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"An Immediate Effect of Physiotherapy intervention on PEFR in patients with chronic mechanical upper back pain"

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Abstract:

Back pain and neck pain are extremely common musculoskeletal problems in communities. Untreated spine problems may lead to long-term disability. Difference in maximum inspiratory and expiratory pressures was reported in patients with chronic neck pain and back pain compared to asymptomatic subjects. 30 patients with chronic mechanical back ache were treated with TENS, hot pack and exercises shows statistical improvement in PEFR and thus in pulmonary functions of patients. The study concludes that physiotherapy intervention is effective on PEFR in patients with chronic mechanical upper back ache. Limitations of the study were small sample size and Unable to take pulmonary function test for specific correlation between musculoskeletal condition and lung function.

Index Terms: Upper back pain, TENS, hot pack and PEFR

INTRODUCTION:

The thorax, consisting of the thoracic vertebrae, the ribs, and the sternum, has several important functions. The thorax provides a base for the attachment of muscles of the upper extremities, the head and neck, the vertebral column, and the pelvis[1]. The most important function of the chest wall is its role in ventilation. The process of ventilation depends on the mobility of the bony ribs and the ability of the muscles of ventilation to move it. Muscles for neck and upper back mobility are directly attached to thoracic wall. Any pain or movement restriction in neck or upper back affects ventilator functions especially.

Back and neck pain are extremely common musculoskeletal problems in industrialized communities. Untreated spine problems may lead to long-term disability, e.g. 5–15% of low back pain patients having disability according to the chronicity of the problem.[2]

Considering pain alone, pain with nerve root irritation, muscle spasm and strain origin may lead to reduced lung volume and chest wall compliance. Although specific respiratory function test is not routinely included in the assessment and treatment of patients with neck and back pain, one cannot disregard that adding respiratory function measurements may give additional valuable information on the effect of physical therapy interventions.[2]

The rehabilitation programs are focused in reduction of pain, improving flexibility of soft tissues, segmental mobility, strength and endurance of muscles, correcting postural alignment and education of body mechanics [2]. There are few studies available related with the effect of chronic pain on respiratory muscle function and thoracic expansion.[2]

Significant difference in maximum inspiratory and expiratory pressures was reported in patients with chronic neck pain compared to asymptomatic subjects[3]. Muscle strength and endurance, cervical range of motion, and psychological states were found to be significantly correlated with respiratory parameters [3]

The reduction in pain effects the PEFR in patients with neck and back pain was not studied at all. So, present study aims to evaluate the effect of physiotherapy intervention on PEFR in patient having mechanical upper back ache.

Need of study:

- Patient with mechanical upper back ache are prone to have reduced chest mobility and thus to have reduction in pulmonary functions E.g. PEFR
- So to see "whether the physiotherapy management for upper back ache can lead to improvement in chest mobility and so in PEFR" this study has been under taken.

Objectives:

- To see the effect of upper back pain on PEFR.
- To study the effect of physiotherapy management on PEFR.

METHODOLOGY:

- Study design : an experimental study
- Study population : 30 patients with mechanical upper back ache

Inclusion criteria:

- Mechanical upper back ache more than a month,
- Age between 20 to 40 years,
- Decreased PEFR

Exclusion criteria:

- Any neurological condition,
- Any other musculoskeletal condition of thorax,
- Any cardio-pulmonary condition,
- Non co-operative patients

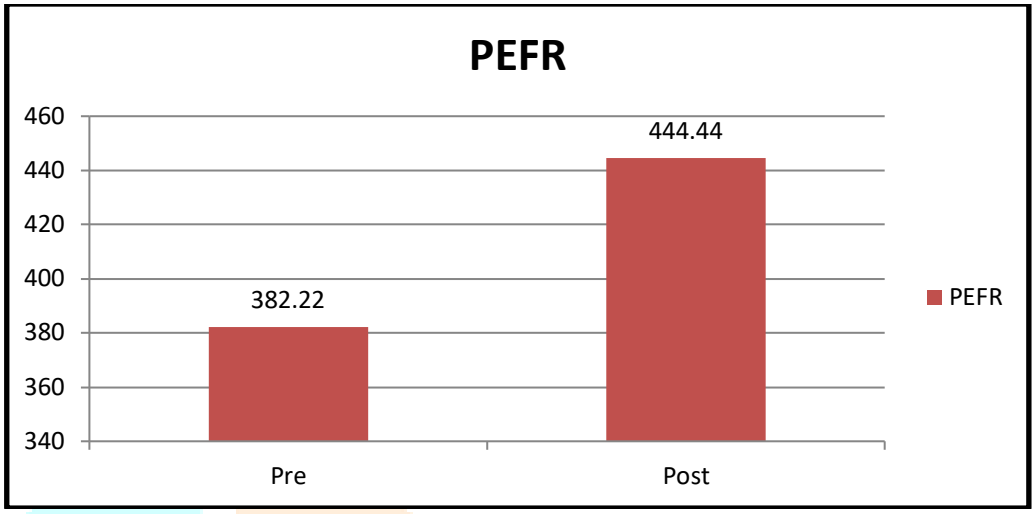
Procedure:

- 30 patients with chronic mechanical back ache were randomly selected according to inclusion criteria.
- Written consent was taken of every person who participated in the study.
- Outcome measure was taken before and immediately after the physiotherapy intervention.
- Combination of TENS, Hot Pack and exercise were given.
- TENS[4]
    - Frequency : low frequency tens
    - Time : 10 minutes
    - Intensity : according to patients tolerance
- After TENS and hot pack was given for 10 minutes.
- Exercises were given according to the tailor made protocol.
- No chest expansion and breathing exercises were given to any patients.

RESULT:

Analysis of data was done with SPSS version 20 and Microsoft excel.

Pre and Post paired sample t-test was applied which shows statistical significant p-value (0.018) of PEFR.



Graph-1 Comparison of Pre and Post PEFR

- Study shows clinical and statistical significant improvement on PEFR.
- So it rejects the null hypothesis.

DISCUSSION:

- 30 patients of mechanical upper back ache were treated with TENS, hot pack and exercises (according to tailor made protocol).
- In present study they had decreased pain along with improved PEFR.
- PEFR were selected as outcome measure to check relation between pain and musculoskeletal condition of thorax with the pulmonary functions.
- Pain reduction was due to effect of low frequency TENS and hot pack.
- Low frequency TENS causes release of natural pain relieving hormones(endorphin) and blocks other pathways.
- Hot pack reduces muscle spam and improves blood circulation.[10]
- One study on PEFR and chest expansion on the patients with neck and back pain done by Nihal Gelecek et al (2006) shows results that physiotherapy intervention aimed to reduce pain also shows positive effect on pulmonary functions.

CONCLUSION:

- The study concludes that physiotherapy intervention is effective on PEFR in patients with chronic mechanical upper back ache.

Limitations:

- Small sample size.
- Unable to take pulmonary function test for specific correlation between musculoskeletal condition and lung function.

Future studies:

- Effect of long term intervention on PEFR in patients with mechanical upper back ache.
- Effect of other modalities on pulmonary function in patients with Upper back ache.
- Pulmonary function test can be done to check specific correlation.

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