



Short Communication

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To Evaluate the Effects of Ultrasound Therapy in Increasing Hamstring Extensibility-A Pilot Study

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Abstract

This limitation in extensibility affects level of performance. Because of the reduction in hamstring flexibility and extensibility there will be deterioration of joint stability and if left untreated can lead to injury and joint dysfunction. When limitation in athletic performance has been reported, there is a routine practice of warm up and stretching exercises to maximize the muscles flexibility. But none of the researchers have used the electrotherapeutic modality in the management of flexibility issues in athletic population; hence the study has been done to throw new light on ultrasonic therapy in hamstring extensibility rather than relying on conventional stretching exercises and it proves that ultrasound therapy will have deleterious effects in improving the hamstring muscle extensibility.

Introduction

Three muscles that constitute Hamstring are Semi trendinosis, Semi membranous, Biceps femoris, it has been run down the back of the thigh and originates from ischial tuberosity and terminate at the lower leg. Normal population with sedentary living experiences the limitation in the length of hamstring muscle in activity of daily living but the difference in hamstring extensibility in athletic population is tiresome and they experience pain and deterioration in performance in their athletics events. Limited muscle extensibility is the common problem that affects various athletic populations [1]. This limitation in extensibility affects level of performance. Because of the reduction in hamstring flexibility and extensibility there will be deterioration of joint stability and if left untreated can lead to injury and joint dysfunction. However, the subjects with reduction in hamstring extensibility have adapted to faulty postural alignment. When athletic population is examined, the potential factor that contributes to high level athletic performance is flexibility and it is the key. It has been quoted by the previous researchers that improving an athlete's flexibility can turn on success in athletic endeavor [2]. Activity of daily living will become a burden if there is a hindrance in hamstring flexibility, Sit to Stand is a common activity of daily living, to accomplish these basic activities there should be hamstring extensibility [3].

Objective

To study the significant effect of ultrasound therapy in increasing the hamstring muscles extensibility.

Need for Trial

When limitation in athletic performance has been reported, there is a routine practice of warm up and stretching exercises to maximize the muscles flexibility. But none of the researchers have used the electrotherapeutic modality in the management of flexibility issues in athletic population; hence the study has been done to throw new light on ultrasonic therapy in hamstring extensibility rather than relying on conventional stretching exercises.

Methodology

Sampling method employed is convenient sample and a total sample size selected is 5 with the total study duration is 5 days.

Inclusion Criteria

Age group of 18-20 years were reported with reduction in hamstring extensibility and subjects with 20-40 degree of hamstring tightness in active knee extension test.

Exclusion Criteria

Patients with Hyper mobility, Subject under medication, with the history of Skin disease, Wounds, Neurological problems in lower limbs, Circulatory problems and any metal implants in the lower limb. Subjects with any infection (or) inflammation process in lower limb and Hypersensitive to cold were excluded.

Procedure

Initially after taking informed consent signed, degree of knee extension has been asses using a universal goniometer, the whole treatment procedure has been continued for 5 consecutive days. The subjects has been asked to lie down in prone lying with continuous mode of ultrasound by selecting 1MHZ frequency range, circular strokes has been applied to the hamstring muscle belly for the duration of 7 minutes to bilateral legs. Before positioning the subjects in prone lying, they have been asked about the respiratory discomfort in maintaining the same position for 14 minutes and positioning the patient without respiratory discomfort is the most needed thing for making the treatment protocol success [3-6].

Prior to the application of ultrasound therapy, local and general contraindications have been tested and the equipment has been sterilized. At the end of treatment with ultrasonic therapy, hamstring extensibility has been measured using universal-goniometer and the data’s has been tabulated to evaluate the difference in hamstring extensibility.

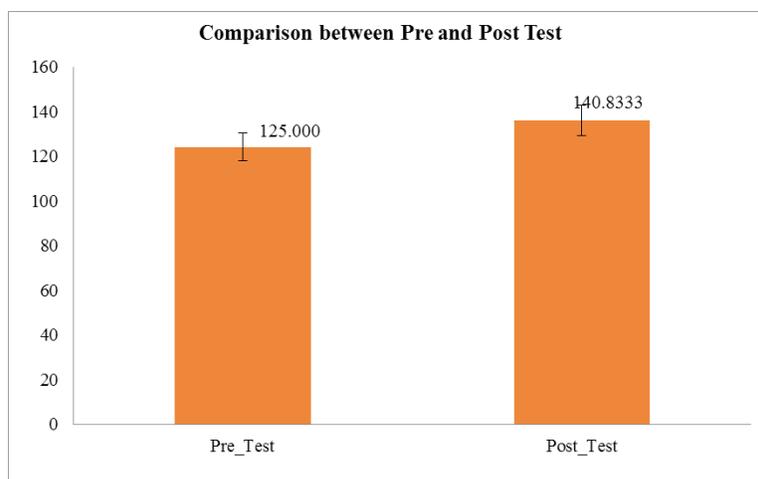
Data Analysis

A collected data were tabulated and analyzed by using inter-fereferential statistics. A paired t-test was used to compare the mean values of pre-test and post-test.

S.NO	AGE	SEX	WEIGHT	PRETEST	POSTTEST
1	22	M	50	110	139
2	22	M	55	120	139
3	22	F	58	120	138
4	19	M	52	125	135
5	20	F	50	125	140

Table 1: Pre-Test and Post Test Values of Hamstring Extensibility.

PAIRED SAMPLES STATISTICS							
GROUP A		MEAN	N	SD	SE	PAIRED T TEST	P VALUE
PAIR 1	PRE_TEST	125.1000	5	4.20657	1.06413		
	POST_TEST	140.8333	5	3.43234	0.76623		
						-17.170	0.0001 S



Results

The statistical results show that the ultrasound therapy which shows significant difference on hamstring extensibility of $p < 0.05$. Hence ultrasound therapy is most effective in increasing hamstring extensibility.

Discussion

This study shows the effect of ultrasound therapy to increase hamstring extensibility. The statistical significant result of the study for ultrasound therapy shows that there is marked increased in extensibility and reduction of tightness from pre-treatment to post-treatment of five days which was measured by goniometer. Which shows the statistical significance value of $p < 0.05$. A small sample ($n=5$) limited our ability to deduct any satisfactory significance difference between the mean of the group that ultrasound therapy alone can have this significant result without any additional exercise intervention and stretching. The possible mechanism for the ultrasound therapy facilitate of flexibility in this study by increasing the extensibility of collagen tissue, increased blood flow, increased local metabolism.

Conclusion

Ultrasound therapy was found effective in reducing hamstring muscle tightness, further studies are needed to compare cryotherapy and prolonged stretching with ultrasound therapy.

References

1. Draper D, Miner L, Knight K, Ricard M (2002) The carry-over effects of diathermy and stretching in developing hamstring flexibility. *J Athl Train* 37: 37-42.
2. Low J, Reed, A *Electrotherapy explained*. 3rd ed. Butterworth-Heinemann, Oxford 2000.
3. Cameron M (2018) *Physical agents in rehabilitation*. WB Saunders, Philadelphia (ed.).
4. Garrett C, Draper D, Knight K (2000) Heat distribution in the lower leg from pulsed short-wave diathermy and ultrasound treatments. *J Athl Train* 35: 50-55.
5. Draper D, Knight K, Fujiwara T, Castel C (1999) Temperature change in human muscle during and after pulsed short-wave diathermy. *J Orthop Sport Phys Ther* 29: 13-18.
6. Minton J (1993) A comparison of thermotherapy and cryotherapy in enhancing supine, extended-leg, hip flexion. *J Athl Train* 32: 233-237.