

## TREATMENT WITH SHORT WAVE DIATHERMY ON CHRONIC LOW BACK PAIN

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### Summary

*A randomized clinical trial was conducted in the Department of Physical Medicine & Rehabilitation, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh, from April' 2006 to December'2006. A total of 50 patients of chronic low back pain were included in the study. The mean age of the patients were  $44.50 \pm 8.94$  years. They were treated with short wave diathermy (SWD) along with conventional treatment. After treatment the result was compared and student's 't' test was done to see the level of significance. There was significant improvement after treatment ( $P=0.001$ ). From the present study, it may be concluded that treatment with SWD may be helpful for the treatment of chronic low back pain.*

### Introduction

Chronic low back pain is very frequently found in our day to day practice. Low back pain that has been present for at least three months is known as chronic low back pain<sup>1</sup>. Low back pain (LBP) is exceedingly common, experienced at some time by up to 80% of the population<sup>2</sup>. LBP is an uncomfortable sensation in the lumbar and buttock region originating from neurons near or around the spinal canal that are injured or irritated by one or more pathologic processes<sup>3</sup>. Defining LBP is difficult, but it refers to a symptom complex in which pain is localised to the lumbar spine or referred to the leg or foot<sup>4</sup>. LBP affects the area between the lower rib cage and gluteal folds and often radiates into the thighs<sup>5</sup>. Despite its high prevalence, LBP remains poorly understood and inadequately treated. This is due to the heterogeneity of the patients' population, and the lack of a simple

and easy to apply, clinically useful system for characterisation of patients<sup>6</sup>. Lumbar backache is one of the most common causes of chronic disability and in the majority of cases of the backache is associated with some abnormality of the intervertebral discs at the lowest two levels of the spine<sup>7</sup>. Back pain is one of the most prevalent medical disorders in industrialised societies<sup>8</sup>. Lower back pain has been estimated to afflict between 60% and 90% of individuals some times in their life, and is the leading cause of disability in people under the age of 45 years<sup>9</sup>. LBP is the most common medical cause of inability to work in the western countries<sup>10</sup>. Non-specific low back pain of mechanical origin is second only to the common cold as a cause of self-limiting symptoms and disability in the community<sup>11</sup>. Back symptom is the most common disability in patients under the age of 45 years<sup>12</sup>. It was estimated in 1997 that the financial cost of low back pain accounting for medical bills compensation and forfeited productivity, was somewhere between \$38 billion and \$ 50 billion in the United States<sup>3</sup>. Abnormalities in the lumbar spine are common, and degenerative changes virtually be found in all older people<sup>13</sup>.

The treatment and management of LBP is not simple. There are many divergent ways of management of LBP. Chronic LBP is resistant to treatment, and patients are often referred for multidisciplinary treatment. Current multidisciplinary biopsychosocial rehabilitation regards disabling chronic pain as the result of multiple interrelating physical, psychological, and social or occupational factors<sup>14</sup>. Bangladesh is a poor country with huge population and with very limited resources and poor management. So, for various reasons we cannot manage a huge number of disabled patients with low back pain with our present resources and management system. So, the aim of this study is to find out the effects of physiatric Modalities regarding the management of the patients with low back pain and to make the disabled patients into a working ones, so that they can contribute for the prosperity of the persons

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themselves as well for the nation. The incidence of LBP varies from country to country but is uniformly high in industrialised nations<sup>15</sup>. Disability related to back pain has increased exponentially over the past 20 years due, at least in part, to psychological and social factors that influence adaptation to back pain early in the process<sup>16</sup>. In a study in the USA it is found that LBP is the most common single musculoskeletal complaint and a major cause for being out of work, resulting in billions of dollars in lost wages and compensations payment annually<sup>17</sup>.

LBP affects 60%-80% of US adults at some times during their lives, up to 50% have pain within a given year. In 5%-10% of patients with low back pain become chronic<sup>18</sup>. Among chronic conditions, back problems are the most frequent cause of limitation of activity in persons younger than 45 years<sup>19</sup>. In our country, many working time of the people is also lost for chronic LBP. And many of them become disabling for the condition. The present study was done to increase the working time and to reduce disabilities of the people by adding SWD in the treatment regimen.

### Methodology

#### Selection of the patients

The study was conducted in the Department of Physical Medicine & Rehabilitation (PMR), Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka. Patients having LBP were selected from the department of PMR who were referred from various out patient departments of BSMMU and also from general practitioners outside the hospital. On arrival at the department, detailed history was taken and clinical examination and necessary investigations were carried out properly. About 58 patients were selected for the study according to the following clinical criteria-

#### Inclusion criteria

- a) Patients of either sex, age  $\geq 30$  years and  $\leq 70$  years.
- b) Patients with complaints of LBP for more than three months.
- c) LBP due to any chronic cause.
- d) Having no evidence of malignancy.
- e) Having no evidence of infection on the skin over the knee joints.

#### Exclusion criteria

- a) The patients of below the age of 30 years and above 70 years.
- b) Patients having LBP for less than three months.
- c) The patients with traumatic LBP.
- d) The patients having acute LBP
- e) The patients having any complications like cauda equina syndrome, caries spine, malignancy, etc.

#### Details of treatment

##### Short wave diathermy (SWD)

The patients were treated with SWD in the low back region. It was the therapeutic application of high frequency current. The frequencies that are allowed for treatment the human being are 13.66 MHz, 27.33 MHz and 40.98MHz. Wavelength is determined by the following formula :

$$\lambda = C/N$$

Where  $\lambda$  is the wavelength,

N is the frequency of oscillation and

C is the velocity of light.

We used commercially available diathermy machines operated at a frequency of 27.33 MHz and hence the wavelength was 11 meters according to the equation. SWD was applied by Condenser technique. Condenser pads were applied to the back with spacing between skin and electrodes provided by 1 to 2 inch layers of terry cloth. It was applied for 15 minutes three times in a week for six weeks. The patients were given usual treatment to maintain the study ethically sound.

##### Data collection procedure

After the treatment of the patients as per schedule, the patients were followed up weekly for six weeks and the outcome were recorded in the assessment data sheet weekly for six weeks. The pain and tenderness were measured by the Lattinen Score and Visual Analogue Score. The data collected from all the cases were recorded under the specified data sheet.

##### Recording

Before admission into the trial the nature of the study was discussed with the patients and verbal consent of the patients was taken. History, clinical examination and relevant investigations were done. The findings were recorded at first attendance and follow up was done weekly for six weeks and all the findings were recorded.

*Statistical methods*

All the outcome assessment data were analysed by using the computer. The numerical data were analysed statistically by using the SPSS-package program (version-10) for Windows. Student's 't' test was done as required, to see the level of significance. The results were expressed as mean  $\pm$  SD and  $p=0.05$  was considered as the level of significance.

**Results**

A total of 58 patients of chronic LBP were included in the study. But 8 patients were dropped out from the study because they cannot attend for physical therapy and / or can not follow the instructions. So, 50 patients followed the treatment allocated for them properly. The mean age of the patients in study were  $42.22 \pm 8.07$  years. Mean height of the patients was  $158.86 \pm 7.5$  cm and mean weight of the patients was  $62.92 \pm 6.7$  kg. Mean duration of symptoms of the patients was  $37.67 \pm 37.80$  months. Maximum patients gave the history of gradual onset of the pain (97.1 %) and a few gave the history of pain after trauma (2.9 %), pain of most of the patients relieved by rest (46.15%) and lying flat (52%) and aggravated by activity. All of the patients had no morning stiffness in the LB region. Maximum patients had the pain of intermittent in character (63.7 %) but 36.30% patients had the pain of constant in character.

**Table I :** The time-point treatment responses of the patients (n = 50)

Time-point score	Mean $\pm$ SD	p-value	95% CI
Pre-treatment	15.16 $\pm$ 3.01		
Vs W <sup>a</sup> 1	Vs 13.94 $\pm$ 2.63	0	0.62 to 1.82
Pre-treatment	15.16 $\pm$ 3.01		
Vs W2	Vs 11.86 $\pm$ 2.40	0	2.54 to 4.05
Pre-treatment	15.16 $\pm$ 3.01		
Vs W3	Vs 11.02 $\pm$ 2.77	0	3.47 to 4.80
Pre-treatment	15.16 $\pm$ 3.01		
Vs W4	Vs 10.30 $\pm$ 2.56	0	4.16 to 5.55
Pre-treatment	15.16 $\pm$ 3.01		
Vs W5	Vs 9.66 $\pm$ 2.55	0	4.76 to 6.23
Pre-treatment Vs	15.16 $\pm$ 3.01		
Post-treatment	Vs 9.04 $\pm$ 2.49	0	5.38 to 6.85

W<sup>a</sup>= week.

*Outcome of the treatment*

There was significant improvement after treatment. In respect to time point improvement, marked improvement was started to occur after one week

that is pre-treatment summation scores Vs W1 score ( at the end of one week summation score)  $15.16 \pm 3.01$  Vs  $13.94 \pm 2.63$  respectively ( $p=0$ , 95 % CI = 0.62 to 1.82) and the improvement gradually increased day by day. And after the end of treatment there was significance improvement found in our study that the pre-treatment Vs post-treatment summation score was  $15.16 \pm 3.01$  Vs  $9.04 \pm 2.49$  respectively ( $p=0$ , 95 % CI = 5.38 to 6.85, Table No-IV). This indicates that treatments with SWD is helpful for the improvement of the patients with Chronic LBP.

**Discussion**

In the present study a total of 50 patients of Chronic LBP were duly participated in the study, mean age of the patients were  $42.22 \pm 8.07$  years. In a study, it was found that maximum patients were in the age group of 30-39 years<sup>20</sup>. This is to some extent same as the result found in the present series. The outcome of the current study is hopeful regarding improvement. The significant improvement of symptoms began to appear at the end of first week. The trends of improvements were continued throughout the whole period of six weeks of study. At the end of 6th week highly significant improvement of symptoms was found. Rahman M found in their study that 77.42% patients improved after treatment with SWD<sup>20</sup>. This is in favour of our study. Short wave diathermy is helpful to improve pain and function of the patient with knee OA. Jan MH and Lai JS found that SWD is effective in the treatment of OA knee joints regarding decreasing pain and improve function<sup>21</sup>. In an another study in India , Bansil et al. found SWD was effective in the treatment of OA knee joints and they showed that SWD provides a wider coverage of all structures of the knee than the ultrasonic procedure and thus gives a more effective soothing effect<sup>22</sup>. On the other hand Svarcova J et al. found good to excellent improvement of pain in maximum patients after treatment with SWD, Ultrasound and Galvanic current<sup>23</sup>. Rahman S et al. found in their controlled comparison study that microwave diathermy is an effective method for the treatment of Lumber Spondylosis-one of the most important cause of LBP<sup>24</sup>. These all findings support the results of the present series. Actually, physical therapy is used as an adjunct to NSAID therapy for pain management and in the maximum study, there is better tolerability and better improvement is found.

**Limitation of study**

Subjects included for the present study to evaluate effect of SWD had confounding variables of their traditional treatment with other pain relieving pharmacotherapy for the purpose of ethical consideration.

**Conclusion**

From the present study, it may be concluded that treatment with SWD may be benefited if SWD is used as an adjunct to NSAID. Large scale study with control group for specific evaluation of it's effect is recommended.

**Disclosure**

All the authors declared no competing interests.

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