

Low Level Laser Therapy and Chronic Obstructive Pulmonary Disease

Richard Evan Steele

Kliinikken Livet, Silkeborg, Denmark

Email address:

steele@dadlnet.dk

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Abstract: A novel treatment modality for the treatment of COPD is presented. A patient story in which a patient was brought from a pulmonary capacity of 25% to a pulmonary capacity of 44% over a series of 13 treatments is presented. The patient in question had a concomitant improvement in quality of life that is hitherto unheard of in this patient category. This study was neither planned nor theorized. On the contrary, it came about due to a patient query that caught me by surprise. Where she was before the treatment unable to carry out many activities of daily living without assistance, she was after the treatment able to carry out nearly all her activities of daily living without assistance. A case for the dissemination of this effective treatment is made. Low level laser therapy definitely has its place in the treatment of any inflammatory process for which reason it is clearly relevant in the COPD sphere. Experience of the author in related fields is shortly presented as well as the political and financial aspects discussed. There is no doubt that low level laser therapy will enjoy much further dissemination in the years to come, and this article is a step in that direction.

Keywords: Chronic Obstructive Pulmonary Disease, Low Level Laser Therapy, Cost of Disease

1. Introduction

Every experienced clinician has met many patients with chronic obstructive pulmonary disease (COPD) in various clinical settings [1]. The prognosis is generally poor, going from bad to worse and ending in death [2]. Death in a COPD state is not a best case scenario, because the patient with COPD is generally plagued by angst stemming from the fact that anyone lacking oxygen becomes afraid [3]. This well-known fact as a factor leads to a low dose Benzodiazepines being prescribed to ameliorate the angst condition [4]. The story described below is of a different nature, one that flies in the face of common knowledge and elucidates a methodology which can alleviate the burden for many COPD patients, while at the same time saving health care systems for billions in outlays that could otherwise be spared.

Chronic obstructive pulmonary disease (COPD) is a widespread killer of, especially, older smokers of tobacco and/or previous heavy users. The economic burden of COPD in Denmark was estimated to be about EUR 1.13 billion in 2010 [5]. The authors of this article utilized good methodology to ascertain many various costs not readily

visible for all, including loss of workdays, next of kin loss of workdays, transport to and from hospital etc. Obviously, any method to reduce this burden would be beneficial.

A 73-year-old woman had booked a time in my clinic due to back pain. The pain was diffuse lumbar pain with no neurological complications. On her first visit, the patient needed three pauses going from the ground floor to the level above, where the clinic is located, and had a slightly wheezing inhalation and a heavily wheezing exhalation which continued throughout the treatment which lasted an hour. The patient asked me if I thought that low level laser therapy (LLLT) could be beneficial for her COPD. The patient's pulmonary capacity had been measured some days before her visit to 25%. I told her that I did not know, but I knew that a significant part of the COPD condition is inflammatory [6], and I thought it worth a try.

2. Methods

The patient was treated sitting on the edge of the gurney, as she could not lie down flat, and the gurney does not have a raisable top half. The treatment consisted of adjacent pulses

of low level laser therapy consisting of five diodes emitting 200 mW each for a total of 1 W. All of both lung areas were treated thus which makes the treatment a time-consuming process. The diagnosis and the workup require medical knowledge and experience, but the actual application of the laser light could be administered by just about anyone given medical supervision.

The laser element of the diode emits laser light with a wavelength of 810 nm as well as a visible red light of 660 nm. The unit runs on standard wall outlet power, and is compatible with both US and European voltages and frequencies. It has been established that the laser light emitted by Thor Photobiomodulation's LX2/2 laser apparatus penetrates tissue to at least 6 cm, although this was established in necrotic brain tissue [7]. It stands to reason that the penetration is greater the less dense the tissue is.

3. Results

LLLT has been shown to improve walking distance in a cohort of Egyptian COPD patients [8]. The Egyptians did not use spirometry, perhaps they did not have the apparatus. At any rate, the results were impressive.

After 5 sessions, my patient was able to go up the stairs without pauses, and after 13 sessions, her pulmonary capacity was measured to 44%. Her quality of life had improved considerably and she was able to carry out many functions she had prior to my treatment considered undoable. This included participating in garden activities, doing her toiletries without assistance, enjoying eating instead of it being a chore and many other small things that those of us without serious COPD consider naturally doable. This level of improvement in quality of life has never before, to my knowledge, been published in the field of chronic obstructive pulmonary disease. The patient was quite obese and had large breasts, which of course reduces the amount of light reaching the inflamed tissue. It stands to reason that slimmer individuals would benefit more from the treatment. The patient chose to discontinue the treatment after 13 sessions, so I do not know whether further treatment would have bettered her condition even more. LLLT has been shown to be an effective anti-inflammatory treatment [9].

4. Discussion

A Hungarian surgeon called Edre Mester is generally credited as being the first to use light therapy in the clinical setting. Using a mouse model, he attempted to show an effect on induced skin tumors using a Ruby laser, as his theory was that a significant proportion of the skin tumors was of an inflammatory nature. He did not detect any effect on the skin tumors, but noted a significant difference in the rate of hair growth which was higher in the treated group than it was in the nontreated group [10]. The universality of the treatment modality is hampered by various factors, the most important of which is that treating with LLLT always reduces the amount of medicine a patient need take which of course is

deleterious to the financial concerns of pharmaceutical companies. These companies have huge resources and reach as well as political clout, and this would likely lead to backroom discussions between pharmaceutical company executives and politicians about keeping LLLT on the sidelines [11]. A second factor is a lack of knowledge among clinicians in the field. My own example will elucidate this. I ran a clinic treating chronic pain patients from 2005 to 2011. The clinic was mobile, i.e. we visited the patient instead of the patient being forced to come to our clinic. The clinic had a success rate measured in terms of getting the patient back to the workforce as the dependent variable of 63% [12]. This was in a group that had at least one and up to three different specialist opinions that had defined the patient as being beyond therapeutic reach. The clinic used myself as the attending physician, psychologists and an excellent group of relaxation therapists that utilize various methods among these cranio-sacral therapy. An example will illustrate the power of this intersectoral approach. Hassan had lived in Denmark for 10 years when he was referred to my clinic by the county authority. He had not learned Danish during that time, so the workup and treatment had to be translated by an interpreter. Curiously, it was quite difficult to get Hassan to explain what his physical problems were, because when asked what bothered him, he started by listing all of the various torture sessions he had been through. I explained to him that we cannot make this go away, but we could treat his symptoms and asked him what they were. He spoke of headaches and neck and back pains and pains in both shoulders. I asked my relaxation therapist to give him a treatment on the mobile gurney that we had along, and we removed ourselves from the room and had a talk with the wife and a son in the kitchen. After about 20 minutes, the relaxation therapist came out of the room and said that Hassan was sleeping. He appeared in the doorway a good hour later with a big smile on his face. The wife was flabbergasted, first because Hassan had a smile on his face, which was very rare, and that he slept for a full hour which he had not done since she had known him, sleeping only 10 minutes or so at a time. This of course was not the end of Hassan's problems, but it shows the power of addressing the symptoms rather than the story. This is typically what psychiatrists do in a procedure called incident debriefing [13] a procedure that retraumatizes the patient and has since been shown to do more harm than good (ibid).

The article (A novel and effective treatment modality for medically unexplained pain) led to me being recruited as the keynote speaker at the 2010 international conference on chronic pain in Jerusalem. This again led to me being recruited as the keynote speaker at the 2011 international conference on chronic pain in London. My lecture was followed by James Carroll, the CEO of Thor Photobiomodulation who spoke of LLLT and its many uses in chronic pain. I was taken completely by surprise, as I had never heard about LLLT before then, and I am certain that if I had known about it while I had the clinic described above that my success rate would have been closer to 100% rather than 63%. I seriously doubt that if I had not been to this

conference, that I would never have heard about LLLT. And when a specialist in the field has not heard of it, how can one expect others to gain such knowledge? At the recent PBM 2021, nearly all of the participants were LLLT practitioners, and the impact of such a conference is not very well disseminated in the broader clinical community. This in spite of the fact that we the practitioners generally do what we can to disseminate the knowledge that we have. Meanwhile, because of the issues named above we are fighting in uphill battle.

5. Conclusion

This study clearly shows that LLLT is an effective tool for ameliorating the symptoms of COPD, and casts a ball in the air waiting to be grabbed by the open-minded professional who is willing to entertain the prospect that this novel treatment modality has the potential to save thousands of patients from their low quality of life and give them back pulmonary capacity allowing them to do activities which they have been shut out from due to COPD. The treatment is time consuming and therefore difficult to sell. The treatment modality has the potential to save healthcare systems billions in direct and indirect costs, which should get payers to take notice.

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