



Prevalence of Forward Head Posture and its Effect on Active Mouth Opening in Young Female Weightlifters

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Abstract

Background: To objectively assess the prevalence of forward head posture and its effect on active mouth opening. **Material & Methods:** Correlational study design. Setting - Subjects were selected from various gyms and fitness centers located in South Delhi. Subjects were selected for the study according to the following inclusion and exclusion criteria. Method of Sampling- Sample of convenience. Instrumentation / Tools/ Scales/ Outcome Measure- Markers, UTHSCSA Software version 3.0, Calibrated Ruler, Digi Cam; 16 Mega Pixel with stand, Laptop, Liquid Disinfectant, Calibrated Ruler to measure active mouth opening. Craniovertebral angle was measured using UTHSCSA Image tool program. Statistical analysis was done using SPSS 20.0 version software. Descriptive statistics was used to compute means. The Pearson's coefficient of correlation was used to examine the relationships between craniovertebral angle and active mouth opening. Results were considered significant at 'p' < 0.05. **Results:** The purpose of conducting this study was to find out the effect on active mouth opening in female weightlifters which was conducted on females performing weight lifting task in the gyms and fitness centers situated in South Delhi. It was observed that there was a statistically significant correlation with CV angle with active mouth opening. **Conclusion:** By the virtue of this study, we can conclude that our participant group of weightlifters had a below normal craniovertebral angle. The result demonstrated that there is a significant effect on active mouth opening.

Keywords: - Craniovertebral angle, active mouth opening, cervical ROM, neck pain, TMJ mobility, strength training, weightlifting.

INTRODUCTION

Strength training is being used not only in an attempt to excel in the chosen sport but also as an adjunctive modality in the rehabilitation and prevention of injuries.^[1]

The numerous benefits of a solid weight-training program need to be defined, and potential uses have yet to be discovered. As with any other sport, specific injuries occur with

regularity in the weight-lifting sports.^[2] Weight lifting is the only one of these sports currently included in the Olympic Games, although powerlifting (bench press only) is also a part of the Paralympics.

Spinal pain, headache, mood, blood pressure, pulse and lung capacity are among the functions most easily influenced by posture.^[3] One of the most common postural problems is the forward head posture.

Since we live in a forward facing world, the repetitive use of computers, TV, video games, trauma and even backpacks have forced the body to adapt to a forward head posture. It is the repetition of forward head movements combined with poor ergonomic postures and/or trauma that causes the body to adapt to forward head posture.^[4,5]

Forward head posture has been shown to flatten the normal neck curve, resulting in disc compression, damage and early arthritis and many disastrous musculoskeletal outcomes. Forward head position is characterized by an extension of the head together with the upper cervical spine (C1 to C2) accompanied by a flexion of the lower cervical spine (C4 to C7) This posture is associated with weakness in deep cervical short flexor muscles (capital flexors), and mid thoracic scapular retractor (i.e., rhomboids, middle and lower fibers of trapezius) and shortening of the opposing cervical extensor and Pectoralis muscles.^[6,7,8]

The body is connected biomechanically by chains giving an effect of linkages. It is observed that strenuous exercise (weight lifting action) has an effect on teeth also. Clenching action occurs as person lifts a heavy weight, which is natural response of the body. If this action repeated over and again enamel can be worn out so precautions should be taken to avoid such condition.^[9,10]

MATERIAL AND METHODS

Sample Size: A total of 60 female subjects were selected for the study based on inclusion & exclusion criteria.

Source of Study: Subjects were taken from various gyms and fitness centres located in South Delhi area.

Method of Sampling: The subjects were conveniently selected after signing consent according to the inclusion and exclusion criteria

Participation Criteria

Inclusion criteria

- Age group 18-35 years
- Doing regular workout since atleast 1 year
- Willing to sign consent form

Exclusion Criteria

- Systemic and Metabolic Disorder
- Previous history of trauma or pathology to neck/ shoulder or rest of spine.
- Previous history of pathology of Temporomandibular joint.
- Regular tobacco consumers
- Any dental or temporomandibular pain
- Evidences of persistent deformity at foot, ankle, knee, hip or spine.

Study Design

The study design was a correlational study design.

Variables

- Independent: Weight training
- Dependent: Craniovertebral angle and Active mouth opening

Materials Used

- Markers
- UTHSCSA Software version 3.0
- Calibrated Ruler



4. Digi Cam; 16 Mega Pixel with stand
5. Laptop
6. Liquid Disinfectant

Outcome Measures

1. Calibrated Ruler to measure active mouth opening.
2. Craniovertebral angle was measured using UTHSCSA Image tool program.

Procedure

After selection of subjects, an assessment was performed fulfilling the inclusion and exclusion criteria based on which the subjects were selected. The program for each subject was of a single sitting duration. The group comprised of people doing regular workout for at least one hour per day from last one year or more. Before commencement of the program craniovertebral angle of each subject was measured for evaluation of forward head posture. After this, active mouth opening of subjects in each group was evaluated with the help of calibrated ruler.

Measurement of Craniovertebral angle was performed using UTHSCSA software version 3.0 [University of Texas Health Science Centre at San Antonio]. For evaluation of Craniovertebral angle, a marker was placed over the spinous process of C7 vertebra which was visible from the sagittal plane. A still picture was taken in this position. Now, a line was drawn joining spinous process of C7 vertebra & tragus of the same ear. The angle made by this line with horizontal, was considered as Craniovertebral angle. Craniovertebral angle in abnormal limits leads to forward head posture.

Maximum active mouth opening was assessed with subjects in sitting. Subjects were asked to “open the mouth as wide as possible without causing any stress at the jaw”. At the end position of the maximum active mouth opening, the distance between upper & lower central incisors (base) was taken in millimeters by a calibrated ruler. The mean of 3 trials was taken for the main analysis.

Statistical Analysis

Statistical analysis was done using SPSS 20.0 version software. Descriptive statistics was used to compute means. The Pearson’s coefficient of correlation was used to examine the relationships between craniovertebral angle and active mouth opening. Results were considered significant at ‘p’ < 0.05.

RESULTS

The purpose of conducting this study was to find out the effect on active mouth opening in female weightlifters which was conducted on females performing weight lifting task in the gyms and fitness centers situated in South Delhi. It was observed that there was a statistically significant correlation with CV angle with active mouth opening.

DISCUSSION

The present study was conducted to evaluate forward head posture of weightlifters and evaluate the effect on active mouth opening.

Within the group comparison of craniovertebral angle has shown a statistically significant decrease ($p=0.0001$). By this it can be concluded that participants have reduced craniovertebral angle than the normal values.



While lifting heavy weights, people lean forward in order to have more leverage which significantly increases neck flexion angles. Increased flexion in thoracic spine also contributed to the increased forward postures that participants assume.^[6]

And this has been an evident fact that patients with small craniovertebral angles have a greater forward head posture, the greater the disability.^[7]

Humans achieve their full mouth opening by extending their neck by 26° from neutral position. Patients with reduced cranio cervical mobility have reduced mouth opening.^[8]

Limitation of the Research

1. Comprehensive assessment due to limitation of time at the source of data generation.
2. Lack of time for research.

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3. Sample of convenience.

Future Prospects

1. Objective analysis of electrical activity of muscles involved in forward head posture and mouth opening can be done.
2. Comparison can be made between different groups of population.
3. Comparison can be made between males and females for craniovertebral angles and active mouth opening.

CONCLUSIONS

By the virtue of this study, we can conclude that our participant group of weightlifters had a below normal craniovertebral angle. The result demonstrated that there is a significant effect on active mouth opening.

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