USING RYODORAKU AND VISUAL ANALOGUE SCALE TO EVALUATE THE EFFECT OF THE LOW LEVEL LASER ON LOW BACK PAIN

Abstract

Laser acupuncture has the characteristics of non-invasive, non-infectious, and easy to use, and it can avoid the pain and psychological fear of traditional acupuncture. Thus, we choose laser acupuncture to execute this trial which with many clinical and scientific experiments shows that there are effective. And use Ryodoraku to measure the change of the values.

Laser which wavelength is 808nm and the pulse rate is 20Hz, is used to irradiate Weizhong (BL40) and Ashi acupoint for 10 minutes, and the Ryodoraku value was measured 2 times, i.e. before and 15 minutes after laser irradiation. Sham irradiate is served as active group.

The results shows that laser irradiation of Weizhong and Ashi might increase Ryodoraku value (Bladder Meridian, Foot-Taiyang) even after latent time, and the increase is statistically significant.

Keywords: Laser acupuncture, Ryodoraku, Ashi, Weizhong, Bladder Meridian

Reason and Purpose

Most people often overlook the severity and the impact of low back pain (LBP). However, the influence of low back pain is very wide, especially in the quality of life. The impact of low back pain will lead to spinal instability over time. It will produce more uncomfortable status, and lead to chronic low back pain finally [1].

Acupuncture is the oldest and also an important therapy of Traditional Chinese Medicine. By stimulating the acupoint as an effective treatment of pain [2]. Moreover, various studies have shown that acupuncture has efficacy for the treatment of long-term disease [3, 4]. But acupuncture needs not only technique, but also understanding the flow of qi of human body and the theory of 12 meridians. For those people who are afraid of needles, they do not willing to endure the tingling of acupuncture. Westerners are also doubts on acupuncture may result in tissue damage and infection.

Low level laser can cause the adjustment of physiological function. For example, it has anti-inflammatory analgesic efficacy of tissue, and increase blood circulation or enhance the metabolism of human body [5]. Some researchers try to replace the needles by using laser. Therefore, it was called "Laser acupuncture". It has the advantages of painless, non-infection, without fear, easy to learn, and the dosage can be controlled as the acupuncture on acupuncture points if use the low level laser [6]. And the applicability of some diseases of laser acupuncture is much better than traditional acupuncture. For instance, back pain, hypertension, osteoarthritis, and so on [7, 8, 9]. The depth of penetration of laser varies with wavelength, just like acupuncture. There is another therapy called cupping, it can dispelling the cold and clear the role of blood, and it has good efficacy of relief on neck and back pain[10]. After the acupuncture, cupping conducted in the painful area can facilitate the flow of qui in meridians.

After laser biostimulation was published by a Hungarian professor, Mesker, in 1969, low level laser therapy (LLLT) was popular from Eastern Europe to the whole world. And the Related Research Institute established inland continued [11]. Laser Acupuncture is widely used for treatment of acute or chronic pain around the world, such as chronic myofascial pain [12]. Many scholars also use NdYAG laser, semiconductor GaAs laser acupuncture to treatment dorsal muscle pain and lower back pain [13, 14]. In 2002, Albrecht F.Molsberger's research result shows that acupuncture (fixed points) plus conventional orthopedic therapy is much better than placebo (non-fixed points) plus conventional orthopedic therapy (p<0.02, statistically significant) [15]. Sadia Ahsin also published electro-acupuncture can ease the pain, improve stiffness and movement [16].

At present, there is sufficient evidence to prove the value of acupuncture, and encourage to further study relationship between the physiological and clinical [17]. Another study showed that
acupuncture is a safe and supporting the traditional treatment [18]. Besides, the laser acupuncture is an alternative. According to Arndt-Schulz Biological Law, the high doses exposure of laser light can lead to tissue cells have a strong hysteresis phenomena, while the low-intensity stimulus were on the favorable [19]. Efficacy study of traditional acupuncture, the treatment of lower back pain with acupuncture was better than placebo [4]. But the laser acupuncture plus cupping on the efficacy of back pain is not been published yet. Thus, this study use low level laser acupuncture stimulates the patient's acupuncture points, using Ryodoraku and visual analogue scale to evaluate the improvement of the symptoms of chronic low back pain.

We can follow the analysis of low back pain for overall assessment of this study. With sufficient data and select the appropriate points for patients self-examination to understand the impact low level laser acupuncture for chronic low back pain.

Materials & Methods

A. The Object of Study

All patients diagnosed by a doctor for 60 volunteers suffering from low back pain. If combine with other complications, including pregnancy or past medical history, we will exclude from this study, and randomly assigned to laser group and placebo group.

B. Experimental Procedure

All patients are in the room with air-conditioned (25℃) and quiet as follows Figure 1.

1. Every patients will receive one treatment (five continuous days).
2. This is a single random simple trail, and the patients will be randomly divided into active group and placebo group.
   a. The patients are randomly divided into active group and placebo group.
   b. We record the visual analogue scale, and measure the Ryodoraku value for all patients before the trial.
   c. We use multi-channel laser therapy instrument irradiation not only for 10 minutes on Weizhong acupoint on feet but Ashi point on dorsal. The two groups also receive cupping treat at the same time.
   d. After the patients take a break about 15-minute, we record the visual analogue scale and measure the meridian Ryodoraku value again.
   e. After five days, using SPSS statistical analysis mean and standard deviation of VAS scale and Ryodoraku values.

In order to avoid physical activity and generate excitement caused the Ryodoraku value changes, the patients are laying on the bed quietly and silently.

The procedure of the placebo group is same as the active group. However, in order to avoid the influence of psychological when treating the patients of placebo group, we turn the signal of laser on but actually the power of the laser is off.

C. Laser Acupuncture

The instrument which wavelength is 808nm and the pulse rate is 20Hz was used. (United Integrated Services Co., Ltd)

Figure 2 Multi-Channel Laser Therapy System

RYODORAKU

A Ryodoraku measurement device, TORMETER IW-ZEN RYODORAKU MEDICAL ACUPUNCTURE 55, qualified by Japanese Ministry of Health (Ministry of Health permit designation (East to use) the 1557 number) was used in this study.

According to the instruction, when skin conductance is less than 50μA, it represented the disease is deficiency syndrome, when skin conductance is greater than 90μA, it represented the disease is excess syndrome.

D. Statistical Analysis

Use Ryodoraku value to laser irradiation pairs before laser irradiation by SPSS software. P value less than 0.05 defined statistically significant for TTest.

Result and Discussion

<table>
<thead>
<tr>
<th>Age</th>
<th>Weight(Kg)</th>
<th>Height(cm)</th>
<th>BMI</th>
</tr>
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<tbody>
<tr>
<td>62</td>
<td>66.36</td>
<td>159.73</td>
<td>25.97</td>
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<tr>
<td>13</td>
<td>13.98</td>
<td>8.81</td>
<td>4.81</td>
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In this study, 60 patients who have chronic low back pain were recruited in this trail. After collect the data, compare and analysis the value of active group and placebo group, see Table 1. There are 24 patients significantly increase in the Ryodoraku value of bladder meridian in active group, and 6 patients decrease. In placebo group, there are 9 patients significantly increase, and 21 patients
The result reveals that the effect of laser acupuncture works delayed effects and continuous effects, see Table 1. The placebo group has no statistically significant. The VAS of all patients are significantly decreased, see Table 2. And it has statistically significant compare with the value of before and after 15 minutes of laser irradiation (p<0.05), see Table 3.

Table 1 • The change of Ryodoraku value of Bladder Meridian.

<table>
<thead>
<tr>
<th>Days</th>
<th>μA</th>
<th>Trial</th>
<th>Control</th>
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<tbody>
<tr>
<td>1</td>
<td>25</td>
<td>25</td>
<td>25</td>
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<td>2</td>
<td>20</td>
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<td>4</td>
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<td>5</td>
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Table 2 • Statistics and analysis VAS of patients.

<table>
<thead>
<tr>
<th>Days</th>
<th>μA</th>
<th>Trial</th>
<th>Control</th>
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<tbody>
<tr>
<td>1</td>
<td>5</td>
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<td>1</td>
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Table 3

<table>
<thead>
<tr>
<th>P value of 12 meridians</th>
<th>First day V.S. Fifth day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laser</td>
<td>0.024610 *</td>
</tr>
<tr>
<td>Placebo</td>
<td>0.00001142 **</td>
</tr>
</tbody>
</table>

*P value < 0.05
**P value < 0.01, defined statistically significant.

Tina I. Karu and other scholars note the continuing effects of laser irradiation and delayed effects [20]. Nishijo (1997) and other scholars have found that acupuncture would reduce sympathetic nervous activity and that make heart rate slow down [21]. According to TCM theory, cupping on the human body will cause warm and stimulating effect on local skin, and improve local blood circulation. A continuous irradiation for a consecutive time would improve the low back pain and influence the relative meridians. In this trial, different physiques may result in different effects for low back pain.

Conclusion

In this study, we know that the vital energy and blood can be reactivated after supplied by laser pulse 808nm and 20Hz irradiation on Bladder Meridian and Weizhong acupoint of Foot-Taiyang. Because of the complement functions of Traditional Chinese Medicine (TCM), the Ryodoraku value of Bladder Meridian would be increased. Therefore, we speculate that the improvement of laser stimulation at Weizhong acupoint of Bladder Meridian maybe similar with traditional acupuncture. Ryodoraku values had achieved the effectiveness of body energy addition, according to Chinese medicine point of view.

But we still need the second phase to determine the values of research. In the future we will carry out the further tests for the patients who have frozen shoulder disease and osteoarthritis.

Reference

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