International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2020): 7.803

Correlation Study between Non-Specific Low Back Pain and Back Extensor Endurance in Peons

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Abstract: ***Background and Purpose: In India 60% of the suffering from low back pain are engaged in physically demanding and prolonged standing jobs out of which only 15% have specific diagnosis. Peons are important part of office, college labour work with average standing time for a college peon is 4-8hours which make them prone to lower trunk extensor endurance. Thus the aim of the study is to find the co-relation between back extensor endurance and non specific low back pain. Methods: A study of total 30 participants was carried out amongst randomly selected peons working in college, after fulfillment of inclusion and exclusion criteria. NPRS (Numerical Pain Rating Scale) was used to asses pain and Biering-Sorenson test was used to asses muscle endurance of back extensors. Result: Most prevalent that is, 60% of the participants have moderate intensity of pain, that is more than half of samples taken.23% suffer from severe intensity pain and 17% suffer mild pain.33% of the population has hold time 31-60 sec.27% of the population has 91 to 120 sec and 20% have 61-90 sec 13% have 0-30 sec and 7% have hold time between 120 to 150 sec. The participants having with least pain has highest holding time and participant having pain more than 6 have the least hold time.***

Keywords: Back extensors Endurance, Non-Specific Low Back Pain, Prolonged Standing, Peons.

1. Introduction

In India 60% of the people a have suffered from low back pain at some time during their lifespan, out of which most of the low-income group people are engaged in physically demanding jobs which may increase the risk of low back pain and disability. Nonspecific low back pain is prevalent in 84% of this population 23% out of them have chronic low back pain.1

Intermittent LBP is seen in 40-70% of individuals with prolonged standing jobs example drivers, construction workers, health care providers, office workers, manual labourers, dentists, warehouse and automechanics. These individuals may be considered a preclinical group who are at increased risk of future LBP disorders. it has been reported that working in a standing posture on a regular basis can cause sore feet, swelling of the legs, varicose veins, muscular fatigue, and low back pain. Prolonged standing effectively reduces the blood supply to the muscles resulting in the acceleration of the onset of fatigue and causes pain in the muscles of the legs, back and neck.[2]

Muscle endurance is the ability of a muscle to contract repeatedly against an external load, generate and sustained attention and resist fatigue over extended period of time.3Endurance of postural muscles is required for maintenance of proper balance and body alignment. Poor endurance of trunk muscles induces stress on the structures of the lumbar spine, there is evidence which tells that the patients with chronic low back pain have lower trunk endurance than population without low back pain.4

The Biering-Sorenson test is described as to test of the isometric endurance of the hip and back extensor muscle. study showed that by Biering-Sorenson, it was found to be a good assessment tool for predicting the risk of non-specific low back pain The test consists in measuring the amount of time a person can hold the unsupported upper body in a horizontal prone position with the lower body fixed to the examining table.

Peons are important part of office, college labour work in India Average standing time for a college peon is 4-8hours. They perform duties like carry heavy file boxes, move chairs and benches from one room to another, cleaning the classroom, they distribute files inside and outside department, they attend any other official work entrusted by the Head Typist, staff and administration department. Their day-to-day activities include a lot of forward bending, twisting, turning and heavy lifting.

2. Literature Survey

Study was conducted in TMV Physiotherapy OPD, other rehabilitation center.

TARGET POPULATION was working Peons in Tilak Maharashtra Vidyapeeth. Peons were screened based on their postures attained during work and also as per the presence of pain and other discomforts. This study was taken to find out the prevalence of Musculoskeletal Discomfort in this population owing to the long hours of attainment of faulty postures also poor maintenance of vehicles and others to fulfill their professional demands.

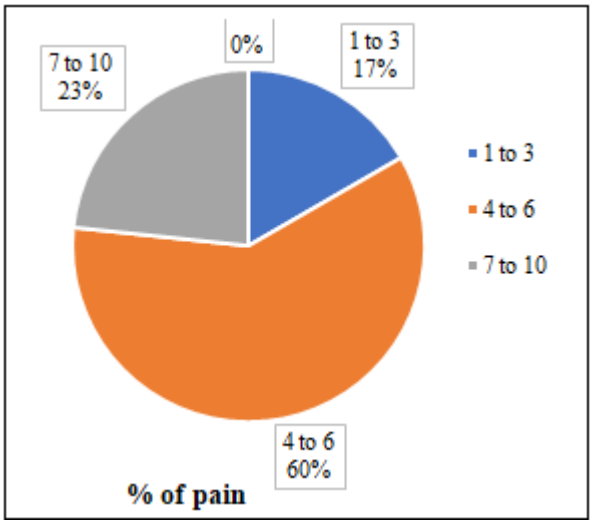
3. Method

- Different institutes were approached and permission was obtained prior to the study.
- The study procedure and aim of the study was explained to the participant.
- 30 participants were selected according to inclusion and exclusion criteria.

Inclusion criteria:
- Nonspecific pain
- Subacute pain
- Male population
- Age group-(20-45)

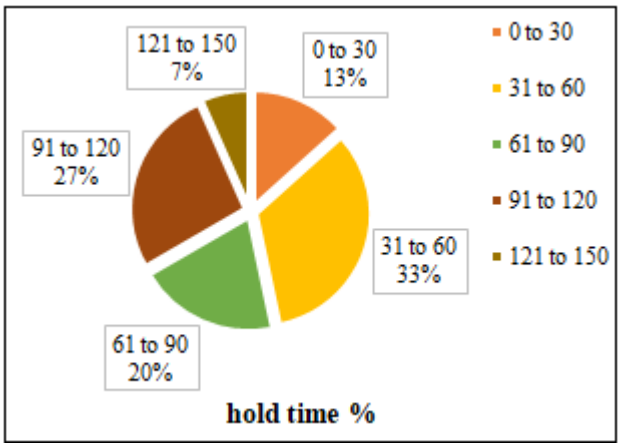
Exclusion criteria:
- LBP due to any other pathology (Spondylolysthesis, pivd, lumbar canal stenosis)
- Subjects suffering from cardiac and pulmonary diseases
- Patients with neurological disorders
- Spinal deformities

4. Results



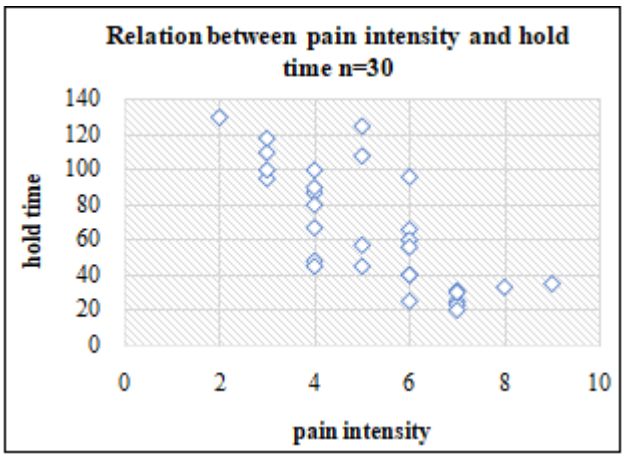
Graph 1: % of pain distribution

Interpretation 1: graph represents that 60% of the samples have moderate intensity of pain, that is more than half of samples taken.23% suffer from severe intensity pain and 17% suffer mild pain.



Graph 2: % hold time distribution

Interpretation 2: the graph represents 33% of the population has hold time 31-60 sec.27% of the population has 91 to 120 sec and 20% have 61-90 sec 13% have 0-30 sec and 7% have hold time between 120 to 150 sec.



Graph 3: Relation between pain intensity and hold time

Interpretation 3: Graph shows participants having with least pain has highest holding time and participant having pain more than 6 have the least hold time.

5. Discussion

This study was carried out to find the correlation between low back pain and back extensor endurance in college peons. In the present study 30 male peons between age 20-45 years having subacute non-specific low back pain were included. The intensity of pain was assessed using NPRS scale and back extensor endurance was assessed using Biering-Sorenson test.

According graph 2 of age distribution, highest percentage of peons suffering from non-specific low back pain are in age group 41-45 years and least percentage is seen in age group 20-30 years. Older age group may have degenerative changes and peons in this age group have been in the same profession for more number years which increases their chances of developing work-related musculoskeletal disorders.

According graph 1 of pain percentage, 60% of peons have moderate intensity of pain, as they have longer working

hours that means longer duration of standing. Recent studies have been conducted examining the relationship between these health outcomes and the amount of time spent standing while on the job. A number of low back pain (LBP) measures have been associated with prolonged standing. By far the most measured outcome is low back fatigue and discomfort. Their day-to-day activities include lot of back bending, twisting and heavy lifting activities are involved which increases the intensity of pain.

According graph 3 of hold time percentage, 33% have 31-60 sec hold time which is less than the Biering-Sorensen and Holmstrom mean position-holding time for patients with low back pain individual ranges from 171s and 137.5 s, respectively. It is known that long standing professions have lower endurance of back extensors. The results of study using electromyography (EMG) recordings, showed higher co-activation in long standing work individuals. The results indicated that endurance and co-activation were affected by prolonged standing and increase in pain ratio. The majority of peons have lesser endurance than optimum because of same reason.7

According to graph 4, relationship between hold time and pain intensity shows that individual with highest hold time (endurance) which is 130s has least pain intensity which is 2. Greater muscle endurance reduces the chances of developing pain as greater endurance can sustain higher intensity of work load and standing hours. The peons suffering from severe intensity pain have lower hold time. This shows that pain intensity and endurance are inversely proportional to one another. It is seen that there are biomechanical changes in patients doing prolonged standing individual leading to low back pain, 40% individual suffer from it, decrease in vertebral joint rotation while lateral bending, the postural stability center of pressure excursion is increased especially in males.8Rate of muscle fatigue is increased in workers due to dynamic and static standing. Prolonged standing may result in decreases in balance reactions during narrow base conditions as well as in the capacity to effectively resist side-loads at the trunk. Its seen that after 30 minutes of prolonged standing there is increased sway, less postural control which is indicator of muscle fatigue.7

There is significant difference in hold time of individual with mild and severe pain as the pain rate is high the hold time as reduced, shows that muscle fatigue in induced faster in individuals with more pain. However, the hold time of individual having moderate intensity has lesser significant difference in hold time compared to the individual with mild pain. this can be as sample included have subacute pain which increases the chances of performing the test with better hold time. Subacute pain is defined as pain that presents for less than three months, or as pain duration of one to two months, or pain of duration of six to 12 weeks.1[2] Samples may have been doing treatment for the pain like hot fomentation, exercises which is reason for lesser significant difference in endurance of muscles for people mild to moderate pain. The reason being pain distribution in prolonged standing individual shows marked difference in individual taken exercise program and the ones with untreated low back pain. Exercise program may have included strength-endurance training which resulted in increased hold time in such individuals.9

6. Conclusion

The study performed shows that there is negative correlation between non-specific low back pain and endurance of back muscle extensors in college peons as the result are hold time of Biering-Sorenson test and pain intensity according to NPRS is inversely proportional.

7. Future Scope

- Study can be done with large sample size.
- Study was only done in male population, comparison study can be done in male and female
- Study can be done correlation of exercising, endurance and low back pain
- Intervention based study can be done to see effect of endurance training on low back pain

References

[1] Ahdhi GS, Subramanian R, Saya GK, Yamuna TV. Prevalence of low back pain and its relation to quality of life and disability among women in rural area of Puducherry, India. Indian Journal of Pain.2016 May 1; 30 (2): 111.
[2] Denis S, Shannon HS, Wessel J, Stratford P, Weller I. Association of low back pain, impairment, disability & work limitations in nurses. Journal of occupational rehabilitation.2007 Jun 1; 17 (2): 213-26.
[3] Nelson-Wong E, Callaghan JP. Transient low back pain development during standing predicts future clinical low back pain in previously asymptomatic individuals. Spine.2014 Mar 15; 39 (6): E379-83.
[4] AMERICAN college of sports medicine: ACSM guideline for exercise testing and prescription ed9
[5] Holmström E, Moritz U, Andersson M. Trunk muscle strength and back muscle endurance in construction workers with and without low back disorders. Scandinavian journal of rehabilitation medicine.1992 Jan 1; 24 (1): 3-10.
[6] Mustapha Z, Aigbavboa C, Thwala DW. HEALTH RISK MANAGEMENT IN THE CONSTRUCTION INDUSTRY.
[7] Waters TR, Dick RB. Evidence of health risks associated with prolonged standing at work and intervention effectiveness. Rehabilitation Nursing.2015 May; 40 (3): 148-65.
[8] Nelson-Wong E, Callaghan JP. Changes in muscle activation patterns and subjective low back pain ratings during prolonged standing in response to an exercise intervention. Journal of Electromyography and Kinesiology.2010 Dec 1; 20 (6): 1125-33.
[9] Bussieres AE, Stewart G, Al-Zoubi F, Decina P, Descarreaux M, Hayden J, Hendrickson B, Hincapie C, Page I, Passmore S, Srbely J. The treatment of neck pain–associated disorders and whiplash-associated disorders: a clinical practice guideline. Journal of manipulative and physiological therapeutics.2016 Oct 1; 39 (8): 523-64.