



ORIGINAL RESEARCH PAPER

Anatomy

EFFECTIVENESS OF ISOMETRIC STRENGTH TRAINING & ISOTONIC EXERCISE ON PAIN & DISABILITY IN CHRONIC NECK PAIN

KEY WORDS: Isometric, isotonic, chronic neck pain

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ABSTRACT

Many studies have been conducted on strength and isotonic exercise individually and their results have shown that there is a significant improvement in pain and disability, but the combination of both isometric and strength exercises for chronic neck pain has not been thoroughly investigated. Therefore the study aims at deducing the effect of strength and isotonic exercise in patients with chronic neck pain

INTRODUCTION

Neck pain is a common problem in sports and in society mechanical neck pain may be defined as pain secondary to overuse of a normal anatomical structure or pain secondary to injury or deformity of an anatomic structure.¹ Neck pain is considered to be chronic if it last for more than 3 month of duration pain that continues after the stimulus is removed and after the tissue damage heals. Chronic neck pain is becoming increasingly prevalent in society.

Estimations indicated that 67% of individuals will suffer neck pain in Bangalore has been estimated as 35% and the median age as 27 years and it ranges between 18 to 52 years.² Throughout the world wherever statistic are available, neck pain is increasingly reported as a problem.

Epidemiological surveys show that 45-71% of people recall an episode of neck pain that affected their activities of daily living. At any given time 9% of men 12% of women have neck complaints. In some industries neck complains are even more frequent than back problems. There is a strong evidence for the efficacy of exercise based intervention in reducing pain and improving function among chronic neck pain patients.³

Pain in the neck and its associated complication is a regular feature to any sports of orthopedic clinic. The cause and pathology of neck pain are complicated. However the major contributory factor is bad postural habits.

ANATOMY

The cervical spine is made up of first seven vertebrae in the spine. There are special openings in each vertebra for the arteries that carry blood to the brain.



Figure 1: cervical spine

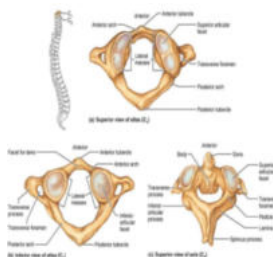


FIGURE 2 Cervical vertebrae

(Courtesy: Seeley textbook of Anatomy and Physiology) Each vertebra is the shaped in a special way so that when they are stacked together, spinal cord is protected from damage or injury by the bones of the entire spinal column. Vertebrae support the majority of the weight imposed on the spine. The body of each vertebra is attached to a bony ring that consists of several parts.⁷

A bony projection on either side of the vertebral body called the pedicle supports the arch that protects the Spinal canal. The laminae are the parts of the vertebrae that form the back of the bony arch that surrounds and covers the spinal canal. There is a transverse process on either side of the arch where some of the muscle of the spinal column attaches to the vertebrae. The spinous process is the bony portion of the vertebral body that can be felt as a series of prominence in the centre of the person's neck and back.

METHODOLOGY

SOURCE OF DATA:

Subjects were selected from the chronic cervical pain population group satisfying the inclusion criteria from Swayam Prabha Institute of Paramedical Technology Jabalpur (Seth Mannulal Jagganath Das Trust Hospital Jabalpur).

STUDY DESIGN:

Experimental design pre and post test comparison.

SAMPLE SIZE: 30 subjects (15 in each group)

SAMPLE METHOD: Simple random sampling method

SELECTION CRITERIA

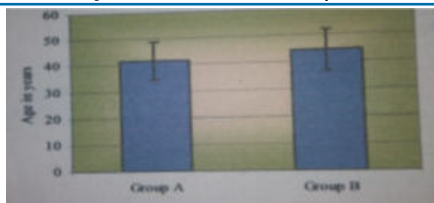
Inclusion criteria

- Age: 20-45 years
- Gender: both male and female
- Chronic neck pain (of various intensity of pain) that had lasted more than three months.

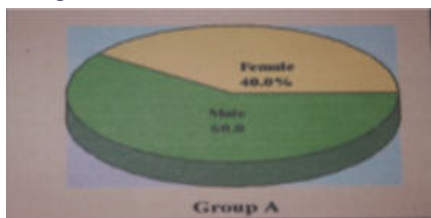
RESULTS

Table 1 : Basic characteristics of the study

Basic characteristics	Group A	Group B	Remarks
Number of subjects	15	15	-
Age in years (Mean ± SD)	41.43 ± 7.02	44.33 ± 7.89	Sample are age matched with P=0.348
Sex Male Female	9(60%)	7(46.7%)	Sample are sex matched with P=0.464
	6(40%)	8(53.3%)	



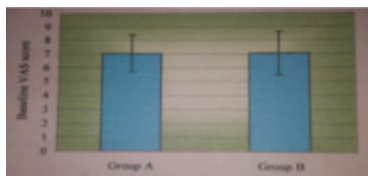
Graph 1a: Age distribution



Graph 1b: Sex distribution

Table 2: Comparison of Baseline parameters between two groups

Baseline parameters	Group A	Group B	Remarks
VAS	7.07±1.34 (5-9)	7.07±1.58 (5-10)	VAS is statistically similar between two group with P=0.999
NDI	22.20±9.00 (8-32)	21.27±9.46 (7-39)	NDI is statically similar between two with P=0.784



Graph 2a: Baseline value of VAS

DATA ANALYSIS

Simple random sampling was adopted in the study. A group of 30 patients with chronic neck pain between ages 25-55 years were selected for the study.

There were 16 male and female patients, who were divided into two group. There were 7 males and 8 females in experimental group (isometric and isotonic exercises) with mean age of 44.33 and SD of 7.89. In the control group (Isometric exercise) there were 7 male and 8 females with mean age of 41.73 and SD of 7.02.

The two groups were compared using VAS for pain and NDI for disability. Pre and post values between the groups was compared using student t-test (two tailed and independent) Student t-test paired has been used to find the significance of VAS and NDI between pre intervention and post intervention for each group.

The analysis was made to find out if isometric and isotonic and isotonic exercises were more effective than treatment with isometric exercise only as measured by a decrease in pain score and a decrease in the neck disability index scores.

CONCLUSIONS

The study shows that the treatment with Isometric and isotonic exercise produces improvements in patients with chronic neck pain and contributes to significant variations in the outcome measures of the patients.

There is a significant effect of Isometric and Isotonic exercises in the management of chronic neck pain patients and there is a significant difference in the reduction of pain threshold (VAS) and disability score (NDI) as compared to patients treated with isometric exercise alone..

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