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EFFECT OF ACCUPRESSURE PEN ON DISTANCE VARIABLE IN SCIATICA PATIENTS -A RANDOMIZED CONTROL TRIAL

Physiotherapy

Urja S.Vaidya* BPT, Nootan College of Physiotherapy,S.K. University.*Corresponding Author

Roshani S.Patel Assistant Professor, Nootan College of Physiotherapy, Sankalchand Patel University, Visnagar, Gujarat,India 384 315

ABSTRACT

Background: Sciatica is a radiating pain which is treated with manual accupressure and after a time electro accupressure came into introduction. **Aim And Objective: Aim:** To find out the effectiveness of accupressure pen to improve the distance variable **Objective:** To find out the effect of accupressure pen on pain and distance variable in sciatica patient To compare the experimental group to the control group **Method:** On the basis of inclusion and exclusion criteria 30 participants were selected. They were treated with electro accupressure pen for 3 alternative days / week for 3 weeks, after that re-assessment was taken with NPRS, Slump and Distance variables. **Results:** The data was analyzed using SPSS Version 21.Parametric test was used .In Group A improvement was seen **Conclusions:** Accupressure pen is effective to reduce pain and improve step length and stride length in Sciatica Patients

KEYWORDS

Sciatica, Acupressure Pen, Distance Variable, Pain, Slump

1. INTRODUCTION

The ancient Greeks were well-known for sciatic neuralgia and used the term 'sciatica, it describes the pain felt around the hip or thigh.[1]

Sciatica neuralgia is defined as 'pain in the distribution of the sciatic nerve due to pathology of the nerve itself'.[2] Radicular pain is defined as 'pain perceived as arise in a limb or the trunk caused by ectopic activation of nociceptive afferent fibers in a spinal nerve or its roots or other neuropathic mechanisms', According to these definitions, sciatic neuralgia is a form of radicular pain.[2]

Sciatica is a relatively common condition with a lifespan incidence varying from 13% to 40% with corresponding annual incidence of an episode ranges from 1% to 5%.[3,4]

There is no evidence showing the co-relation between sciatica and any masculinity or physical fitness. Risk factors for acute sciatica are divided according to Personal factors which include Age (peak 45-64 years) Increasing risk with height, Smoking and Mental stress, and Occupational factors which includes Strenuous physical activity—for example, frequent lifting, especially while bending and twisting.[5,6]

Acupressure is an ancient heritage of China.[2] It had given various advanced therapeutic potential against numerous disease conditions.

Acupressure is thoroughly based on physical pressure application demand on trigger points/acupoints which are to be found alongside the meridians. Classification of Acupressure techniques has been classified in various types depending upon its origin, method, and combination with additional techniques.[7]

The first Electro-Acupressure equipment was registered in 1979 by McCall FJ for electrical pulse acupressure treatment. A metallic protruding nodule (electrical conductor) was used for the stimulation of the acupoints. It was connected to electricity to transmit pulses of electrical energy in a preselected wave pattern to the nodule[8]. Later than that, in 1981; he registered pulse Electro-Acupressure device which was ear mounted.[9]

It is required to evaluate the chief complaint of the back pain patients, thus making pain assessment for each pain aspects, different assessment instruments exist and are discussed in terms of advantages and disadvantages.[10]

Gait deviations with slightly shorter stance resulting on the painful side, impaired gait resulting in the slight lurch due to the involved muscles contracts to protect.[11]

According to the results of previous studies, the slump test has high inter- therapist reliability which is consistent with reliability findings for related clinical tests of pain.[12]

NEED OF STUDY

According to previous researches there is only evidence to manual accupressure. So the need of the study is to assess the effectiveness of accupressure pen (electro accupressure) on Distance variable in sciatica patients.

2. AIM AND OBJECTIVE

AIM:

- To find out the effectiveness of accupressure pen to improve the distance variable

OBJECTIVE:

- To find out the effect of accupressure pen on pain and distance variable in sciatica patient
- To compare the experimental group to the control group

3. HYPOTHESIS

EXPERIMENTAL HYPOTHESIS

There is a significant effect of accupressure pen on the distance variable of sciatica patient.

NULL HYPOTHESIS

There is not significant effect of accupressure pen on the distance variable of sciatica patient.

4. METHODOLOGY

4.1 METHOD

Study design- Randomized control trial
Study setting- OPD- 5, Sports Department, Nootan College of Physiotherapy, Sankalchand Patel University, Visnagar.
Study technique- Simple Random sampling
Study population- 45 to 64 year {female or male}
Study sample- 30
Study duration- 3 weeks

4.2 Criteria for Selection

Inclusion Criteria:

Subjects with sciatica pain of sub-acute with age 45- 64 both included male and female.

Exclusion Criteria:

Subjects with any previous and recent spinal injuries, Spinal deformities, Lumbar surgery and Spinal malignancy and infections.

4.3 Materials Required:

Pen
Paper
Consent form
Accupressure pen
Gel
Measurement tape
Talcum power
Chalk

Plinth
Chair

Procedures of Data Collection

The research was approved by the ethics committee of Nootan College of Physiotherapy, SK University, Visnagar. CTRI number was CTRI/2021/01/030668. Firstly all subjects were educated about the study processes and the patients were asked to give their written consent and permit participation in this study. After the patients consent they were demonstrated the stimulation on the model first and after that they experienced the stimulation on themselves, and with the examination of slump test the patients who got positive slump, those 30 participants were enrolled in the study. The subjects were randomly divided into 2 groups by lottery method. Group-A was Experimental and Group-B was the control group. After dividing them into the groups, assessment and baseline data of the subjects were taken. Pre assessment was done with NPRS for the measurement of pain intensity and Gait parameters (distance variables: step width, step length, stride length and degree of toe out.) were measured with measure tape.

After the completion of all measurement Experimental group received accupressure pen stimulation. Control group was without any treatment from accupressure pen. This electrical stimulation protocol was given for 3 alternative day /week for 3 weeks. Outcomes measures of both groups were collected after 3 weeks.

INTERVENTION

Intensity was as per the patient's tolerance in the beginning it can be 2 or 3 and was gradually increased per week. The duration of each point must be 2-3 min (including the rest and fatigue parameters) each point was having specific location for the stimulation according to the ancient accupressure studies. With that the total duration of the treatment protocol will be of 12 to 15 min.

After each week intensity was increased last highest intensity of accupressure pen was 9*

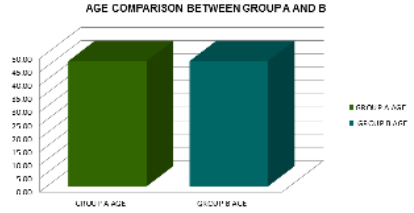
1st point: location (outer 1/3 of the line between greater trochanter and sacral hitus)
2nd point: location (in the depression anterior and inferior to the head of the fibula)
3rd point: location (in the middle of the glue teal sulcus)
4th point: location (mid point on the horizontal line drawn from tip of the lateral malleolus to the tendoachillis.

Figure: Electro Accupressure Pen On Point 4

Outcomes Measurement

Slump test is a tool use to detect the impingement of sciatica nerve. Along with that distance variables were taken for assessing and reassessing the gait after the treatment as the participants were having antalgic gait pattern, all the distance variables were taken by asking the participants to walk normally on the path of talcum powder and measurements were taken. NPRS was taken for checking the pain intensity before and after the treatment.

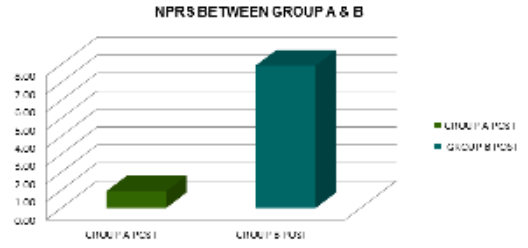
5. RESULT



Graph 5.1: Comparison Of Age Between Group A&b

Table 5.1: Age Between Group A & B

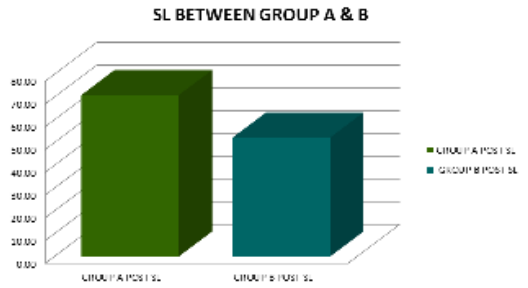
	MEAN	P VALUE
Age	47.07	1.000
	47.07	



Graph 5.2: Comparison Of Nprs Between Group A & B

Table 5.2: Nprs Between Group A & B

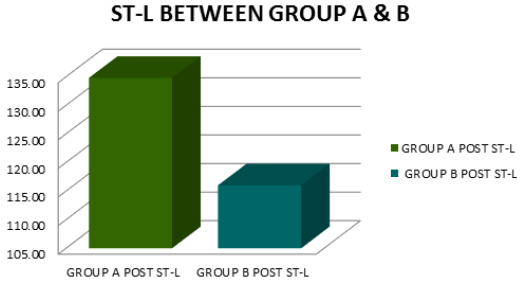
	GROUP	MEAN	P VALUE
NPRS	GROUP-A	.933	.000
	GROUP-B	7.466	



Graph 5.3: Comparison Of Sl Between Group A & B

Table 5.3: Sl Between Group A & B

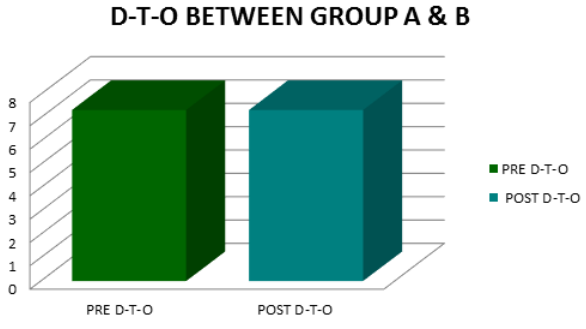
	GROUP	MEAN	P VALUE
SL	GROUP-A	70.87	.000
	GROUP-B	52.20	



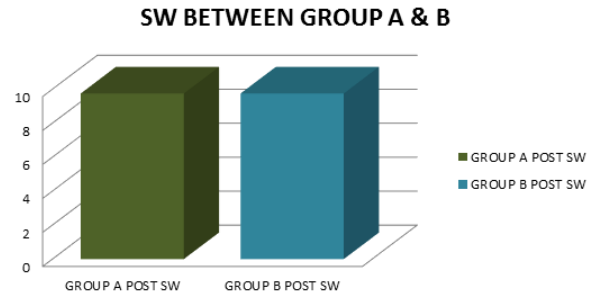
Graph 5.4: Comparison Of St-l Between Group A & B

Table 5.4: St-l Between Group A & B

	GROUP	MEAN	P VALUE
ST-L	GROUP-A	134.80	.001
	GROUP-B	116.00	



Graph 5.5: Comparison Of D-t-o Between Group A & B



Graph 5.6: Comparison Of Sw Between Group A & B

This study included 30 adults. For the statistical analysis, SPSS version 21.0 was used and level of significance for the entire test was kept to be 0.05.

Baseline characteristics showed in table 5.1, NPRS of between groups is in showed table 5.2, Step length of between group is showed in table 5.3, ,Stride Length between is showed in table 5.4, degree of toe out between group is showed in table 5.5 step width between group is showed in table 5.6

For age assessment independent sample t-test was used for comparison between groups and the result shows that there was no significant difference between groups.

Paired t-test was used for NPRS for within groups comparison which showed that NPRS into Group A at 3weeks ($p<.000$) and when comparison was done between groups A and B by independent sample t-test that showed significant improvement in Group A at 3 weeks ($p<.000$). In Group-B, there was no significant improvement in pain intensity showed by NPRS.

Step length of within groups was compared by paired t-test which showed that step length improved into group A at 3 weeks ($p<.000$) but there was no improvement showed in Group B and when comparison was done in between groups by independent sample t-test there was showed significant improvement in Group A at 3 weeks ($p<.000$). But there was no significant improvement in step length in Group B.

Stride length was compared Groups A and B with pared t-test and Group A showed significant improvement at 3 weeks ($p<.000$) in step length, And comparison of between Groups A and B was done with independent sample t-test and Group A showed significant improvement in 3 weeks ($p<.001$).

Step width was compared within Groups A and B with paired t-test and no significant changes were seen in any group at 3 weeks. Comparison was done between Groups A and B with independent sample t-test at 3 weeks and no significant were seen in any Group.

Degree of toe out was compared within Groups A and B with paired t-test and no improvement was seen in any group at 3 weeks. Comparison of between Groups A and B was done with independent sample t-test and no improvement was seen in any group.

6. DISCUSSION

The aim of the study was to find out the effectiveness of accupressure pen to improve the distance variable. Thirty subjects were selected as per the inclusion and exclusion criteria and divided into 2 groups. After that demographic data, patient's examination and investigation, patients were assessed. Group A (the experimental group) received the treatment with accupressure pen for 3 weeks, 3 alternate days/week and Group B (the control group) didn't received treatment by us. Parametric test was used within group analysis for outcome measurements. The result of the present study demonstrated that improvement in distance variable (step length, stride length) with that decrease in pain intensity was also noted with NPRS and after the treatment Slump was negative. There was no significant improvement in group-B. Also, there was a significant improvement in daily living activities of the patient of Group A than group B after the end of the training period. So, the experimental hypothesis is accepted here.

This study is unique and gives the introduction of electro accupressure as many researchers have conducted the researches in manual accupressure therapy but very few researches are in evidence of electro accupressure.

According to Wang, W., Tan, W., Luo, D. Acute pressure applied to sciatica nerve reduced the clinical pain, but did not alleviate cold pressure pain.[13]

On another hand, in acupressure, applying pressure with a hand at specific acupoints releases muscular tension which is used to balance the flow of the physiological energy [14]

According to J Wu gave introduction of new analgesic method for clinical pain, that method involves acute pressure stimulation on sciatica nerve.[15]

According to J, Jiang x the only target of their acute pressure block of sciatica nerve method is the sciatica nerve, their treatment provides release a variety of pains in different areas of the body.[16,17]

The reason behind the improvement in sciatica patients is the effect of accupressure pen direct on the afferent pain-receptive nerves, which brings direct signals to the brain and it includes two kinds of fibers - a fast, quite thick, myelinated "A δ" fiber that carries messages quickly with intense pain, and a small, unmyelinated, slow"C" fiber that carries the longer-term throbbing and chronic pain. Second is the large diameter Aβ fibers are nonnociceptive (do not transmit pain stimuli) and inhibit the effects of firing by Aδ and C fibers, so that's why it reduce the pain and improve step length and stride length in sciatica patients.

7. CONCLUSION

Accupressure pen is effective to reduce pain and improve step length and stride length in Sciatica Patients.

Limitations of the study:

- Small sample size
- An only Selected sample in Visnagar

Future recommendations of the study:

- Carry out the study with a large sample size
- Same protocol use for other radiculopathies
- Also, investigate other characteristics of gait parameters (temporal variables)

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List of Abbreviations

NPRS - Numerical Rating Scale
SL- Step length
ST-L - Stride Length
SW - Step Width
D-T-O – Degree of Toe Out

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