Effects of Short Wave Diathermy (SWD) on the Patients with Chronic Non-Specific Low Back Pain

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Abstract

Background:
Chronic back pain is the second most common reason why patients visit primary care physicians and is the number one cause of disability in men aged 31 to 45. Chronic back pain is often resistant to treatment and patients are referred for multidisciplinary treatment.

Objective:
This randomized controlled trial study was aimed to see the effects of shortwave diathermy on patients with chronic non-specific low back pain.

Methods:
A total of 67 patients with chronic mechanical low back were randomly assigned to receive treatment in the Department of Physical Medical and Rehabilitation, BSMMU, Dhaka, during a period of 6 months from 1st July 2007 to 31st December 2007. The patient was divided into two groups; Group A and Group B. In group A (n = 32) the patients are treated with SWD, exercise therapy, oral NSAIDs, and ADL instructions for low back pain. In group B (n =35) the patients were treated with exercise therapy, oral NSAIDs, and ADL instructions for low back pain. The patients were treated for 6 weeks.

Results:
Of the 67 patients, 30(44.7%) were male and 37(55.3%) were female. The mean age was 41.22 ± 8.06 years in both sexes. 85.1% of patients were from urban areas. Immediate improvement (after 2 weeks) in more patients was reported in group A, i.e. with the shortwave diathermy group. After a complete course of 6 weeks, of treatment 71.87% of patients in group A and 65.7% of patients in group B reported improvement. Though both groups reported improvement better result was observed in group A, i.e. in the shortwave diathermy group.

Conclusion:
The combination of shortwave diathermy and exercise therapy is more effective than only exercise therapy in the management of chronic non-specific low back pain.

Keywords: Chronic non-specific low back pain, Shortwave diathermy.

Introduction:

Low back pain is a substantial health problem. It affects up to 80% of the adult population and accounts for considerable health care and socio-economic costs.[1] Chronic back pain is the second most common reason patients visit primary care physicians and is the number one cause of disability in men aged 31 to 45.[2] For non-specific low back pain symptoms, pathology and radiological appearances are poorly co-related. Pain is non-specific in about 85% of people.[3] The type of low back pain most commonly confronting the physiatrists (specialist in Physical Medicine and Rehabilitation) is of benign mechanical origin.[4] Chronic back pain is resistant to treatment and patients are often referred for multidisciplinary treatment.[5] Physical therapies including various exercise programs, traction, manipulation, massage,

TENS, thermotherapy are employed singly or in combination. In one survey of physiotherapy departments, SWD appeared to be the most popular therapy for non-specific L.B.P.[6] In this study an attempt has been made to see the effects of short wave diathermy in the treatment of chronic non-specific low back pain and their therapeutic outcome.

Methods:

This is a single-blind prospective randomized clinical trial study at the Department of Physical Medicine and Rehabilitation, BSMMU, Dhaka from 1st July 2007 to 31 December 2007 over a period of 06 months. During the study period, about 8475 patients with low back pain attended the outpatient department of Physical Medicine and Rehabilitation, BSMMU. Among them, 111 patients were initially selected and diagnosed as cases of chronic mechanical low back pain. Then they were randomly divided into two groups, group A and group B. 34(37.74%) patients were excluded due to some specific causes (lumbar spondylosis, spondylolysis, spondylolisthesis, sacralization, osteopenia, scoliosis from X-ray and in some high ESR). 77(85.47%) patients were found low back pain of chronic non-specific origin and included in this study and treatment was continued. In this study period among them, 67(74.37%) patients completed the study period and attended regularly. The other 10(11.1%) patients were excluded from the study due to irregular attendance and loss of contract. After the initial evaluation, clinical diagnosis of chronic low back pain and of mechanical type was established in pre-designed structured data collection sheets. Group A was given SWD, exercise therapy, NSAIDs, and ADL instructions and group B was given exercise therapy, NSAIDs, and ADL instructions for low back pain. After the treatment of the patients as scheduled, the patients were followed up weekly for six weeks and the outcome was recorded in the assessment data sheet weekly for six weeks. The pain and tenderness were measured by the Lattinen Score and Visual Analogue Score (VAS). Straight Leg Raising tests were performed in all patients weekly for six weeks. The data collections from all the cases were recorded under the specified datasheet. All results were expressed as mean ± standard deviation and the level of significance by P-value unless otherwise stated. $P < 0.05$ was considered as statistically significant. The nature of the study was described to the patients and verbal and written consent were taken. Ethical permission was taken from the Institutional review board of BSMMU.

Results:

Table-I showed the socio-demographic differences between the two groups. Among the 67 patients taken into the study, 30(44.7%) were male and 37(55.3%) were female. The mean age in group-A was 44.19±8.23 and in the group, B was 38.51±6.95. The majority of the patients were from urban 57(85.1%) and very few patients were from rural areas 10(14.9%).

Table-I: Socio-demographic characteristics of both groups (n=67)

Variable	Group A	Group B	Total
Sex			
Male	13(40.6%)	17(48.5%)	30(44.7%)
Female	19(59.4%)	18(51.5%)	37(55.3%)
Total	32(100.0%)	35(100.0%)	67(100.0%)
Age (Years)			
30-39	14(43.7%)	22(62.8%)	36(53.7%)
40-49	10(31.2%)	10(28.57%)	20(29.9%)
50-59	7(21.8%)	1(2.90%)	8(11.94%)
60-69	1(3.30%)	2(5.71%)	3(4.47%)
Total	32(100.0%)	35(100.0%)	67(100.0%)
Residence			
Urban	27(84.37%)	30(85.71%)	57(85.11%)
Rural	5(15.62%)	5(14.28%)	10(14.9%)
Total	32(100.0%)	35(100.0%)	67(100.0%)

After six weeks of treatment, 14 patients in group A and 8 patients in group B reported becoming painless. Symptomatic improvement was reported in 9 patients in group A and 15 patients in group B. After 6 weeks of treatment 6 patients in group A and 10 patients in group B were unchanged and 3 patients in group A and 2 patients in group B became worse. (Table-II)

Table-II: Number of patients with partial, complete relief of pain after 2, 4, and 6 weeks of treatment (n = 67)

	Treatments (weeks)					
	Group A (n = 32)			Group B (n =35)		
	After 2 weeks	After 4 weeks	After 6 weeks	After 2 weeks	After 4 weeks	After 6 weeks
Recovery No. Percentage (%)	2 (6.25%)	2 (6.25%)	14 (43.75%)	0	2 (5.71%)	8 (22.85%)
Improved No. Percentage (%)	10 (31.25%)	20 (62.50%)	9 (28.12%)	8 (22.85%)	11 (34.37%)	15 (42.85%)
Worse No. Percentage (%)	3 (9.37%)	3 (9.37%)	3 (9.37%)	2 (5.71%)	2 (5.71%)	2 (5.71%)
Unchanged No. Percentage (%)	17 (53.16%)	7 (21.87%)	6 (18.75%)	25 (71.42%)	20 (57.14%)	10 (28.57%)

In all 71.87% patients in group A i.e. with short-wave diathermy group and 65.7% patients in group B reported improvement after 6 weeks treatment (Table-III).

Table-III: Total number of patients reported improvement after 6 weeks treatment (n = 67)

Treatment	Number of patients	Percentage (%)
Group A (n=32)	23	71.87%
Group B (n = 35)	23	65.7%

Therapeutic outcome:

The outcome was dependent mostly on the intensity of pain. In this clinical trial, the pain intensity was the summation of lattinen test (score 20), tenderness index (score 4), and Visual Analogue Scale (score 10). At initial assessment (pretreatment- W0) the summation of pain intensity was considered highest. Then after starting therapy (Group A: SWD, exercises, NSAIDs, and ADL; Group B exercises, NSAIDs and ADL) every week's summation score was compared with the pretreatment summation score for six weeks.

Treatment response in Group-A:

Treatment responses in group A at different follow-up assessments were depicted in the table-IV below. The treatment response at each follow-up was compared with that of pretreatment scores (W–0).

Table-IV: Treatment response in Group A (n=32)

Outcome parameters (w=week)	Group–A Mean (±SD)	95% Confidence Interval of the Difference		p-value
		Lower	Upper	
W- 0 Summation score & W- 1 Score	14.63(±2.379) 13.25(±2.42)	0.820	1.930	0.00
W- 0 Summation score & W- 2 Score	14.63(±2.379) 11.09(±1.74)	2.728	4.335	0.00
W- 0 Summation score & W- 3 Score	14.63(±2.379) 10.53(±2.62)	3.444	4.744	0.00
W- 0 Summation score & W- 4 Score	14.63(±2.379) 9.53(±2.42)	4.359	5.828	0.00
W- 0 Summation score & W- 5 Score	14.63(±2.379) 8.66(±1.87)	5.142	6.795	0.00
W- 0 Summation score & W- 6 Score	14.63(±2.379) 8.41(±2.804)	0.540	5.117	0.00

Significant improvement ($p < 0.05$) in nearly every week's outcome was observed during the whole treatment period up to 6 weeks. This indicates that SWD, exercises, NSAIDs along ADL instructions are effective in the management of chronic nonspecific low back pain (Table-IV).

Treatment response in group-B:

In group B the treatment response at each week's follow-up was compared with that of pretreatment (W-O) score.

Significant improvement ($p < 0.05$) in nearly every week's outcome was observed during the whole treatment period up to 6 weeks. This indicates that exercise for low back pain, NSAIDs, and ADL instructions is effective in the treatment of chronic nonspecific low back pain (Table-V).

Comparative study between group-A and group-B:

The treatment responses of one group at each follow-up were compared with another group (Table-VI).

The difference of treatment improvement was statistically significant ($p<0.05$) from the 4th week up to the 6th week. This means group A patients were benefited more than group B patients (Table-VI).

Table-V: Treatment response in group B (n=35)

Outcome parameters (W=Week)	Group –B Mean(±SD)	95% Confidence Interval of the Difference		p-value
		Lower	Upper	
W-0 Summation score & W- 1 Score	14.86(±3.04) 13.17(±3.02)	1.181	2.191	0.00
W-0 Summation score & W- 2 Score	14.86(±3.04) 11.40(±3.16)	2.872	4.042	0.00
W-0 Summation score & W- 3 Score	14.86(±3.04) 11.34(±3.162)	2.684	4.345	0.00
W-0 Summation score & W- 4 Score	14.86(±3.04) 11.11(±3.08)	2.938	4.548	0.00
W-0 Summation score & W- 5 Score re	14.86(±3.04) 10.74(±3.59)	3.191	5.037	0.00
W-0 Summation score & W- 6 Score	14.86(±3.04) 10.40(±3.58)	3.422	5.492	0.00

Table-VI: Comparative treatment response between group A (n=32) and group B (n=35)

Outcome parameters (W=Week)	Group–A Mean (±SD)	Group-B Mean (±SD)	95% Confidence Interval of the Difference		p-value
			Lower	Upper	
Pre-treatment	14.63(±2.379)	14.86±3.04	-1.573	1.109	0.73
W- 1	13.25(±2.42)	13.17(±3.02)	-1.267	1.424	0.90
W- 2	11.09(±1.74)	11.40(±3.16)	.633	-1.570	0.63
W- 3	10.53(±2.62)	11.34(±3.16)	.714	-2.237	0.26
W- 4	9.53(±2.42)	11.11(±3.08)	.682	-2.945	0.02
W- 5	8.66(±1.87)	10.74(±3.59)	.710	-3.505	0.005
W- 6	8.41(±2.804)	10.40(±3.58)	.791	-3.574	0.01

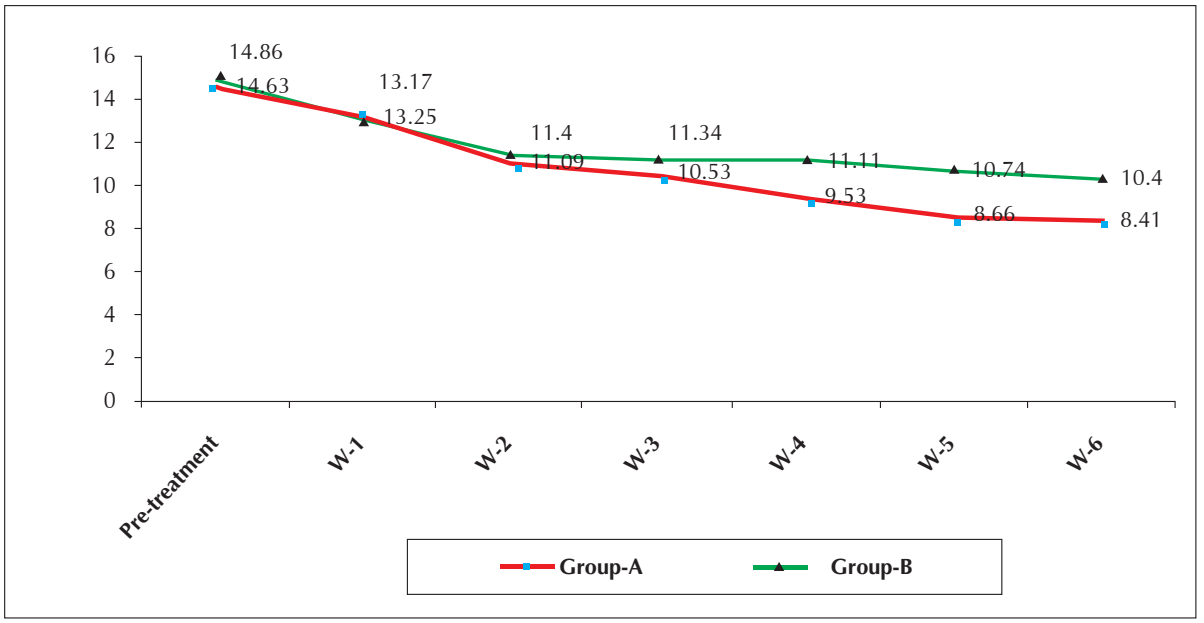


Figure-1: Comparative treatment improvement between group-A and group-B

Both groups reported improvement. But a better improvement was observed in Group A in comparison to Group B from the 4th week to the 6th week (Figure-1).

Discussion:

This randomized controlled trial was held from 1st July 2007 to 31st December 2007 in the outpatient and inpatient Department of Physical Medicine and Rehabilitation, BSMMU, Dhaka. Both men and women are equally affected by non-specific low back pain.[7] Kraus and Nazla[8] studied 12,000 patients where they found 48% patients were male and 52% were female and the male: female ratio was 1:1.08. In the present study, about 45% of patients were male and 55% of patients were female. But the large epidemiological studies found no statistically significant differences between the male and females. The majority of the patients (53%) were in the age group of 30-39 years and the next (30%) were in the age group of 40-49 years. Bendebba M[4] et al. found that the majority of patients with low back pain were in age between 35 and 45 years and the mean age were 44.8 ± 12.74 years. In a study conducted at IPGM&R, Dhaka Moyunuzzaman[7] et al showed that the mean age of the patients with low back pain was 35.47 ± 13.4 years. This study demonstrated partial or complete relief of pain in more patients who received shortwave diathermy than those who did not receive shortwave diathermy. 43.75% of patients in the short wave diathermy group and 22.85 % patients in the other groups reported becoming symptom-free after 6 weeks of treatment. In all 71.87% of patients in the shortwave group and 65.7% of patients in the other group reported improvements in their symptoms. Moyeenuzzaman M[7] et al found 73.33% in the shortwave diathermy group and 64.71% of patients in the exercise group reported improvement in their symptoms after 6 weeks of treatment. Ullan MA[9] et al found 77.77% of patients in the shortwave diathermy group and 78.94% patients in the exercise group showed improvement in their symptoms after 6 weeks of treatment. In current study confirm the superiority of group A (SWD + exercises + NSAIDs + ADL) over the group B (Exercises + NSAIDs + ADL). In this study after 4 weeks of treatment with the SWD group, 62.50% of patients were improved while SinakiM et al[10] found 66.66% improvement among the patients treated with shortwave diathermy. These findings are in agreement with the current study. Ullah MA[9] found 33.33% of patients in the shortwave diathermy group and 15.79% patients in the exercise group were improved after 2 weeks of treatment. Gibson T et al[6] reported a 20% improvement after treatment with shortwave diathermy. Worsening of symptoms occurred in 9.37% of patients who received shortwave diathermy (group A) and in the

other group (group B) 5.71% of patients reported worsening of symptoms.

Conclusion:

Chronic non-specific low back pain (CNSLBP) is a common cause of disability and is a frequent cause of loss of working hours among our people. The combination of shortwave diathermy and exercise therapy is more effective than only exercise therapy in the management of chronic non-specific low back pain. It needs verification by larger long-term follow-up studies.

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