Low Level Laser Therapy in Seronegative Spondylo Arthropathic Back Pain- Case Report

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Abstract: The seronegative spondyloarthopathies comprise a group of related inflammatory arthritis, which are classified together because they primarily affect the ligaments and share many clinical, epidemiologic and imaging features. Inflammatory back pain history, early morning stiffness (back, buttock) > 30 minutes. Improves with exercise, worsens with rest. If pain wakes patient up at night it is usually in the second half of the night. Associated with increased ESR/CRP. Insidious onset before age 40. Persistence for at least 3 months.

Several therapies have been advocated to manage these disorders such as trial of NSAIDS, TNF blockers, SSZ, MTX. Physiotherapy adjuncts such as exercises and electro modalities like IFT, TENS,US could do prevent the symptoms but not to the cause, hence laser which prioritize anti-inflammatory effect and pain relief is assumed to control pain related disabilities and promote anti-inflammatory effects with no side effects.

In this paper one subject with spondyloarthropathic back pain was treated using 905nm low level laser for anti-inflammatory effect and pain relief and thereby reducing the disability related with pain.

BACKGROUND

Inflammation in the spine may affect the ligaments, intervertebral disc, and synovial joints and result in osteitis of adjacent bone. The inflammation may subsequently cause mineralization and osification of the ligaments and destruction of the joints, which in some conditions may also result in fusion. The seronegative spondyloarthopathies comprise a group of related inflammatory arthritis, which are classified together because they primarily affect the ligaments and share many clinical, epidemiologic and imaging features. The principal clinical entities of this group include ankylosing spondylitis (AS), psoriatic arthritis (PA), reactive arthritis, enteropathic spondylitis (ES) and undifferentiated spondyloarthropathy.1,2

A heterogenous group of immune-mediated inflammatory diseases 1A, Can be divided into two subgroups according to the predominant symptoms. Axial SpA (spine), Peripheral SpA (peripheral joints), SpA can result in abnormal bone formation with eventual ankylosis of the spine, resulting in substantial disability. Diseases belonging to this group share clinical and genetic characteristics, which distinguish them from rheumatoid arthritis. The etiology of the inflammatory spondyloarthopathies is unknown. There is a hereditary component that varies in importance between the different conditions comprising this group. HLA-B27 is present in 90% of patients suffering from AS, in 50% of patients with RA and in only 20% of patients with psoriasis. The human immunodeficiency virus (HIV) may be an underlying predisposing factor for PA. Reactive arthritis (Reiter's disease) occurs after infection with specific organisms associated with diarrheal illness or urogenital infection.2,3

The majority of individuals with symptomatic disease is either HLA-B27 positive or is infected with HIV. Inflammatory back pain history, early morning stiffness (back, buttock) > 30 minutes. Improves with exercise, worsens with rest. If pain wakes patient up at night it is usually in the second half of the night. Associated with increased ESR/CRP. Insidious onset before age 40. Persistence for at least 3 months.3,4

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CASE PRESENTATION

Low level laser therapy was given to a subject with seronegative spondylo arthropathy inflammatory back pain who was treated on outpatient basis in the department of physiotherapy. An informed consent was obtained before starting the therapy and ethical clearance was obtained. Subject and
therapist were made to wear protective goggles to prevent any inadvertent effect of laser therapy. A 37-year-old lady presented with inflammatory back pain past 7 years with exacerbation from 3 years. Along with complaints of bilateral SI joint pain. History of familial inheritance and multiple joint involvements were present. Clinical examination revealed of inflammatory back pain, more at early mornings and involvement of SI joint was confirmed. Tenderness over SI joint, FABER +ve, chest expansion normal, Schober 10-12cm, OWDQ70%, NPR 8, loss of lumbar lordosis and no neurologic deficit.

INVESTIGATIONS
Elevated ESR and CRP, decreased level of Vit D. MRI and Xray of Spine suggesting inflammatory spondylo arthropathic changes.

TREATMENT
A low level laser therapy was used, visible red 905 nm class 3B laser product. Frequency of 10,000HZ, pulsed, with duration of 3 min on each tender point of density 3 J/cm$^2$. Total duration of 5 days, 2 sessions per day. The subject had no discomfort during the laser session. Medications except vit D supplements were with held during therapy. Subject were asked to perform general conditioning exercises for lower back.

OUTCOME AND FOLLOW-UP
Numeric pain rating and Oswestry low back pain questionnaire were obtained before and after the therapy and a follow-up after two months for a period of six months duration was obtained. No or minimal recurrence of pain was noticed throughout the follow-up period.

<table>
<thead>
<tr>
<th>Period</th>
<th>NPR (pre)</th>
<th>NPR (post)</th>
<th>OWQ (pre)</th>
<th>OWQ (post)</th>
</tr>
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<tbody>
<tr>
<td>Day 1-5</td>
<td>9</td>
<td>2</td>
<td>42</td>
<td>10</td>
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DISCUSSION
The subject with inflammatory back pain reported severe pain and disability. The conventional strategy is to reduce pain and minimize disability; however, none of the previous treatments used to date were effective.

The mechanism by which laser therapy can reduce pain is not fully understood. Some of the explanations for the analgesic effect of laser therapy are as follows: blockage of action potential generation and conduction of nociceptive signals in primary affected neuron, increase in amount of natural analgesic such as opioid peptides, decrease in the release of chemical substances such as histamine and blockage of acetyl choline, reduction in synthesis of bradykinin and prostaglandin $E_2$, improvement in local microcirculation and enhance oxidation to hypoxic cells and mediation of synaptic gate transfer substance. Laser enhances anti-inflammatory effects$^{11}$.

CONCLUSION
Low level laser therapy is effective in preventing inflammatory reactions, pain and thereby increasing functional independence. Laser arrest the progress of inflammation and blocks the pain. Laser can be used as an adjunct for anti-inflammatory effects and can reduce the dosage of
NSAIDS. Extensive studies are required to be performed for the confirmation.

**Competing interests** None.

**Patient Consent** Obtained.

**Provenance and peer review:** Internal review.

**REFERENCES**

1. Lechyd B, Board H et al; Recognizing inflammatory back pain, Pfizer, December 2011.