

# CORRELATION BETWEEN SCIATIC NERVE MOBILITY AND PHYSICAL ACTIVITY IN SCHOOL GOING SEDENTARY TEENAGE GIRLS

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## ABSTRACT

**Background and Purpose:** A sedentary lifestyle is a type of lifestyle with no or irregular physical activity. Sedentary activities include sitting, reading, watching television, playing video games, and computer use for much of the day with little or no vigorous physical exercise. As there is no physical activity the neuro dynamics may alter. So, the purpose of the study was to test the sciatic nerve mobility in sedentary school going teenage girls.

**Objectives:** The aim of the study is to correlate the physical activities with sciatic nerve mobility in sedentary school going teenage girls which is measured by using straight leg raising test.

**Methodology:** It is a cross-sectional study done on 400 school going teenagers. The subject's habit of playing, frequency of playing, hours of playing are considered in the study. Sciatic nerve mobility is assessed using straight leg raising test in all the subjects. Habit and frequency of playing are correlated with the sciatic nerve mobility.

**Results:** All the results are analyzed using Pearson's correlation coefficient. The P value is 0.0721, considered not quite significant and the r value is 0.1648.

**Conclusion:** The results concluded that there is a weak correlation between sedentary school going teenagers and the sciatic nerve mobility. The school going teenage girls is developing sedentary life style which is a risk factor for various non communicable diseases.

**Keywords:** Sedentary life style, straight leg raising test, sciatic nerve mobility, habit of playing.

## INTRODUCTION

Clinical neurological examinations are an integral part of clinical decision making for determining neural involvement in individuals with altered physical function and activity participation. One aspect of a standard neurological examination involves assessing the sensitivity of peripheral nerves to limb movement, termed mechanosensitivity. Mechanosensitivity is thought to be a normal protective mechanism that allows the nerves to respond to the mechanical stresses imposed upon them during movement<sup>1</sup>. Neurodynamic tests are used to assess the nervous system's mechanosensitivity through monitoring the response to movements that are known to alter the mechanical stresses acting on the nervous system. The most common lower quarter neurodynamic test is the passive straight leg raise (SLR) test<sup>2,3</sup>. The basic SLR test consists of the tester performing passive hip flexion, with the patient in a supine position and the knee held in full extension<sup>4</sup>. The proposed interpretations of a "positive" test include considerations for whether the test (1) reproduces the patient's symptoms, (2) identifies asymmetry between limbs or significant deviation from norm, and (3) induces changes in symptoms by distant joint movement, also called "sensitizing movements." The third consideration is critical to identify the nervous system as the source of limitations to

movement and is termed "structural differentiation." Sensitizing movements involve adding a limb movement distant to the location of symptoms that would affect the neural structures in the limb without affecting the nonneural tissue local to the area of symptoms<sup>5,6,7</sup>.

Ankle dorsiflexion is a common sensitizing maneuver for SLR testing.<sup>8,9,10</sup> Further support for the use of ankle dorsiflexion as a sensitizing maneuver is provided by findings from a cadaveric study, in which prepositioning the ankle in dorsiflexion created distal movement in the tibial nerve at the knee and ankle. Clinically, prepositioning the ankle in dorsiflexion leads to a reduction of hip range of motion during SLR testing, when taken to maximal resistance to hip flexion in people with low back pain and healthy individuals. Neurodynamic testing can also produce increases in local muscle tone. SLR testing without ankle dorsiflexion has been shown to induce hamstring and gluteal muscle activity when the hip flexion is held at the maximally tolerated position.<sup>11</sup> Prepositioning in ankle dorsiflexion induces hamstring muscle activation earlier in hip flexion range during SLR testing in healthy individuals. Muscle activity provoked during the sensitized SLR test is thought to provide a protective mechanism to restrict further movement and to help prevent overstretch nerve injuries. No study to date has simultaneously explored the differences in range of motion, symptoms, and muscle

responses for SLR neurodynamic testing at both the onset and maximally tolerated symptoms in healthy individuals. In addition, no study has provided statistical analysis of both proximal/distal and flexor/ extensor muscle activity during SLR neurodynamic testing. It is important to understand the specific effects of sensitizing maneuvers at each of these testing end points in normal asymptomatic individuals to guide clinical decision making and to help establish standardized testing methodology in symptomatic populations. The same test end point should be utilized in the uninvolved and involved limbs in people with nerve injuries, which necessitates understanding the normal response of the nervous system on the uninvolved limb.

A sedentary lifestyle is a type of lifestyle with no or irregular physical activity. A person who lives a sedentary lifestyle may colloquially be known as a slob or couch potato. It is commonly found in both the developed and developing world. Sedentary activities include sitting, reading, watching television, playing video games, and computer use for much of the day with little or no vigorous physical exercise. A sedentary lifestyle can contribute to many preventable causes of death. Screen time is the amount of time a person spends watching a screen such as a television, computer monitor, or mobile device. Excessive screen time is linked to negative health consequences.<sup>12</sup> There are many studies on the neuro dynamics of the upper limb and the lower limb but there is no study done on testing the sciatic nerve mobility in sedentary school going teenage girls in relation to the chances of sciatica incidences. So our aim is to survey on the changes in the sciatic nerve mobility in the school going teenage girls.

**METHODOLOGY**

It is a cross- sectional study done on school going teenage girls of age between 12-16 years with a BMI of 18.5-24.9. All the participants who were not having history lower limb surgeries and any deformities, skin contractures were asked to get parents consent forms before starting the study. Based on the inclusion and exclusion criteria 400 subjects were included in the study. All the subjects were explained about the test prior to start the study. Sciatic nerve mobility was tested by using SLR.

When performing the straight leg raise test the patient is positioned supine in the absence of pillows. The clinician lifts the subject’s leg by holding at the posterior side of ankle while keeping the knee in a fully extended position. The clinician continues to lift the subjects’s leg by flexing at the hip until pain is elicited or end range is reached. Neurologic pain which is reproduced in the leg and low back between 30-70 degrees of hip flexion is a positive result of lumbar nerve root compression at the L4-S1 levels. In order to make this test more specific, the ankle can be dorsi flexed and the cervical spine flexed. This increases the stretching of the nerve root and dura. Pain at less than 30 degrees of hip flexion might indicate acute spondyloithesis, gluteal abscess, disc protrusion or

extrusion, tumor of the buttock, an acute dural inflammation, a malingering patient, or the sign of the buttock. Pain at greater than 70 degrees of hip flexion might indicate tightness of the hamstrings, gluteus maximus, hip capsule or pathology of the hip or sacroiliac joints. A highly specific test that can aid in the diagnosis of a herniated nucleus pulposus is the crossed straight leg raise test.

**QUESTIONNAIRE**

➤ Name: \_\_\_\_\_ Age : \_\_\_\_\_

➤ Class/level : \_\_\_\_\_

➤ Name of the school: \_\_\_\_\_

1. Do you have a habit of doing exercises/ playing games?  
Regularly A) Yes B) No

2. How frequently you do exercises?  
A) Daily B) Once in a Week C) Occasionally  
D) Never

3. If doing regularly how many hours you do exercises/ playing exercises?  
A) < 30 min B) 30 min to 1 hour  
C) 1 hour to 2 hours D) > 2 hours

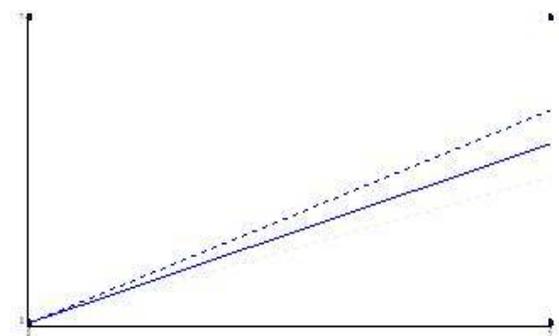
4. If you are playing games regularly, what kind of games you play?  
Answer: \_\_\_\_\_

**SLR TEST RESULT:**

Table 1: Questionnaire asked to know the habit of exercises.

**DATA ANALYSIS**

Correlation of habit of playing and sciatic nerve test result



Graph 1: correlation between physical activity and sciatic nerve mobility

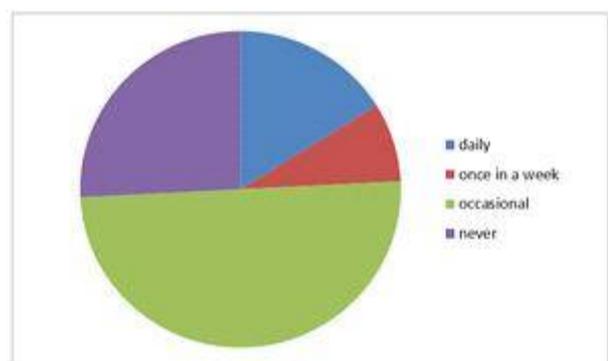


Fig 1: Exercise habits of school going teenage girls.

## RESULTS

All the results are analyzed using Pearson's correlation coefficient. The P value is 0.0721, considered not quite significant and the r value is 0.1648, shown after correlating the sciatic nerve mobility in sedentary school going teenage girls.

## DISCUSSION

The current study reviewed to correlate the sciatic nerve mobility in sedentary school going teenagers with the correlation coefficient ( $r$ ) =0.1648 and the two tailed p value is 0.0721, considered not quite significant. This means there is correlation between sedentary life style and restricted sciatic nerve mobility. But the p value is not giving statistical strength to the above statement.

Only two high quality studies and three non high quality studies provided significant evidence of association between low back pain and sedentary life style. Epidemiological factors found to influence incidence of sciatica included increasing height, age, genetic predisposition, walking, jogging (if a previous history of sciatica), and particular physical occupations, including driving.<sup>13</sup> Some studies also investigated the effect of physical activities, as well as influence of different activity levels namely light, moderate, heavy etc How ever being physically active doesn't necessarily mean not having a sedentary life style on suffering sedentary behaviors. In this case, only sedentary activities including frequency of playing, habit of playing were of interfere in the present review<sup>14</sup>. Stimulation of leisure time physical activity may constitute one of the means of reducing musculoskeletal morbidity in the working population, in particular in sedentary workers<sup>15</sup>. The results of some studies are not compatible with the old myth that spinal growth actually contributes to LBP. But abundant growth in early adolescence may be a risk factor for subsequent LBP<sup>16</sup>.

This study exposed another interesting factor that 78% of the school going teenage girls are inactive only 32% of girls are interested of having daily exercises this means that the sedentary life is having its roots from the school age itself. Reduced activity leads to adhesions formations in the muscles and decreased neural mobility inside the neural sheath and muscle. Ultimately decreased mobility is a major cause for developing reduction in sciatic nerve mobility.

## CONCLUSION

The results concluded that there is a weak correlation between sedentary school going teenagers and the restricted sciatic nerve mobility. This study is not able to give statistical strength to support the sedentary lifestyle is one of the risk factor to get sciatica, but it does not denied the chances of developing structural changes in the nerve. One thing is clear that the schools going teenage girls are developing sedentary life style which is a risk factor for various non communicable diseases.

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