

Comparative Study of Pettibon’s Anterior Head Weighting System and Conventional Management for Deep Cervical Flexor Muscle Endurance in Forward Head Postured Young Adults



Medical Science

KEYWORDS : Forward head posture, cervical lordosis, deep cervical flexor muscles, Pettibon anterior head weighting system.

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ABSTRACT

Postural problems are going to become a global threat and static posturing in day to day life is causing novel health problems. A total of 30 male and female subjects of age group 20 to 30 years with Forward head posture underwent the intervention. subjects were assigned on the basis of sample of convenience and randomly allocated into two groups- Experimental group: receiving application of Anterior head weighting with treadmill walking and conventional group: receiving conventional stretching and strengthening exercise to specific muscles. Intergroup comparison showed statistically significant difference in forward head posture and deep cervical flexor muscle endurance (p<0.01). Pettibon’s anterior head weighting system is more effective in improving forward head posture and deep cervical flexor muscles endurance as compared to conventional protocol in young adults.

INTRODUCTION

Globally many researchers show a strong correlation between sedentary workers, postural deviations and neck complaints found in them.¹⁻³ Postural abnormalities (eg. forward head posture) associated with pain complaints were found prevalent in healthy adults between the ages of 20-50 years.³ There is significant correlation between forward head posture and neck pain, cervicogenic headache, interscapular pain⁴ as well as cranial or Craniomandibular dysfunction.⁴⁻⁶

Muscles respond to dysfunction in one of the two ways, either by becoming overactive or by becoming inhibited and weak. Vladimir Janda has described a predictable model of shortening (facilitation) and weakness (inhibition) of muscles groups due to postural positioning in sedentary environment and repetitive work task. This pattern in occipito-cervical-thoracic region is named by him as proximal or upper crossed syndrome

Based on this model only the conventional method of forward head posture correction has been designed which includes stretching of the shortened muscles i.e. Sub Occipital Muscles, SCM, Levator Scapulae, P. Major, P. Minor, Scalinii etc. and strengthening of the weak lengthened muscles i.e. Multifidi, Deep Cervical Flexors, Mid and Lower Trapezius, Serratus Anterior etc. While this is a proven treatment, there is lack of sufficient literature supporting its effect in radiographic improvements in posture. And on the other hand this method is supposed to be nonphysiologic as the muscles are trained voluntarily and separately in different antigravity positions, which may improve their individual function but their reflexive coordinated function is yet questionable. Even about how long the beneficial effects last is not yet defined.

For the reason above it is felt necessary now to develop a more sophisticated system of spinal correction which enables the therapist and the patient to comply more easily and which can cause a better improvement in context with reflexive training, time consumption, complexity, and finally results obtained from which are more sustainable.

On the basis of above concept revolutionary study of Saunders et al.⁷ showed the effect of anterior head weighting on cervical lordosis and forward head posture. After that Morningstar et al conducted a pilot study on the same concept and presented a few case studies of the patients benefitted by the Pettibon head weighting system.⁸⁻⁹ Morningstar et al has also demonstrated successful treatment of scoliosis with the help of spinal manipulation and Pettibon head weighting system.⁹ As it is evident that there is lack of proper randomized clinical trials on the efficacy of Pettibon head weighting system, this study is an effort to measure the comparative effectiveness of Pettibon head weight-

ing system (HWS) over conventional treatment and also it will help to standardize the protocol to some extent for the effective use of the invention.

METHODOLOGY

A total number of 30 male and female of age group 20-30 were taken in the study. A sample of convenience has been taken. Included subjects were with evident forward head posture and/or cervical hypolordosis who could maintain the corrected neck

posture at least for more than 5 seconds. Patient flow during the study is depicted in the figure 1.

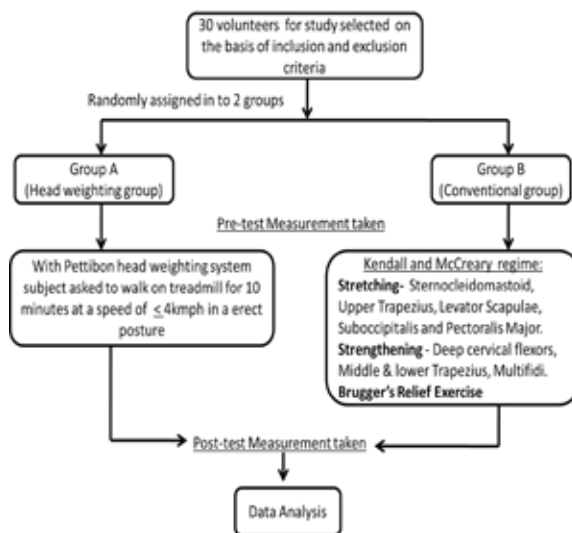


Figure 1. Subject flow in the study

Measurement of DCFM endurance(DCFME)

The method to measure endurance of the DCFM was designed and used by Watson⁴. The subject was made to lie supine with hip and knee in 90-90° position and arms crossed over chest to minimize any substitution. A towel roll was also placed under the lumbar curvature if required. Now the subject was asked to flex the head on neck and keep the head lifted from the plinth as long as he could. Care was taken to avoid contraction of SCM. First reading is discarded and after that three readings with a rest period of 60 sec are taken and best of these three is recorded.

Screening of forward head posture (FHP):

Forward head posture was assessed in a relaxed standing position without shoes. To attend natural head posture the "self balance position" was used which has been described and used by Goldstein et al.¹⁰, and Watson⁴.

This self balance position is achieved by subject performing large amplitude cervical flexion-extension, gradually decreasing to rest in the most comfortably balanced position.

A small plumb line is hanged through the tragus of the ear. If it fell anterior to the midpoint of acromian process, subject was said to be having forward head posture. If it fell anterior to medial end of clavicle, forward head posture was profound.

Marking System**For Forward Head Posture:**

As the standard lateral cervical radiograph was obtained, the accurate hard palate line was erected on it. For the position of the head to be accurately neutral, the palate line should be 90° plus or minus 2° from the edge of the X-ray. Now a vertical line of gravity was drawn (perpendicular to the palate line) passing through the anterior margin of sella turcica (assumed centre of gravity of skull) extending up to the bottom of film. Normally in the correct head posture this line passes through the anterior portion of the C4-C5 disc. If it was anterior to it, forward head posture was taken to be evident. Perpendicular distance of the LOG from anterior border of C4-C5 is measured in millimeters and recorded. (Normal distance= 00 mm)

RESULTS

The mean values of Age, Height, Weight and BMI mentioned in table 1 indicate that there was no statistically significant difference between Group A & B. This shows that both groups were homogenous and fairly comparable.

Table 1: Demographic profile of subjects (mean+SD)

	Group A	Group B	Independent t- test
Age	24.20 ± 1.14	23.83 ± 2.03	0.557 (NS)
Height	171.66 ± 8.67	170.75 ± 8.40	0.278(NS)
Weight	65.06 ± 11.42	66.25 ± 11.77	-0.263(NS)
BMI	22.05 ± 2.82	22.50 ± 2.73	-0.423(NS)

The values of baseline forward head posture (in mms) and deep cervical flexor muscle endurance (in seconds) indicate that there was no statistically significant difference between Group A & B. This shows that both groups were homogenous and fairly comparable.

Deep Cervical Flexor Muscle Endurance (DCFME)

Comparison of means of Post intervention DCFME values for both groups A (82.23 ± 28.71) and B (73.95 ± 34.31) show a highly significant difference between groups (p=0.002). Deep Cervical Flexor Muscle Endurance showed significant mean change of 44.64 ± 14.34 and 21.51 ± 18.55 for group A and B respectively as depicted in table 2.

Forward Head Posture

Comparison of mean change in Forward Head Posture of both the groups A (43.35 ± 23.56) and B (11.0± 20.24) showed a highly significant difference (p≤ 0.01) between two groups as shown in the table 2.

Table 2: Inter-group comparison of FHP and DCFME. (mean+SD)

FHP	DCFME		
	Group A	Group B	Paired t-test
Post test	82.23 ± 28.71	73.95 ± 34.31	0.669 (NS)
Mean change	44.64 ± 14.34	21.51 ± 18.55	3.552**

Note: ** p≤0.01, NS non-significant

DISCUSSION

The results of the present study are encouraging and showed a significant difference in management of deep cervical muscle endurance by pettibon HWS in contrast to conventional methods of treatments. One remarkable observation is that all fifteen subjects from experimental group have shown positive improvements in FHP after treatment but the case is not same with conventional group. Deep cervical flexor muscle endurance was included in the study with an objective to assess the effect of both protocols in increasing the endurance of the cervical flexors. Increased endurance of the cervical flexors may be helpful in sustaining normal head posture for longer periods of time.

CONCLUSION

This study provides important information about effect of two different treatment techniques of posture correction in young adults. Furthermore conclusion of the study will be helpful in designing a holistic approach for posture correction and prevention of posture induced ailments in future.

REFERENCE

- Morningstar MW. Reflex control of the spine and posture: a review of the literature from a chiropractic perspective. Chiropractic and osteopathy.2005(13)16. | 2. Grob D. The association between cervical spine curvature and neck pain. Eur Spine J 2007 (16), 669-678. | 3. Griegel Morris P. Incidence of common postural abnormalities in the cervical, shoulder and thoracic regions and their association with pain in two age groups of healthy subjects, Phy Ther. 1992 (72), 425-431. | 4. Watson DH. Cervical headache : an investigation of natural head posture and upper cervical flexor muscle performance. Cephalalgia. 1993(13), 272-284. | 5. Gelb H, Bernstein I. Clinical evaluation of 200 patients with temporomandibular joint syndrome. Journal of prosthetic dentistry.1983 (2), 234-243. | 6. Mannheimer JS, Rosenthal RM. Acute and Chronic Postural abnormalities as related to craniofacial pain and temporomandibular disorders. Dental clinics of North America.1991(1),185-208. | 7. Saunders ES. Improvement in cervical Lordosis and reduction of forward head posture with anterior head weighting and proprioceptive balancing protocols. J Vertebral Subluxation Res.2003,1-5. | 8. Morningstar MW.Spinal manipulation and anterior head weighting for the correction of forward head posture and cervical hypolordosis :A pilot study.Chiropractic Medicine. 2003 (2), 51-54. | 9. Morningstar MW. Cervical curve restoration and forward head posture reduction for the treatment of mechanical thoracic pain using Pettibon corrective and rehabilitative procedures.J Chiropr Med. 2002 (1), 113-115. | 10. Goldstein MB. Influence of cervical posture in mendibular movements; J Prosth Dent. 1998 (52), 421-426. |