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Original Research Article

Incidence of Forward Head Posture and Associated Problems in Desktop Users

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ABSTRACT

Background: Forward head posture is a postural problem that is caused by several factors including sleeping with the head elevated too high, extended use of computers, laptops & cell phones, lack of developed back muscle strength and lack of nutrients. It is identified by measuring craniovertebral angle. Measurement of craniovertebral angle is from C7 spinous process to tragus of ear. Normal craniovertebral angle is 49.9 degrees. The reliability of photographic postural analysis is >0.972. It is cost effective, gives accurate angle and has less errors. Early diagnosis of forward head posture will help to minimise the consequences. The objective of this study was to find the percentage of forward head posture in laptop users in adults using MB ruler and to find the associated problems of forward head posture in desktop users on Visual Analogue Scale and Cervical Range of Motion. Age group of 30-40 years both males and females were included. 100 individuals were included.
Results: Means of Range of Motion and Visual Analogue Scale were compared. Spearman's Correlation Test and Chi Square Test were applied. In all variable the P>0.05 was considered to be not significant. This showed that, Forward Head Posture was not associated with Pain and Cervical Range of Motion.
Conclusion: The study concluded that there is no relation between forward head posture and pain, and forward head posture and range of motion of cervical spine.

Keywords: Forward head posture, desktop users

INTRODUCTION

Forward head posture (FHP) is the anterior positioning of the cervical spine, this posture is called as "text neck", "scholar's neck, "wearies neck", "ihunch", "reading neck". It is a postural problem that is caused by several factors including sleeping with the head elevated too high, extended use of computers, laptops & cell phones, lack of developed back muscle strength and lack of nutrients such as calcium. [1] Forward head posture afflicts a large percentage of population and can cause significant neck pain, while in this posture; the skull is carried anterior to the body's center of gravity there by informing a chronic condition that puts increased stress on the postural musculature of the entire spine especially cervical spine. [2] Forward head posture is identified by measuring craniovertebral angle. Measurement of craniovertebral angle is from C7 spinous process to tragus of ear. [3] Forward head posture is common in all age groups, mean age group in males is 22-44 years and normal craniovertebral angle in them is

about 48.8 degrees, mean age group in females is 23-66 years and normal craniovertebral angle in them is about 47.6 degrees. Normal craniovertebral angle is 49.9 degrees. [4] Effects of forward head posture includes: increased age associated with reduced cervical ROM, greater thoracic kyphosis associated with greater cervical flexion, greater forward head posture associated with greater deficits in cervical rotation and flexion ROM and these findings agree with five other studies. [5] The tasks of using laptops are increasing everyday particularly in education, business, publishing, banking and even entertainment. Most laptops are designed with the screen joined to the keyboard, making it impossible to adjust separately in terms of screen height and distance. This leads to prolonged flexion at cervical spine with consequent higher activity in cervical erector spinae and upper trapezius muscles, with a posture in which the trunk is slightly inclined backward. This leads to a consequent forward head and trunk flexion adopted as a fixed postural habit. [6] Effects of using laptops on cervical spine: Excessive laptop use frequently results in musculoskeletal disorders or neck and shoulder. The posture of staring at a monitor, located below the height of eyesight, makes the head move forward, anterior curve in the lower cervical and posterior curve in the upper thoracic vertebrae could be exaggerated and this is known as forward head posture or turtle neck syndrome. [7] Using a laptop almost forces you into bad posture by making the spine C-shaped. Long term use of laptop may cause neck shoulder and arms pain. Head in forward posture can add upto 30 pounds of abnormal leverage on the cervical spine, this can pull the entire spine out of alignment. Forward head posture may result in the loss of 30% of vital capacity. [8] There exist several methods for the objective evaluation of the spinal posture, which can basically be classified into 5 groups namely, radiography, 3D motion analysis via electromagnetic and optical tools, raster stereography, photographic postural analysis and manual methods. Even though X-ray provides clear images of reference points and therefore is a golden standard in the literature, it is not preferred in studies because it involves radiation. 3D motion analysis is valid and reliable but requires costly equipment and lab conditions therefore it is not used frequently. Video raster stereography analysis enables automatic calculation of spinal motion through its multidirectional high resolution video recording. It is reliable but it did not receive a pass in validity studies. Photographic posture analysis may be considered as a basic and observational measurement method using line of gravity, flexible ruler, and posture analysis using palpation. Since this method enables angular calculations, it is a digital and objective method. Clinical use of photographic postural analysis is recommended because it is accurate and objective method. [9] MB ruler (Markus Bader ruler): MB ruler helps to measure distance and angles on the screen and distance on a map, MB ruler gives exact and accurate angle and distance. The reliability of photographic postural analysis is >0.972. [9] It is cost effective, gives accurate angle and has less errors. Early diagnosis of forward head posture will help to minimise the consequences. This study aims to investigate the incidence of forward head posture in adults using laptops using MB ruler software and its association with pain and range of motion of cervical spine. The objective of this study is to find the percentage of forward head posture in laptop users in adults using MB ruler and to find the associated problems of forward head posture in desktop users on Visual Analogue Scale and Cervical Range of Motion.

MATERIALS AND METHODS

MB ruler software version: MB ruler pro, Tripod stand, ECG vacuum cup (to mark the C7 spinous process), Mobile camera (iphone of 15 mpxl.), ihandy Level app, Universal Goniometer, Visual Analogue Scale, Pen / Pencil, and Consent

form were used. The study was a observational study done in community physiotherapy department of Dr. D.Y.Patil college of physiotherapy. Healthy young adults were included who work for >3hrs/day on Desktop since 1 year. Both males and females age group 30-40 years were included in the study. Sampling was purposive and size was 100. Cervical vertebrae fracture, Deformity of spine like scoliosis\kyphosis, Medical condition like vertigo, tumour in cervical region were excluded.

Ethical clearance was obtained from institutional sub-ethical committee of Dr. D. Y. Patil College of physiotherapy. Written informed consent was obtained from subjects. Individuals who had fulfilled the inclusion criteria were included in the study. All the desktop users were taken from Dr. D. Y. Patil College. Participants were informed about the purpose of the study. Procedure for assessment of forward head posture was been explained to them.

- A digital imaging technique was used to evaluate head and neck posture in standing position.
- A mobile (iphone of 15 megapixel) was placed at a distance of 150 cm on a tripod stand and height was adjusted according to the level of the subjects shoulder. ihand level application was used to adjust the camera parallel to the ground
- The subject was asked to stand in front of camera and ECG vacuum cup was placed on participant's C7 spinous process, the participant was asked to face straight and lateral to camera.
- The photo was clicked, and transferred to laptop and then opened in to jpg format with the MB ruler software placing the points of the MB ruler on the photo on C7 spinous process where the ECG vacuum cup was placed.
- The line was drawn from spinous process to tragus of ear and the angle was measured.(measuring of the craniovertebral angle : intersection of a horizontal line passing through C7 spinous process and the line joining the midpoint of the tragus of ear is identified as craniovertebral angle.)
- Smaller the craniovertebral angle more is the forward head posture.
- Visual Analogue Scale was used to record Pain score. Participant marked on the 10cm scale and measurement was taken.
- Universal Goniometer was used for measuring Range of Motion of neck. Flexion, Extension, Side flexion and Rotation was measured.
- Data was collected and inputed on a excel spread sheet the data was analyzed using appropriate test.

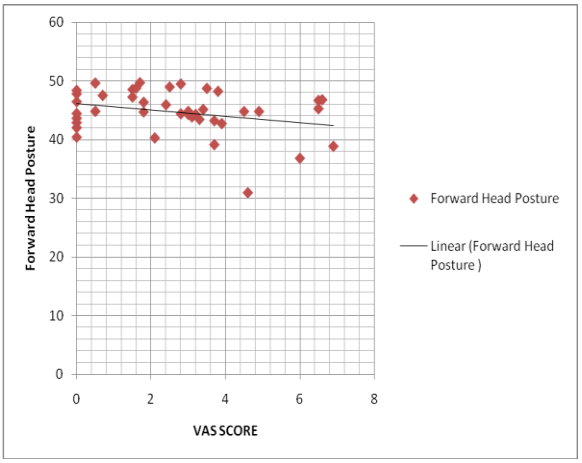
RESULTS

Table 1:

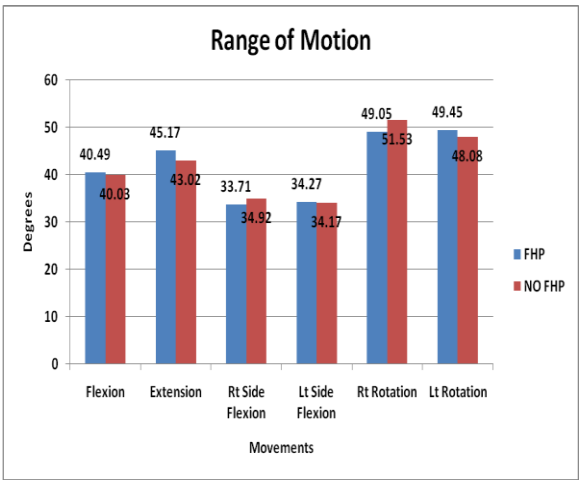
	FHP	No FHP
No. of subjects	41	59

Table 2: Comparison Of various Means

Variable	NO FHP	FHP PRESENT	P Value	Inference
VAS SCORE	2.3 ±2.16	2.64±2.06	0.20	Not Significant
Range of flexion	40.03±11.91	40.49±11.60	0.83	Not Significant
Range of Extension	43.02±12.18	45.17±10.54	0.37	Not Significant
RtLat flexion	34.92±9.49	33.71±9.17	0.53	Not Significant
Lt Lat flexion	34.17±8.49	34.27±8.95	0.75	Not Significant
Rt rotation	51.53±8.33	49.05±8.5	0.2	Not Significant
Lt rotation	48.08±9.28	49.45±9.29	0.38	Not Significant



Graph 2.1:



Graph 2.2:

Interpretation: In the above data the means of Range of Motion and Visual Analogue Scale were compared. Spearman's Correlation Test and Chi Square Test were applied. In all variable the P>0.05 is considered to be not significant. This shows that, Forward Head Posture is not associated with Pain and Cervical Range of Motion.

DISCUSSION

Objective of the study was to find the incidence of Forward Head Posture in desktop users in the age group on 30 of 40 years, who are using desktop more than one year at least for 3-4 hours. Table 2 and Graph 2.1 and 2.2, shows that there is no significant correlation between Forward Head Posture and Pain, & Forward Head Posture and Range Of Motion of Cervical Spine. Studies supporting our results were done by Won-Gyu YOO and Duk-Hyun AN, "The Relationship between the Active Cervical Range of Motion and Changes in Head and Neck Posture after Continuous VDT Work." Active neck extension was negatively correlated with the mean craniocervical angle, and active neck flexion and left lateral flexion were negatively correlated with the mean cervicothoracic angle. [10] In one study of Relationships between sagittal postures of thoracic and cervical spine, presence of neck pain, neck pain severity and disability, the CV Angle was negatively correlated with the presence of neck pain. [11] Won-Gyu Yoo et al in another study "Relationship between Active Cervical Range of Motion and Flexion–Relaxation Ratio in Asymptomatic Computer Workers" have suggested that duration of computer usage of more than 6 hrs per day was highly associated with musculoskeletal Symptoms including the limitation of range of motion. [12] As my subjects were exposed only for 3-4 hours and were taking break in between those hours, hence the result was not significant. As the population selected for the study was young adult group so in the results there was no correlation seen. The study can be done on a large number of populations. Exercises can be given to prevent forward head posture. Ergonomics can be advised before structural changes occur.

CONCLUSION

The study concludes that there is no relation between forward head posture and pain, and forward head posture and range of motion of cervical spine.

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