



PREVALENCE OF SUPRASPINATUS IMPINGEMENT IN PAINTERS.

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ABSTRACT

Background : Musculoskeletal disorders is a natural health problem in the working population. The total global prevalence of musculoskeletal disorders in shoulders is 55.63%. There is a major risk of development of upper extremity musculoskeletal disorders in painters. Painters are engaged in a profession where they have to do repetitive overhead activity above 90 degrees; This impairs the blood supply to the rotator cuff muscles and may be one determinant of rotator cuff impingement working with the hands at or above shoulder level.

Aim : To find out the prevalence of supraspinatus impingement in Painters.

Objectives : To assess the shoulder pain in painters using Visual Analogue Scale. To find out the prevalence of supraspinatus impingement in painters using a Hawkins – Kennedy Impingement Test.

Methodology : There were 85 subjects taken age range between 26 – 40 years. The duration of the study was of 6 months. As per inclusion criteria subjects had more than 1 year of working experience and working more than 6 hours a day. Subjects were given Visual Analogue Scale and the intensity of pain was marked by them on the scale. Special test like Hawkins – Kennedy Impingement for testing supraspinatus impingement was performed.

Results : 58% were seen positive for Hawkins – Kennedy test.

Conclusion : There is 58% prevalence of supraspinatus impingement in painters.

Keywords : Supraspinatus Impingement , Visual Analogue Scale , Hawkins – Kennedy Impingement Test , Painters.

INTRODUCTION

Painting is a profession where painters are engaged in repetitive overhead activity above 90 degrees arm elevation.⁽¹⁾ Musculoskeletal disorders is a natural health problem in the working population.⁽¹⁾ The relationship between disorders and work related factors has been reviewed by several authors.⁽²⁾ Nerves, tendons, muscles and supporting structures are involve in musculoskeletal disorders.⁽³⁾ the major cause of morbidity in the working population are musculoskeletal problems internationally ,and estimated 40% of all injury are due to musculoskeletal disorders at the work place. Increased physical work load on the individual while working is due to work related musculoskeletal disorders this constitutes majorly in employed disability and lost wages.⁽⁴⁾

The total global prevalence of musculoskeletal disorders in shoulders is 55.63%.⁽⁵⁾ There is major risk of development of upper extremity musculoskeletal disorders in both male as well as female during the activity of wall painting.⁽⁷⁾ Working required over shoulder level including painters such as industrial workers which are exposed to this tasks.⁽⁷⁾ Various contributing factor on the development of musculoskeletal disorders at the shoulder are working conditions and working methods.⁽⁶⁾ There are various occupations related to the shoulder pain which have been associated with different type of work like working with elevated arms , monotonous repetitive work and also forceful exertions.⁽⁶⁾

There may be one determinant of rotator cuff impingement working with the hands at or above shoulder level.⁽⁸⁾ Causative factor for impingement with the high risk is repetitive motion of the shoulder.⁽⁸⁾ During shoulder abduction greatest stress forces is seen in supraspinatus muscle.⁽⁸⁾ The repetitive movement leads to minor injuries of the surrounding structures of the shoulder joint mainly rotator cuff musculature.⁽⁹⁾ The continuous movements will lead to awkward posture which will provoke the pain and symptoms.⁽⁹⁾ Increased levels of muscle activity with few periods of low activity (micropauses) during awkward and static postures, and during repetitive movements, may result in shoulder pain.⁽¹⁰⁾

In manual painters there is repetitive activity which may ultimately increases the risk of supraspinatus impingement. The painting workshops reported that most of the problems were originated from inappropriate hand tools, awkward working postures and unsuitable work organization.⁽¹⁰⁾

Apart from this there are many workers which suffer from this issues and are unnoticed ,thus this study is helpful for them to reduce the risk of further injury by making them ergonomically aware.

NEED OF STUDY

The posture exposed to the painters is to work with arms elevated above the shoulder level which is mainly a awkward posture.⁽¹⁰⁾ Most of the painters are engaged in repetitive overhead activities like painting the ceiling of house, walls which is really an occupation. There may be excessive mechanical load at the supraspinatus tendon insertion while painting this causes an increased rate of compression of the tendon.⁽¹⁰⁾ Impingement mainly comes under the pathogenesis of rotator cuff tendon, the compression of rotator cuff tendon occur when they are forced under the coracoacromial arch during the elevation of the arm.⁽⁸⁾

Anterior edge of the acromion cause force to the supraspinatus tendon which in turn causes compression that impairs blood circulation through the tendon. Reduced blood flow to the tendon because of static muscle contraction may contribute degeneration of rotator cuff tendon.⁽⁸⁾

Highly repetitive work and repeated or sustained shoulder postures with $> 60^{\circ}$ flexion or abduction were associated with shoulder disorders.⁽⁶⁾ Furthermore, a relationship was found between forceful exertions, a high level of static contractions, static loads, and extreme postures have a combination of these factors with shoulder disorders.⁽¹¹⁾

Due to the pain and discomfort it further affects their work, productivity towards their work, physical, social, socioeconomical and mental well being of the person, thus the study focuses to rule out how many painters are suffering from supraspinatus impingement along with pain assessed by visual analogue scale.

The study also focuses on using Hawkins – Kennedy Impingement test as an outcome measure to find out prevalence of supraspinatus impingement in painters. There is no prevalence study of supraspinatus impingement in painters conducted before with or without combination of visual analogue scale and Hawkins–Kennedy Impingement test.

Due to repetitive overhead activities they are prone to musculoskeletal risk which further leads to pain and discomfort.⁽⁶⁾

The main initiative of the study is to determine prevalence of musculoskeletal disorders mainly supraspinatus impingement in painters. As there are not much studies conducted before, the study would be beneficial as it takes less duration to predict whether supraspinatus impingement present or absent.

METHODOLOGY

- Study design - Observational Study.
- Study Setup - All construction sites In and around city.

- Sampling method – Convenient sampling .
- Sample size – 85
- Study Duration – 6 months.
- Target Population – Male Painters

PROCEDURE

- Ethical committee approval was obtained from the institutional ethical committee.
- Subjects was screened as per inclusion and exclusion criteria to find out prevalence of supraspinatus impingement in painters. N = 85
- Procedure was explained to the subjects.
- Written informed consent was given to the subjects.
- Subjects was assessed using Visual analogue scale and was filled accordingly.
- Hawkins-Kennedy Impingement Test was used to assess the supraspinatus tendon.
- Pain during the internal rotation movement indicated a positive test.
- Data was collected and data analysis was done using descriptive statistics.
- Final result was obtained.





Screening of Subject

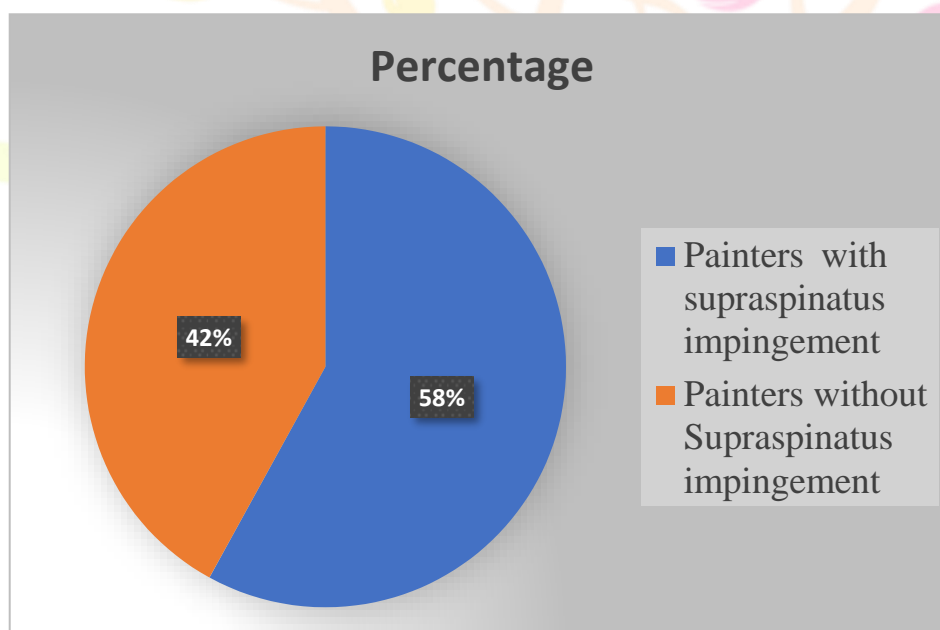


Performing the Hawkins – Kennedy Impingement Test

RESULTS

CATEGORY	NUMBER OF PAINTERS	PERCENTAGE
Painters with Supraspinatus Impingement	49	58%
Painters without Supraspinatus Impingement	36	42%

Table – 1 Shows the Prevalence of Supraspinatus Impingement in Painters. PREVALENCE OF SUPRASPINATUS IMPINGEMENT IN PAINTERS.



Interpretation :- Graph 1 shows prevalence of supraspinatus impingement in painters. It states that there is 58% prevalence and the 42% does not have supraspinatus impingement.

DISCUSSION

In this study the Prevalence of Supraspinatus Impingement in Painters was checked.

Pain on elevation of the arm is a common symptom of the shoulder disorders. Thus work above shoulder level may provoke pain. There may be one determinant of rotator cuff impingement working with the hands at or above shoulder level. Causative factor for impingement with the high risk is repetitive motion of the shoulder.

Impingement mainly comes under the pathogenesis of rotator cuff tendon, the compression of rotator cuff tendon occurs when they are forced under the coracoacromial arch during the elevation of the arm.

During shoulder abduction greatest stress forces is seen in supraspinatus muscle. There is excessive mechanical load at the supraspinatus tendon insertion while painting causes an increased rate of compression of the tendon. The Supraspinatus tendon is particularly at high risk for subsequent injury because it is likely to contact the acromion when humerus is abducted to 90 degree and internally rotated to 45 degree. Due to repetitive overhead activities they are prone to musculoskeletal risk which further leads to pain and discomfort.

Van Rijn RM, Huisstede BMA, et.al. Scand J Work Environ Health reported that highly repetitive work and repeated or sustained shoulder postures with $> 60^{\circ}$ flexion or abduction was associated with shoulder disorders. further more, a relationship was found between forceful exertions , a high level of static contraction ,static loads , and extreme postures has a combination of these factors with shoulder disorders.

M Shanmugam, B K Gnanavel, et.al. reported that the highest prevalence of MSDs among building painters was reported as 70.8%. The highest prevalence rate has been found in the shoulder region (69.5%).The repetitive task, awkward postures, forceful exertions and work height above shoulder level were reported as highly contributing factors of MSDs among building painters. It is concluded that various ergonomic risk factors were investigated and reported among building painters in South India.

Several other studies have found that the Painters are involved in awkward posture for a long duration. Also there is a direct load bearing on the shoulder joint while painting on a high platform, even there is a repetitive arm movement and painters work in height above their shoulder level.

In this study while collecting the data it was found that most of the painters were working continuously for 8 – 10 hours each day and they were taking rest only for half to one hour between the working hours. this reason supports the study that painting is an occupation that may lead to injuries to shoulder joint and the surrounding structures.

The present study was conducted to find out the prevalence of supraspinatus impingement in painters. As per data by using Hawkins – Kennedy Impingement test the study shows that there was prevalence of 58% of supraspinatus impingement in Painters.

CONCLUSION

According to the study it suggests that there is 58% prevalence of supraspinatus impingement in painters.

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