



Effect of Calf Stretching Versus Heel Walking in Nocturnal Leg Cramps in Older Individuals

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Abstract: Nocturnal leg cramps are sudden, episodic, painful, sustained and involuntary muscle contractions of the calf muscles, hamstrings, or foot muscles. The objective of this study was to find out the effect of calf stretching versus heel walking in nocturnal leg cramps in older individuals and aware them about this condition to avoid further complications. To find the effect of calf stretching versus heel walking in nocturnal leg cramps in older individuals. Study was conducted with 50 subjects in and around Karad. Subjects were selected as per inclusion and exclusion criteria and consent was taken. Included participants will be divided in 2 groups by simple random sampling method. Pre, and post assessment will be taken before treatment and after 6 weeks of the treatment respectively with the help of outcome measures. Group A was instructed to perform calf stretching and group B was instructed to perform heel walking. After pre-post assessment data was analysed with help of appropriate statistical methods. Statistical analysis of the recorded data was done by using the software SPSS version 20. Arithmetic mean and standard deviation was calculated for each outcome measure. Arithmetic mean was derived from adding all the values together and dividing the total number of values. MS Excel was used for drawing various graphs with given frequencies and the various percentages that were calculated with the software. According to pre-test and post-test analysis the result showed that calf stretching is statistically significant in reducing nocturnal leg cramps than heel walking in older individuals. Calf stretching is more effective than heel walking in older individuals having nocturnal leg cramps. The impact of calf stretching on nocturnal leg cramps needs to be taken into consideration.

Keywords: Nocturnal leg cramps, Calf stretching, Heel walking, Older individuals.

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1. INTRODUCTION

Nocturnal leg cramps are painful, lasts for nine minutes per episode. Leg cramps are usually nocturnal and associated with secondary insomnia. The posterior calf muscles are mostly involved, but cramps of the foot and thigh also are common.¹ Nocturnal leg cramps are sudden, episodic, painful, sustained and involuntary muscle contractions of the calf muscles, hamstrings, or foot muscles. The diagnosis of nocturnal leg cramps can be based on number of episodes of painful involuntary contractions of muscles affecting the leg, calf, or foot, which occur at night.² The Pathophysiology of Nocturnal leg cramps (NLC) are poorly understood. The primary morbidity is sleep disturbance and its next-day consequences. Sometimes there are medications used to prevent or reduce nocturnal leg cramps which have variable efficacy and may have side effects.³ Leg cramps usually occur at night and are precipitated by random muscle contraction or frequently, by voluntary stretching movements of the lower extremities. They are painful and a cause for much distress and anxiety.⁴ Nocturnal leg cramps can cause disturbance in activity of daily life. In addition to distress caused by pain, people having frequent cramps also report more disturbances of sleep, poorer quality sleep and more daytime somnolence than matched controls without cramps.^{4,5} Cramps caused by sudden intense involuntary skeletal muscle contraction of muscle and muscle group. It is painful and lasts up to a few minutes. This discomfort and tenderness may persist for hours afterwards.⁶ Commonly and frequently it is unreported to clinicians. Roughly 40% of people with nocturnal leg cramps report having symptoms at least three times per week and 5-10% report nightly characterized by sudden muscle tightness, it is commonly seen in the foot, calf. It last from seconds to minutes.⁷ It is associated with arthritis, peripheral vascular disease and female gender. It is also Idiopathic.^{6,8} Symptoms of nocturnal leg cramps can be difficult to manage because of uncertainties about etiology, appropriate diagnostic evaluation and optimal treatment. It is associated with secondary insomnia also.⁹ Muscle stretching can be used as alternative therapy for relaxation. It is very easy to perform and has a very low risk of side effects it often relieves the pain when a cramp has occurred. There are various physiological measures for reducing leg cramps calf stretching is one from that calf stretching three times a day for several weeks. It is successfully prevented cramps. For this stretching subject stands three feet from a wall, leaning against it with arms outstretched and gently tilted forward with the heels kept firmly in contact with the floor until a non painful stretch is felt in the calves.⁷ Nightly stretching also lessens the pain which is associated with any cramps that continue to occur. The pain of leg cramp is relieved by forceful stretching of the affected muscles, thus releasing the contraction.^{10,13} Heel walking will activate the muscle opposite to calf allowing to relax and also increases ankle stability and mobility, strengthens shin and calf muscles, improve balance. Muscle cramps ultimately results from rapid repetitive firing of motor unit action potentials at a rate much higher than

involuntary contractions.^{11,14} Heel walking is weight bearing exercises works the muscles that supports the front of ankle and strengthens the feet too. Tibialis anterior is important in actively dorsiflexing the ankle, it also has a role to play in controlling pronation as the foot loads on the ground. Walk barefoot on your heels for 20 steps repeat this for three sets.¹² Therefore the aim of the study was to find out the effect of calf stretching versus heel walking in nocturnal leg cramps in older individuals.

2. METHODOLOGY

This study is an experimental study undertaken to find out the effect of calf stretching versus heel walking in nocturnal leg cramps in older individuals and to create awareness about it in them. Older individuals with age groups of 55 to 75, both males and females were included. Patients with a history of leg surgery, any neurological disease, structural deformity of leg, patients who have already undergone surgery of ankle, patient who have varicose vein and those who are unwilling to participate are excluded. Written consent of the patient was taken. The study is ethically approved. The subjects were assessed with Visual analogue scale and Delphi study items for nocturnal leg cramps. Included participants were divided into two groups by simple random sampling method. Group A received a hot moist pack for 10 minutes, then calf stretching was performed in 3 sets, each set for 30 sec hold for 3 times in a day upto 6 weeks. Group B received hot moist pack for 10 minutes, then heel walking was done in 3 sets, each set for 30 sec walk on heel for 3 time in day upto 6 weeks

2.1 Ethical Clearance

The institutional ethical committee has hereby given permission to initiate the research project titled, Effect of Calf Stretching Versus Heel Walking in Nocturnal Leg Cramps in Older Individuals.

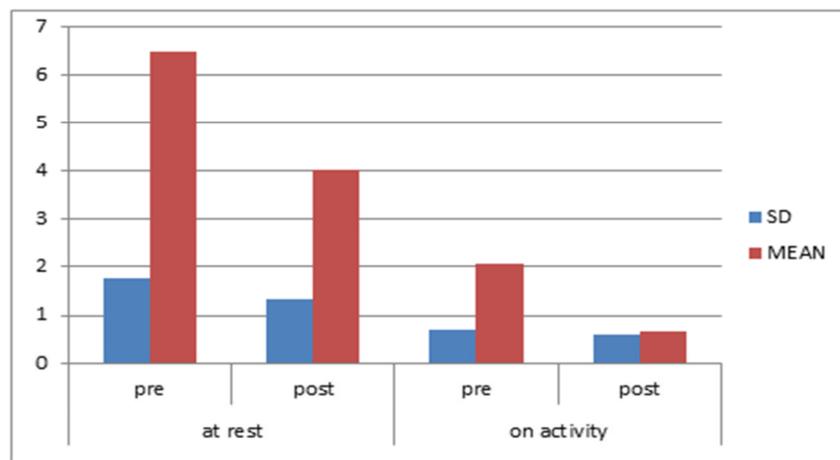
Ethical clearance number: KIMSDU/IEC/05/2019

3. STATISTICAL ANALYSIS

Statistical analysis of the recorded data was done by using the software SPSS version 20. Arithmetic mean and standard deviation was calculated for each outcome measure. Arithmetic mean was derived from adding all the values together and dividing the total number of values. MS Excel was used for drawing various graphs with given frequencies and the various percentages that were calculated with the software.

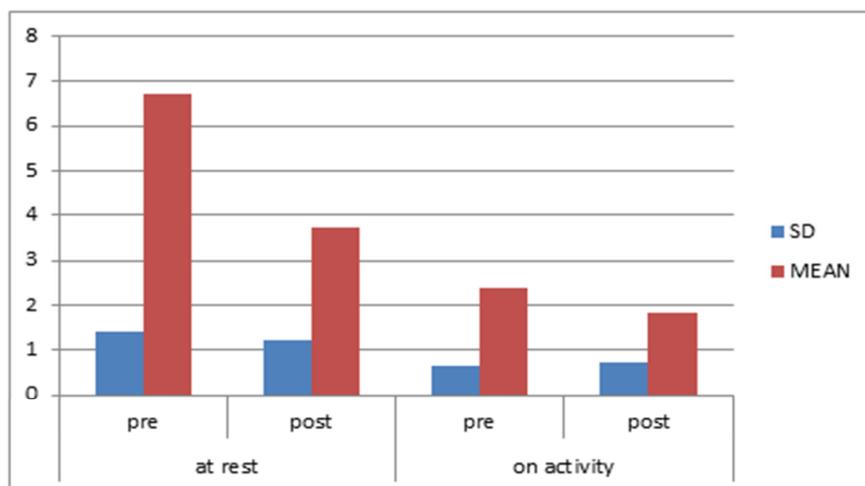
4. RESULTS AND DISCUSSION

The study was conducted among 50 individuals in Karad of Satara District in Maharashtra. 30 females and 20 males participated. on x axis: pre and post visual analog scale and on y axis: number of visual analog scale



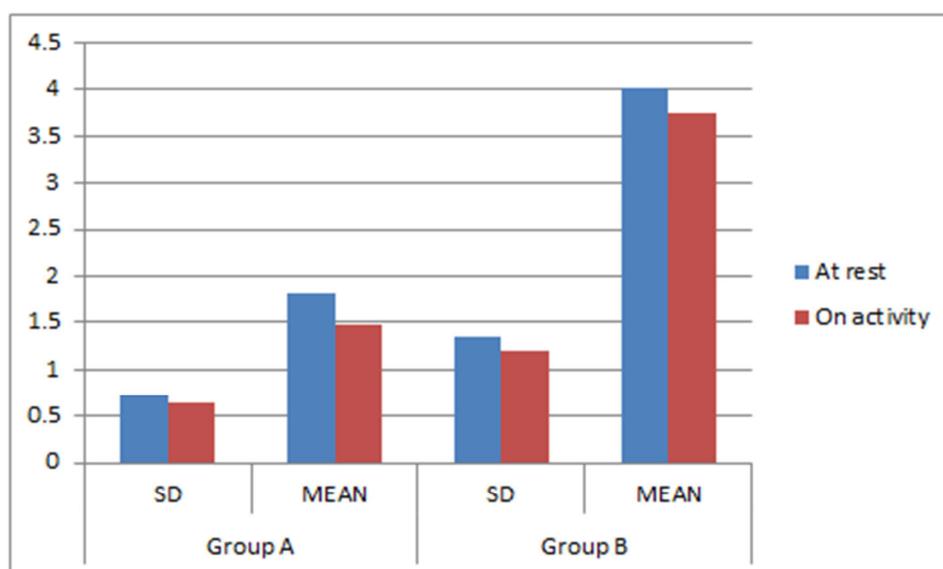
Above graph represents that At rest, pre-post Visual analog scale of calf stretching is extremely significant with p value >0.0001
 On activity, pre-post Visual analog scale of calf stretching is extremely significant with p value >0.0001

Fig.1 Pre and Post Visual analog scale of calf stretching



Above graph represents that At rest, pre-post Visual analog scale of Heel walking is extremely significant with p value >0.0001
 On activity, pre-post Visual analog scale of Heel walking is extremely significant with p value >0.0001

Fig. 2 Pre and Post visual analog scale of heel walking



In group A and group B, post Visual analog scale of calf stretching and heel walking is not significant. In this graph, calf stretching is more effective than heel walking is seen. So Group A is more effective than Group B.

Fig 3. Comparison between calf stretching and heel walking

Our aim was to study the Effect of Calf stretching versus Heel walking in nocturnal leg cramp in older individuals with an objective of finding the benefits of each exercise and comparing its effects to fulfill the aim of the study. The individuals included in this study were older individuals who are willing to participate, age group of 55 to 75, both males and females and nocturnal leg cramps which was assessed using Delphi study items and visual analogue scale. The individuals were scored according to outcome measures were included in this study patients with history of leg surgery, any neurological disease, structural deformity of leg, patients who have already undergone surgery of ankle, patient who have varicose vein and those who are unwilling to participate are excluded.^{6,8} The study was conducted with 50 subjects in and around Karad. Subjects were selected according to the inclusion and exclusion criteria. Both male (20) and Female (30) subjects were included for the study. Subjects were explained about the procedure of the study. Written consent was taken from them and they were also asked if they suffered any other musculoskeletal problems.¹⁰ They were randomly divided into two groups (group A and group B) with each containing 25 participants. Group A was asked to perform calf stretching according to given method and group B was asked to perform heel walking. This study was carried out for 6 weeks on a daily basis and pre and post assessment was taken using VAS scale after 6 weeks.^{7,13} After the pre and post assessment the data was statistically analysed. The results of this study showed that there is a significant difference in reducing the pain and quality of life in both groups (Calf stretching and Heel walking) in nocturnal leg cramps in older individuals.¹⁰ Unpaired t test was used to analyse the effect of calf stretching and showed that it was extremely significant in VAS score. Hence it strengthens the calf muscle and improves blood supply which in turn reduces pain and improves quality of life. Unpaired t test was used to analyse the effect of Heel walking and showed that there was significance difference in VAS score. This exercise will reduce pain and improve quality of life. Comparison of VAS between groups was done by using Paired t test to find out the effectiveness between the groups. Statistical analysis revealed

that there was a very significant difference found in pain intensity using VAS in both groups post treatment. Hence it showed that pain intensity has decreased and improves the quality of life. According to this calf stretching is more effective than heel walking to improve nocturnal leg cramps in the participants.

5. CONCLUSION

On the basis of results it is concluded that the Calf stretching was significantly more effective than heel walking in older individuals having nocturnal leg cramps. The impact of calf stretching on nocturnal leg cramps needs to be taken into consideration.

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7. AUTHORS CONTRIBUTION STATEMENT

Mrs.Ashwini Pawar conceptualized and gathered the data with regard to this work. Dr. Khushboo Bathia, Dr. Amrutkuvar Rayjade and Dr. Smita Patil analyzed these data and necessary inputs were given towards the designing of the manuscript. All authors discussed the methodology and results and contributed to the final manuscript

8. CONFLICT OF INTEREST

Conflict of interest declared none.

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