examine the internal organs with up to 30 micron resolution. This scanner works by sending infra-red signal of extremely low intensity to the bio-field around the brain through headphones. The working principle is based on the quantum entropy logic theory, which is explained in two postulates. Information is a material category and obeys the law of conservation of energy. A stress cell would always strive to return back to a normal state. Frequency patterns are used to describe the state of a cell. The frequency pattern is more stable when the cells are normal and becomes less stable when the cells becomes stressed.

It compares the measurements received to a database of thousand frequency of reference diagnosis and conditions. It then mapped out the area of instability. The organs are then picked up by the headphones with inbuilt resonant detectors. This information is immediately compared with thousands of stored patterns in the database. The results are then superimposed onto an anatomical image of the area being scanned. The energetic condition is first evaluated.

Comparative studies have shown that 3D NLS bioresonance scanners are equally as effective as Nuclear magnetic resonance systems. With high resolutions of the NLS equipment, it can now reveal morphological damages and also provide information about degree of changes in degenerative discs (Nesterov VI., 2013).

Omega laser system is used in this research for the treatment of low back pain. It is a class 3B commercial laser, operated with various pulsing frequencies.

The omega laser system come with two probes, the single probe comes with 830nm (200mW) wavelength, while the cluster probe is the

mixture of 660nm, 950nm, 940nm,890nm,830nm and 875nm wavelength with a total power of 990mW. This laser system is made of Gallium Aluminium Arsenide Lasers. Application of light energy to the surface of skin results in loss of some energy. Depth of penetration is defined as the depth at which 60 percent of the light is absorbed by the tissue, while 40 percent of the light will continue to be absorbed in way less fully understood.

The 830nm wavelength probe is used to treat conditions that required lots of energy like a broken bone or a deep seated wound. The depth of light penetration is 3-4mm. The 630nm probe is used for superficial problems as the depth of light penetration is roughly 1-2mm (Kolari and Airaksinen, 1988). The laser light used in this study is a pulsed light. Pulse light offers numerous advantages over continuous mode. Because of pulse on times, less energy is dissipated and more energy is delivered to deeper tissues that need them (Javad Hashmi et al.,2010).

The cluster probe is used to treat everything especially wounds due to large area of irradiation. It is used after the single probe to ensure that larger areas are irradiated. The cluster probe is used to soften tissues around pain and injury.

Three Patients were used in this study. In this study patients will need to be there 30 minutes before irradiation as the NLS system will need to scan Patients before Treatment. Patients are asked not to eat or drink Caffeine based products and must be in a calm and well relaxed manner before the Scans. All instruments must be set prior to start and the environment must be conducive to the patients.

Results

The 3D NLS scanning system were used before the first treatment and 6 weeks later. The interpretation were based on the works of Nestervov (2013).

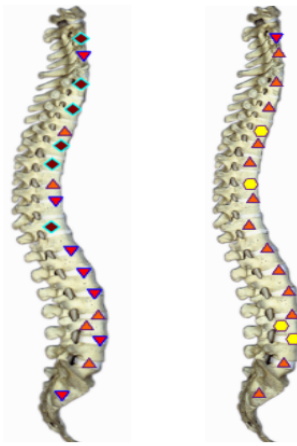


Figure. 3 comparative analysis of the right spinal column for patient C after 6 weeks of Laser therapy.

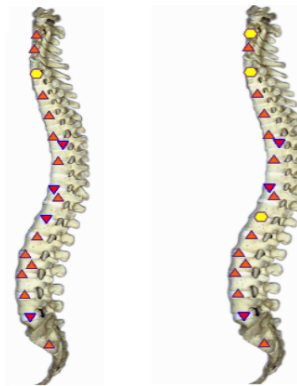


Figure.4 comparative analysis of the left spinal column for patient C after 6 weeks of Laser therapy.

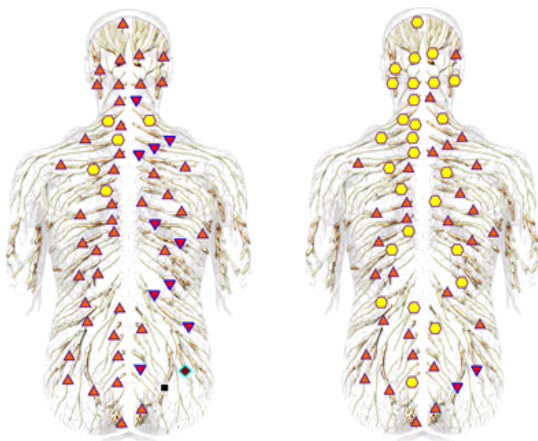


Figure. 1 Comparative analysis of the back spinal nerves of patient C after 6 weeks of Laser therapy.

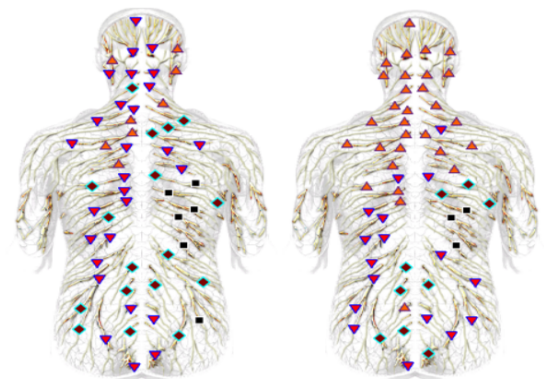


Figure. 5 comparative analysis of the back for patient F after 6 weeks of Laser therapy.

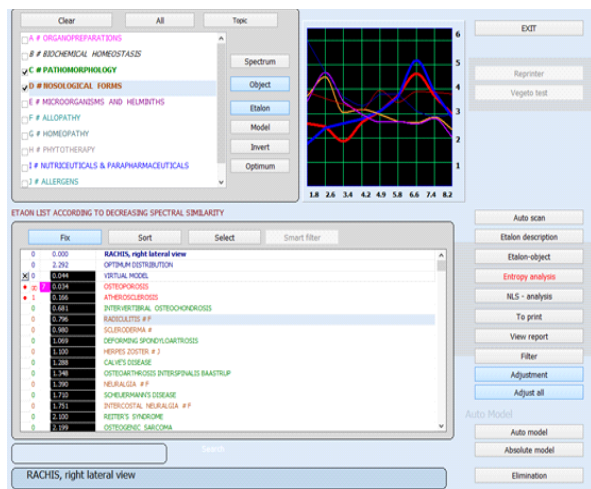


Figure 2 entropy analysis confirms the patient has osteoporosis.

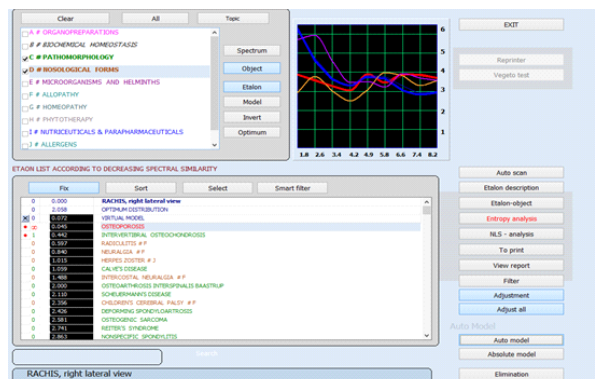


Figure. 6 entropy analysis for patient F confirms osteoporosis

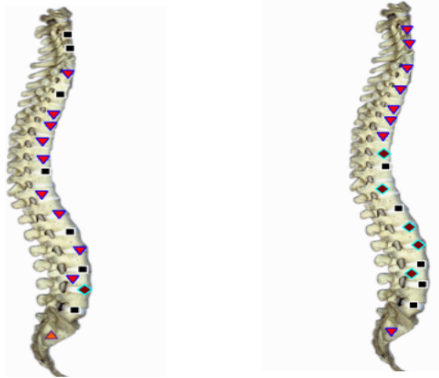


Figure. 7 comparative analysis of the right spinal column for patient F after 6 weeks of Laser therapy.



Figure. 11 comparative analysis of the right spinal column for patient I after 6 weeks of Laser.



Figure. 8 comparative analysis of the left spinal column for patient F after 6 weeks of Laser therapy.

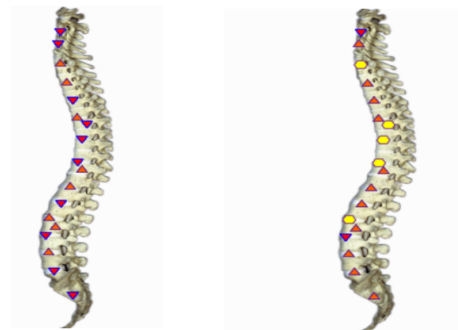


Figure. 12 comparative analysis of the left spinal column for patient I after 6 weeks of Laser therapy.

	Level of functional activity weak or latent.		Minimum alteration of regulator systems.		Low compensation of adaptation mechanisms.
	Optimal level of regulation.		Irritation, tension status of regulator systems.		Decompensation of adaptation mechanisms, evident pathological statuses.

Figure 13. Shows the degree of stress in cells from a weak cell activity to a pathological status.

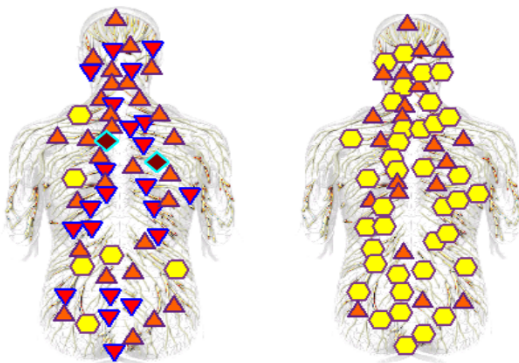


Figure. 9 comparative analysis of the back spinal nerves of patient I after 6 weeks of Laser therapy.

Discussion of Results

Low level laser therapy is emerging as one of the leading modalities in treating patients with back pain. It has really gained a lot of interest in the last couple of years with so many cited publications.

The result of my case study (Fig. 1) suggested in patient C an energy change from a level 4 to level 2 after 6 weeks of laser therapy suggesting that the back nerve cells have been energised. The percentage change in back pain scored 35% improvement. Entropy analysis (Fig. 2) using the bioplasm 3D NLS scanner suggested that the patients was suffering from osteoporosis and atherosclerosis with a spectral analysis score of 0.034 and 0.166 respectively. This suggests the values are significant the spectral analysis scores are less than 0.425. A reduced blood flow to the spinal nerves and weakened bones confirms the pain symptoms of this patient. A close look at figure 3 suggests the change in entropy values as the right spinal column was lasered after 6 weeks. This showed a 66% improvement in nerves of the back. The left spinal column for patient C showed a 12% improvement after 6 weeks of laser therapy.

Lets have a look at the back nerves for patients F after 6 weeks of laser therapy. Entropy analysis suggested the patient has osteoporosis with a spectral value of 0.045 which confirms the diagnosis. A close look at the entropy table suggested intervertebral osteochondrosis which is not significant but had presented as a new development along the spine. Comparative analysis of the right spinal column (Fig. 7) for patient F suggested a 1% improvement , while the left spinal column (Fig.8) suggested a 2% worsening in spinal column.

Figure 5 shows the comparative analysis of the back nerves for patient F after 6 weeks of laser therapy; 32% improvement was seen. We can deduce from here that laser therapy seems to be more effective in soft tissues as compared to bone structures in the body.

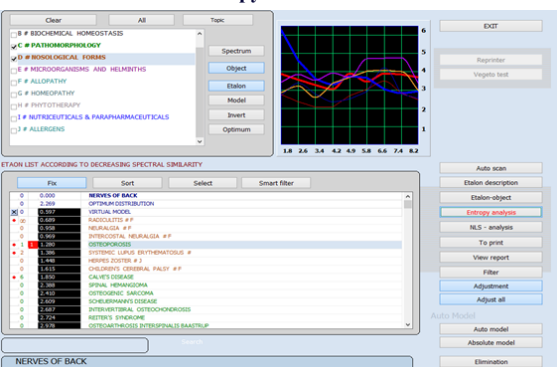


Figure. 10 entropy analysis of the back spinal nerves for patient I.

Entropy analysis of the right spinal column for (Fig. 11) suggested a 28% increase in strengthening reactions. The left spinal column (Fig. 12) suggested a 46% increase. A close look at the back nerves at figure 9 suggested a 65% increase in strengthening mechanisms ; a clear indication from a stage 4 (red) to a stage 2 (yellow) (fig 13).

A reduction of the inflammatory process denotes the changes in the phases as seen in figure 9. The entropy value in figure 10 suggests that radiculitis could be in the near future if this inflammatory process is not corrected.

Conclusion

In this study there is clear evidence that laser therapy is effective in the short term in back pain patients. But we have to be clear in terms of its effects on the intervertebral discs. We note that laser therapy has limited effects on the bones and more studies needs to be done in this area.

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