# Use of Electroacupuncture for Treatment of Chronic Sciatic Pain

M Hollisaz

**Citation**

M Hollisaz. *Use of Electroacupuncture for Treatment of Chronic Sciatic Pain*. The Internet Journal of Pain, Symptom Control and Palliative Care. 2006 Volume 5 Number 1.

**Abstract**

Introduction: Chronic sciatic pain is one of the most common complaints of patients referring to orthopaedic, neurosurgery, and physiatric clinics. In most cases, common treatment modalities may be employed. However, in many, the results are not be consistent. Electroacupuncture has been recommended as an appropriate alternative in such cases.

Aim: To assess the effect of electroacupuncture on chronic refractory sciatic pain, we conducted a single-blind clinical trial comparing it to physiotherapy and a placebo.

Material and methods: 119 randomly allocated subjects (59 males, 65 females) were chosen and classified in three treatment groups consisting of: Electroacupuncture (EA), physiotherapy (PT), and a placebo(SO). Pain intensity and related complications were assessed before and after the 5th, 10th and 15th treatment sessions using a visual analog scale.

Results: The pain reduction percentage in the (EA), (PT), and (SO) groups were as follow: 62.1% ± 18.6%, 52.5% ± 17.5%, and 17.5% ± 12.7% ($P<0.05$) respectively. The contentment in the EA group was significantly higher than the other two groups ($P<0.01$). The complication reduction percentage in EA, PT, and SO groups were 89.3%, 51.8%, and 31.9%, respectively ($P<0.05$). EA was more effective than PT in ameliorating buttock pain, lower limb paresthesia, gastrosoleus muscle pain, lateral calf pain, cold feet, increased lordosis and gait disturbance ($P<0.05$).

Conclusion: Electroacupuncture is a semi-invasive and effective method in controlling chronic sciatic pain and complications and may thus be used as a good treatment alternative in indicated cases.

## INTRODUCTION

Prevalence of chronic pains in the society is estimated to be about 7% and increases with age. Chronic sciatic pain constitutes one of the main motives for referral of afflicted patients to physiotherapy, orthopedics, and neurosurgery clinics. Such pains affect life quality and reduce social and economical efficacy. Treatment and control of such pains are costly and unfortunately, in most cases, unsatisfactory. The most prevalent therapy for these pains (excluding analgesic medications), is physiotherapy; notwithstanding its different therapeutic effects, it has no prime effect on decrease and controlling pains in all cases of sciatalgia (Braddon, 1996). A variety of nonsurgical treatment alternatives exists for acute and chronic low back pain. Patients should receive appropriate education about the favorable natural history of low back pain, basic body mechanics, and methods (eg, exercises, activity modification, behavioral modification) that can reduce symptoms. Nonprescription medication is efficacious for mild to moderate pain. Nonsteroidal anti-inflammatory drugs, alone or in combination with muscle relaxants, relieve pain and improve overall symptoms of acute low back pain (Braddon, 1996). Exercise therapy has limited value for acute low back pain, but strong evidence supports exercise therapy in the management of chronic low back pain. Moderately strong evidence supports the use of manipulation in acute back pain. Evidence is weak for the use of epidural corticosteroid injections in patients with acute low back pain, strong for short-term relief of chronic low back pain, and limited for long-term relief of chronic low back pain. The use of facet injections in the management of acute low back pain is not supported by evidence (Shen,et al., 2000; Flowerdew and Gadsby, 2006).

Acupuncture has a history dating back to 500 BC. Today it is considered as a cure for many ailments and disorders. It has been shown that by inserting needles, small myelinated nerve fibers, located in muscles, can be activated sending stimuli to the spinal cord activating the midbrain and hypophysis-hypothalamus axis thereby inducing analgesic effects (Stux et al.,1987). More recently, instead of using the conventional hand-stimulating method for needles, short frequency electrical stimulation (2-4 Hz) is used called electroacupuncture (EA) which obviates the need for acupuncture specialists to continuously stimulate the needles by hand during treatment sessions (Stux et al.,1987; Ter Riet et al., 1990 ). Conflicting evidence exists regarding the use of transcutaneous electrical nerve stimulation. In order to rate the effectiveness of this method in controlling pain in patients suffering from refractory chronic sciatic pain, we conducted a randomised single-blind controlled trial to compare this method with physiotherapy and a placebo.

## PATIENTS AND METHODS

Study design: This study was a randomized single-blind placebo-controlled trial. The target population included all patients referring to neurosurgery and orthopedic clinics at two major referral centers. All patients were under supervision of their physician (orthopedist, neurosurgeon, physiatrist), and clinical and paraclinical diagnostic methods (examination, MRI, etc.) were used to diagnose and confirm the sciatical origin of their pain and only those patients in which surgery was not indicated and pain was not controlled by analgesic medications were included in this study. Before commencing the study, it was first approved by the medical ethics committee of the research department of our hospital and informed consents were also obtained from the patients.

Inclusion criteria : 1. More than 20 yrs of age; 2. low back pain; 3. at least a 6-month pain duration; 4. confirmed sciatical origin of pain.

Exclusion criteria: 1. Indication for surgery; 2. Patient's reluctance to take part in the study; 3. Attendance of less than 5 treatment sessions; 4. More than 50 yrs of age; 5. Acupuncture contraindications such as systemic disease, existence of prosthesis, cutaneous infections, or coagulopathy.

Examinations and Measurements: The patients were classified into three treatment groups at random; these groups were: 1. Electroacupuncture; 2. Physiotherapy; 3. Placebo. Before commencement, all the patients were examined by a physician who was blinded as to the therapy group. Similar to other studies the intensity of pain, type and intensity of complications and restrictions caused by sciatic pain were registered For pain intensity assessment, MMPC visual scale was used and the measurement was made at the beginning and after 5th, 10th and 15th sessions. Patients were classified in to 4 groups according to the preliminary pain intensity: mild (0 to 25), moderate (25 to 50) , severe (50 - 75), very severe (75 to 100). Then, the response rate to therapy was studied in these groups. The pain reduction percentage was made by calculating differences of pain intensity in the last session with that at the onset of therapy, and dividing it by the preliminary pain intensity. By registering all complications and limitations at the first and last sessions of therapy, it was noted which complications resolved in each patient and the percent of resolved complications was calculated by dividing this number by their preliminary number. All the evaluations were made by a physician who was blinded to patient's therapy group. At the end of 5th , 10th , and 15th sessions, the patient's therapy contentment rate was registered. For each patient, the highest value was calculated for variables of pain reduction and contentment.

Treatment groups: 1. Electroacupuncture group (EA); in each session, 10-15 needles were inserted in painful and suitable points to an approximate depth of l to 5cm. Each session took up to 20 min and a current with an intensity of 2-10 mA and 4 HZ frequency was transferred. 2.Physiotherapy(SO); each therapy session took up to 30 min and hot packs , ultrasound, short wave diathermy, interferential transcutaneous electric nerve stimulation and other instruments for strengthening muscles were used.

3. Placebo group (SO); sessions were held as in the EA group, but instead of inserting needles in the body , they were set on the intended points by adhesive , and after turning the machine on, the current intensity was zero. Therapy sessions were held every other day for 1 month.

Analysis of data: Data analysis was done using SPSS.PC software. In analysis of the findings , in addition to descriptive methods, other methods, such as t-test, analysis of variance, cross tabulation, and Chi-square were conducted, and for analyzing differences of non-parametric variables or when the distribution was not normal, the Kruskal-Wallis and Mann- Whittney-U-tests were used. The confidence interval was assumed 95% and $P<0.05$ was considered significant.

## RESULTS

Of the 119 subjects, 54 (45.4%) were male and 65 (54.67%) were female. There were 41
patients in the EA, 38 in the PT and 40 in the SO group. In all groups, age, duration of
ailment, preliminary pain intensity and complications, were the same. The physician's
diagnosis of the origin of sciatic pain, in order of decreasing frequency, was:
osteoarthritis, discopathy of L4-L5 and L5-S1, canal stenosis, sacralisation,
osteoporosis, and scoliosis. There was no significant difference in pain etiology in
influencing the therapy groups. The most common complications in the patients were:
Buttock pain, paravertebral muscle spasms, lower limb paresthesia, and gastrosoleus muscle pain, respectively. Other complications and their prevalence are listed in table 1.

### Figure 1

Table 1: Prevalence of complications at the beginning of the study in each treatment group

| Complications | Prevalence In Population (%) | Prevalence in EA (%) | Prevalence in SO (%) | Prevalence inPT (%) |
|---|---|---|---|---|
| Buttock pain | 76.5 | 80.5 | 70 | 78.9 |
| Paravertebral muscle spasm | 59.7 | 61 | 47.5 | 71.1 |
| Feet paresthesia | 53.8 | 58.5 | 37.5 | 65.8 |
| Gastrosoleus pain | 53.8 | 58.5 | 45 | 57.9 |
| Lateral calf pain | 40.3 | 41.5 | 55 | 23.7 |
| Heel pain | 40.3 | 39 | 47.5 | 34.2 |
| Quadriceps reflex decrease | 40.3 | 36.6 | 62.5 | 21.1 |
| Achilles reflex decrease | 38.7 | 34.1 | 50 | 31.6 |
| Cold feet | 36.1 | 34.1 | 45 | 28.9 |
| Lordosis increase | 31.1 | 34.1 | 22.5 | 36.8 |
| Muscle weakness and atrophy | 30.3 | 22 | 45 | 23.7 |
| Scoliosis | 25.2 | 22 | 12.5 | 42.1 |
| Gait disturbance | 23.5 | 17.1 | 27.5 | 23 |
| Inability standing on toes | 22.7 | 26.8 | 22.5 | 18.4 |
| Inability standing on heels | 22.7 | 24.4 | 17.5 | 26.3 |
| Claudication | 16.8 | 14.6 | 12.5 | 23.7 |

The number of treatment sessions was different in the treatment groups: 9.2%±1 in EA, 11.7%±1.9 in PT and 8%±1.8 in SO. By analysis of variance by the modified LSD method for 0.05 P value, the difference among the three groups was significant. Pain reduction percent in EA, PT, and SO groups was: 62.1% ±18.6%, 52.5% ±17.5 and 17.5% ± 12.7 respectively and the difference among the three groups was significant. There was a significant difference in patient satisfaction from therapy among the three groups; in EA, it was the most and in SO, the least. This difference was confirmed by conducting Kruskal-Wallis test (Chi Square 41.94, $P<0.0001$). There was a significant difference in the number of complications resolved among the three groups: In EA group, it was 5.8± 2.5 in PT, 3.7±3.5, and in SO, 2±2.3. By performing analysis of variance with modified LSD method for 0.05 value, the difference was significant among the groups. The percentage of resolved complications was obtained by dividing the number of resolved complaints by their preliminary number; and for EA,PT and SO groups, was as follow: 89.3% ± 21.3; 51:8% ± 44.7; and 31.9% ±35.9 respectively. The difference between these three values was significant also. Pain reduction in females was significantly greater than males (49.7%±24 versus 37.2%±25.3; $P<0.001$), but the percentage of resolved complications and patient's therapy contentment did not reveal any differences between genders. The etiology of sciatic pain had no association with therapy response. The most responsive complications were: weakness and atrophy of lower limb muscles, increased lordosis, reduced Achilles reflex, gait disturbance and cold feet. Percentage of resolved complications in the population and in each treatment group individually is listed in table 2. EA was more effective than PT in resolving gait disturbance, paresthesia, cold feet, buttock pain, lumbar lordosis , gastrosoleus muscle pain, and lateral calf pain. PT was only significantly more effective than SO in controlling complications of buttock pain, reduced Achilles and quadriceps reflexes.

**Figure 2**

Table 2: Percentage of resolved complications in each treatment group

| Complications | PT % (No.) | SO % (No.) | EA % (No.) |
|---|---|---|---|
| Gait disturbance | 50(10) | 43(7) | 100(11)** |
| Muscle weakness and atrophy | 78(9) | 44(9) | 100(18)* |
| Feet paresthesia | 46(26) | 24(24) | 87(16)** |
| Quadriceps reflex decrease | 75(8)* | 20(15) | 92(25)* |
| Achilles reflex decrease | 91(12)* | 28(14) | 90(20) |
| Cold feet | 73(11) | 36(14) | 94(18)** |
| Buttock pain | 48(31)** | 6(33) | 82(28)* |
| Heel pain | 57(14) | 31(16) | 90(20)* |
| Gastrosoleus pain | 61(23) | 42(24) | 100(18)''* |
| Lateral calf pain | 33(9) | 11(17) | 81(22)** |
| Inability to stand on toes | 75(8) | 45(11) | 100(9)* |
| Increased lower back lordosis | 43(14) | 50(14) | 100(9) * |

Patient contentment in the severe pain group was greater than the others, but no significant correlation was observed in therapy response parameters and preliminary pain intensity. Pain reduction in this group was also greatest (29% in mild group, 37.1% in moderate, 51.6% in severe and 50.5% in very severe group). Pain reduction in the severe pain group and very severe groups were significantly more than the mild group ($P<0.05$). Percent of resolved complications did not differ significantly in these 4 pain groups. Regarding patient's pain intensity, a significant difference existed in pain reduction, (60.4%±11.7 in severe group versus 38.8% ± 18.6 in the moderate pain group;