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ORIGINAL ARTICLE

Frequency of reduced hamstring flexibility in prolong sitting (6-8 hours) among office workers

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ABSTRACT

Background: Hamstrings are the muscles of posterior thigh which include Semi membranous, Semi trendiness and the Biceps Femoris. These muscles are extensors of the hip and flexors of the knee and they act opposite to the extensors of the knee.

Objective of Study: To find the frequency of reduced hamstring flexibility in prolong sitting (6-8 hours) among office workers.

Methodology: This study was carried out in the banks and offices of Lahore from November 2015 to May 2016. According to inclusion criteria total 272 subjects were included in the study. Hamstring tightness was assessed by 90-90 or active knee extension test with the help of Standardized Goniometer. Data was recorded on self-made questionnaire from the subjects after 6-8 hours of their working in the afternoon and analyzed by using SPSS version 20.

Results: On the basis of analysis of data hamstring flexibility was reduced in 233 subjects n= 233; 85.7% and 39 subjects shown normal range of motion
n=39, 14.3% .It was also seen that individuals having 8 hours of sitting with less extra-curricular activities were more sufferers.

Conclusion: It was concluded that prolonged sitting is an important factor causing reduced hamstring flexibility and it can be prevented by using ergonomically design chairs. By adopting correct postural alignment and by adding frequent rest breaks during prolong sitting.

Key Words: Reduced hamstring flexibility, Prolong sitting.

INTRODUCTION

Hamstrings are the muscles of posterior thigh which include Semimembranosus, Semitendinosus and the Biceps Femoris. These muscles are extensors of the hip and flexors of the knee and they act opposite to the extensors of the knee. [1] Hamstrings arise from the ischial tuberosity .and inserts on the tibia and fibula bones on their condoyle and heads. [2]Hamstring tightness occurs due to decreased muscle flexibility and ability to deform which results in reduced range of motion (ROM) around a joint. Inelasticity is actually a deformation of the muscle fibres which in turn leads to decrease range of motion of the joint. [3] The action of the hamstring muscle is to control the extension at knee and perform the flexion at knee. In the same manner, it performs the extension at hip and it controls the flexion at hip it also induces rotations and tilting of the pelvis anteriorly and the posteriorly. The high rate of people suffering from tight, inflexible hamstrings is related to occupations that require sitting for long hours. Sitting in a typical office chair makes the hamstring inactive and places them in a shortened position. Repetitive prolonged sitting eventually leads to shortening of hamstring muscles. [4] In six to eight hours of sitting, degeneration and atrophy of the muscles start which leads to the shortening, tightness and reduced flexibility of hamstring muscles. The most common type of injury and deformation faced by the office workers is hamstring tightness which may lead to low back pain. Due to the frequent hamstring tightness, workers cannot perform their duties well. When the performance is overall affected it leads to the down morale and lower self confidence in the office workers. The most important thing about reduced hamstring flexibility is that it heals very slowly. If there is awareness regarding the hamstring flexibility, it can be avoided. If we avoid this tightness and injuries it will help in reducing the cost of the treatment and help in the better performance of the office workers. By this health can be promoted in the country and self-confidence and morale will be raised. [5]There is limited literature found on this topic although it is an important topic. Few researches were found globally but none of them from Pakistan. Major problem faced during reviewing of the literature was the socioeconomic status, culture, weather and genetics of those countries because these were different from Pakistan. Literacy ratio is

very much improved in Pakistan therefore jobs of eight to ten hours are increasing. Now a days more than seventy per-cent of the office workers work six to eight hours in the sitting position. Staffs which are mostly bound to sit on the chair because of their nature of work are telephone operators, receptionists, bankers and data entry operators. All these persons spend their maximum time in the sitting position. [6]

Information Technology and computer technology advancement has increased the sitting time of people People can do all their work like reading , writing and attending meetings without leaving desks. In the sitting positions biomechanics of the person also changes. When the person sits from 6 to 8 hours, he/she faces mechanical stresses which can be short term or long term .The right manner of sitting position is to sit with erect back and with hip and knee in 90 degree of flexion with proper arm rests. In sitting the major change in the mechanics occur at the hip joint, the change comprises of sixty five per-cents of the total mechanics of the lower limb or the body. Spinal curvature changes due to these mechanical stresses. Pressure distribution is such that the vertebras approximate more in the frontal aspect than in the posterior aspect. Disc in between the vertebras impinge which in turn impinge the nerve and it leads to the sciatic pain .In seventy five per cent of the cases it happened because of the hamstring tightness/ reduced flexibility. The most adverse events that leads to the pain in the back and hamstring tightness are the ergonomic factors. Due to the ergonomic factors, workers face extreme pain in improper sitting posture. [7] The rationale of the study is creating awareness among office workers regarding correct postural alignment, frequent rest breaks and use of ergonomically designed chairs during prolong sitting in duty hours.

METHODOLOGY

This observational study was carried out in the banks and offices of Lahore from November 2015 to May 2016. We calculated the sample size of 272 subjects by using Rao Soft .All the subjects were office workers, having 6 to 8 hours of sitting, between the age group of 20 to 50 years with no musculoskeletal deformity. Individuals with any recent history of trauma, history of previous surgery, any spinal deformity and any limb length discrepancies were excluded from the study. Basic Demographic data (name, age, gender) and contact details of participants were taken. We measured hamstring tightness/flexibility by using 90-90 or active knee extension test. After taking consent from subjects, data was recorded on the standard questionnaire. This was entered into SPSS version 20.0 and analysed properly. The data was collected by researchers themselves.

RESULTS

Table1: Gender

	Frequency	Per cent	Cumulative Per cent
Male	226	83.1	83.1
Female	46	16.9	100.0
Total	272	100.0	

According to the research, It was seen that out of total 272 participants n=226;83.1% were males and n=46;16.9% were females.

Table 2: Number of hours spent in sitting on a chair

	Frequency	Per cent	Cumulative Per cent
6 hours	4	1.5	1.5
7 hours	14	5.1	6.6
8 hours	254	93.4	100.0
Total	272	100.0	

According to my research, It was seen that n=4, 1.5% individuals spent 6 hours n=14, 5.1% individuals spent 7 hours and n=254,93.4% individuals spent 8 hours in office in sitting on chair.

Table 3: Number of hours spends on extra-curricular and sporting activities per week

	Frequency	Valid Per cent	Cumulative Per cent
Nil	257	94.5	94.5
2 to 4 hours	15	5.5	100.0
Total	272	100.0	

According to the research, It was seen that the individuals who spent nil or no time in sports and extracurricular activities were n=257, 94.5% and individuals who spent 2 to 4 hours in extracurricular activities were n=15, 5.5 % only. This inactivity leads to the reduced hamstring flexibility.

Table 4: Reduced flexibility according to 90-90 or active knee extension test

	Frequency	Per cent	Cumulative Per cent
Reduced flexibility present	233	85.7	85.7
Normal flexibility	39	14.3	100.0
Total	272	100.0	

According to the research, it was seen that by 90-90 or active knee extension test hamstring flexibility was reduced in n= 233, 85.7% and in n= 39, 14.3% there was normal hamstring flexibility.

DISCUSSION

The posture, working style and duration of work has impact on function and structure of muscle. Felipe Jose and Andriana Ribiero has reported the influence of prolong sitting on hamstring extensibility and low back pain had reported in their study that prolong sitting without breaks leads towards decreased flexibility of hamstring muscles which ultimately becomes risk factor for developing low back pain and decreased work efficiency. In this study we have quantitatively observed the same results that sitting for prolong period of time, as in the case of office workers specially bankers leads towards tightness/reduced flexibility of hamstring muscles. In study it was observed that average time period of 6-8 hours of daily sitting had affected the hamstring muscle in regard of flexibility. The similar study reported that decreased hamstring flexibility had affected their work efficiency, ADL quality badly and even some patient reported the low back pain due to reduced hamstring flexibility.[8]

This study proved the association between reduced hamstring flexibility and prolong sitting in office workers and there was no significant association between hamstring tightness and height and weight of individuals. It was also seen that the individuals who spent nil or no time in sports and extracurricular activities suffered from reduced hamstring flexibility and individuals who spent 2 to 4 hours per week in extracurricular activities were relatively better in regard of hamstring flexibility. [9]It is mentioned in their researches that 90% or more individuals face hamstring tightness only because of prolong sitting in their work places and lack of sports and extra-curricular activities. They also described that sitting type also matters a lot, if the sitting is comfortable then there would be less chances of developing hamstring tightness .[10]On the basis of result of this study it is proven that posture, working style and working duration with and without breaks had impact on the movement system which ultimately leads towards musculoskeletal and other systemic problems.

CONCLUSION

It is concluded from the study that the subjects with six to eight hours of daily sitting with very less physical activities experience reduced hamstring flexibility. It was seen that males are more prone towards developing hamstring tightness/reduced flexibility than females of same routine. Results show no significant relationship between decreased flexibility of hamstrings and height and weight of patient. It is also concluded that prolong sitting is an important cause of reduced hamstring flexibility which can be avoided with comfortable sitting, by

adapting correct postural alignments ,by adding some physical activities and frequent rest breaks in their routine.

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