



*Research Article*

## **Prevalence of impingement syndrome due to overhead activity in construction site workers**

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### **ABSTRACT**

The aim of this study was to assess the impingement syndrome due to overhead activity by Hawkins-Kennedy impingement test, Neer impingement test, Posterior internal impingement test in construction workers.

**Methods:** A cross-sectional study was conducted from in a construction sites in and around the town. A consent form was signed by the participants before taking their assessment and all the details explained in Marathi. Information on shoulder disorder was collected by physical examination. Impingement syndrome was diagnosed by the special test. A total of 81 participants 16 women and 65 men were assessed. Participants had to be between the ages of 30 and 60 years.

**Result:** On examination, the examiner could reproduce the same pain in 61/81 (75.30%) patients only Of the 81 patients, Hawkins-Kennedy impingement test, Neer impingement test ,Posterior internal impingement test were positive in shoulders of 61(75.30%)patients, , Neer impingement test in 15(23.07%) were males and 9(56.25%) female, Hawkins-Kennedy impingement test 22(33.84%) were male and 2(22.22%) female, Posterior internal impingement test 12(18.46%) were male and 1(6.25%) female.

**Conclusion:** Work involving a lot of shoulder work increases A possibility of shoulder impingement syndrome. Impingement syndrome is more common in people exposed to upper-extremity workloads and postures in the workplace which emphasizes the necessity of lowering occupational exposures and identifying symptoms early in highly exposed occupational groups.

**Keywords:** Impingement syndrome, Construction worker, overhead activity.

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### **INTRODUCTION**

Neer coined the concept "impingement" in 1972. Shoulder impingement is a prevalent underlying reasons for shoulder pain and has a significant socioeconomic impact due to its impact on work ability<sup>1</sup>. In 1983, Neer described impingement as a mechanical compressive damage to the tissues of the subacromial area<sup>2</sup>. The subacromial region is bounded by the coracoacromial arch, the humeral head, and the anterior portion of the acromion. Between these two osseous structures, the structures are impinged<sup>2</sup>. Posterior internal impingement was initially characterized as excessive contact between the posterior superior glenoid rim or labrum and the undersurface of the supraspinatus and infraspinatus tendons in 1992 by Walch et al<sup>3</sup>.

There are two types of impingement syndrome: primary and secondary. The subacromial space is mechanically narrowed by structural changes that result in primary impingement<sup>4</sup>. An impairment in the humeral head's functional centering leads to secondary impingement<sup>4</sup>. When the space between the acromion and the rotator cuff tendons narrows, either caused by structural difficulties or repeated overhead movements, the tendons and bursa may become compressed and inflamed. This compression can cause inflammation, discomfort and reduce range of motion in the shoulder<sup>4</sup>.

Impingement syndrome may result from often performing tasks overhead. incorrect posture, muscle imbalance, or structural problem in the shoulder joint. Subacromial Impingement Syndrome can be caused by either intrinsic or extrinsic factors,

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resulting in weakness, muscle imbalances, osteophytes, acromial alterations, and changed kinematics that lead to impingement<sup>2</sup>. Intrinsic impingement is a degenerative process caused by repetitive usage, tension overload, or trauma to the tendons. Extrinsic impingement occurs when the tendon becomes inflamed and degenerates due to coracoacromial arch pathology, poor posture, altered scapular or Gleno-humeral kinematics, or capsular tightness. Overhead industrial workers frequently have shoulder pain due to intrinsic impingement<sup>2</sup>.

In several countries, a correlation between upper limb problems and work is a common problem. The frequent appearance of shoulder pain or specific diseases like shoulder impingement syndrome is particularly high among industrial plant workers<sup>1</sup>. Occupational mechanical exposures, such as upper arm elevation, repetitive shoulder movements, and powerful shoulder exertions (e.g., lifting, carrying, pushing, and pulling weights), are known risk factors for subacromial impingement<sup>13</sup>.

Workers who construct buildings are exposed to a variety of health risks at work and suffer from occupational health hazards<sup>2</sup>. These can include working in the construction business in uncomfortable postures, handling heavy objects, and being exposed to dust and fumes, all of which can lead to musculoskeletal issues. Employees in the construction sector perform many different kinds of tasks. Workers constantly lift and carry objects overhead to complete their task. Work duties that exert strain on the shoulder joint and require holding objects over the head can cause injury. This results in inflammation, degeneration, and rupture of the tendon. Patients with this condition are usually older than thirty and have chronic pain without any history of trauma. Excessive stress or a minor injury could be the cause of shoulder pain<sup>2</sup>. In construction workers who have done over head activity in daily they have faces many problems in shoulder so their need to study the exact prevalence of impingement syndrome due to overhead activity in construction site workers.

### **METHODOLOGY**

Participants:-

A cross-sectional research was conducted from in a construction sites in and around the town. This study included prevalence of impingement syndrome due to overhead activity in construction site workers. For this reason, a study was conducted. Patients who were cooperative, patients who were willing to participate considering the inclusion and exclusion criteria were included in the study. A consent form was signed by the participants before taking their assessment and all the details explained in Marathi. The respondents were informed about the the study's goal as well as the fact that participation in the study was totally voluntary. A total of 81 participants 16 women and 65 men were assessed. Participants had to be between the ages of 30 and 60 years.

Data Collection Tools:-

Special test:-

#### • **Hawkins-Kennedy impingement test.**

**PURPOSE-** The Hawkins-Kennedy impingement test aims to reduce the distance between the inferior side of the acromial

arch and the superior surface of the humeral head. The additional compressive stresses then place pressure on the supraspinatus tendon, the long head biceps tendon, the subacromial bursa, and/or the coracoacromial ligament.

**PATIENT POSITION-**The patient may be standing or sitting.

**EXAMINER POSITION-**The examiner stands adjacent and slightly to the front of the shoulder to be tested.

**TEST PROCEDURE-** The examiner places one hand on the patient's elbow for support and stability while grasping the wrist with the other. The examiner flexes the elbow to 90°, then forward-flexes the arm to 90° before aggressively rotating the shoulder medially. This movement presses the supraspinatus tendon against the anterior surface of the coracoacromial ligament and coracoid process.

#### • **Neer impingement test.**

**PURPOSE-** The Neer impingement test aims to shorten the distance between the inferior side of the acromial arch and the superior surface of the humeral head. The compressive forces then apply pressure to the supraspinatus tendon, the long head biceps tendon, the subacromial bursa, and/or the coracoacromial ligament.

**PATIENT POSITION-** The patient may be standing or sitting.

**EXAMINER POSITION-** The examiner stands lateral and slightly behind the shoulder to be tested.

**TEST PROCEDURE-** The examiner wraps one hand around the patient's collarbone and scapula to help stabilize the scapula, and the other around the wrist or forearm. The examiner passively and forcefully lifts the arm entirely in the scapular plane before medially rotating it. This passive stress causes the larger tuberosity to jam against the acromion's anteroinferior border.

**INDICATIONS OF A POSITIVE TEST-** A positive test result is indicated by an expression of pain on the patient's face.

#### • **Posterior internal impingement test.**

**PURPOSE-** To test for a lesion on the posterior of the shoulder labrum and rotator cuff.

**PATIENT POSITION-** In the supine posture, the patient lies down.

**EXAMINER POSITION-** The examiner stands adjacent to the shoulder to be tested.

**TEST PROCEDURE-** The examiner holds the patient's wrist and regulates shoulder movement with one hand while supporting and stabilizing the patient with the other beneath the elbow. In order to allow for maximum lateral rotation and 15° to 20° of forward flexion, the examiner comfortably abducts the shoulder to 90°.

**INDICATIONS OF A POSITIVE TEST-** The test result is considered positive if it elicits localized pain in the posterior shoulder.

### **CONCLUSION:**

Work involving a lot of shoulder work increases A possibility of shoulder impingement syndrome.. Impingement syndrome is more common in people exposed to upper-extremity workloads and postures in the workplace which emphasizes the necessity of lowering occupational exposures and identifying symptoms early in highly exposed occupational groups.

**RESULTS**

Age distribution table

AGE	PEOPLES	POSITIVE	NEGATIVE
30-40	59(72%)	42(71.18%)	17(28.81%)
40-50	18(22%)	15(83.33%)	3(16.66%)
50-60	4(4.9%)	4(100%)	0(0%)

Interpretation:-

The participant included in study the age group between 30-60.59 participants with age group between 30-40.18 participants with age group between 40-50. 4 participants with age group between 50-60. In age group between 30-40 participants were

found positive 71.18% and 28.81% participant are negative. In age group between 40-50 participants were found positive 83.33% and 16.66% participant are negative. In age group between 50-60 participants were found positive 4.9% and 0% participant are negative.

Gender distribution table

GENDER	A		B		C	
	A1 (Positive)	A2 (Negative)	B1 (Positive)	B2 (Negative)	C1 (Positive)	C2 (Negative)
MALE-65	15	50	22	43	12	53
FEMALE-16	9	7	2	14	1	15

Interpretation:-

- A. Among 81 participants 65(80.24%) were males and 16(19.75%) were females. In Neer test 15(23.07%) were males and 9(56.25%) female who are having impingement.
- B. In Hawkins-Kennedy impingement test 22(33.84%) were male and 2(22.22%) female who are having impingement.
- C. Posterior internal impingement test 12(18.46%) were male and 1(6.25%) female who are having impingement.

**Discussion**

Understanding impingement syndrome requires a good understanding of shoulder anatomy. The shoulder girdle is made up of seven biomechanically connected joints: the glenohumeral, suprahumeral, acromioclavicular, scapulocostal, sternoclavicular, sternocostal, and costovertebral joints<sup>1</sup>. The suprahumeral joint should get special attention while treating impingement syndrome. Traditionally, this location does not represent an articulation between two bones, but has a strong functional anatomic link between related components that can be susceptible to pathologic change<sup>10</sup>.

Shoulder impingement is a prevalent cause of shoulder pain and has a significant socioeconomic impact due to its impact on work ability<sup>14</sup>. The subacromial region is bounded by the coracoacromial arch, the humeral head, and the anterior portion of the acromion.<sup>1</sup> The estimated prevalence of shoulder problems is between 7% to 34%, with shoulder impingement syndrome being the most common underlying cause<sup>15</sup>. When shoulder impingement syndrome happens, a specific arm position or activity causes impingement pain. Bony anomalies, such as hooked acromion, lengthened coracoid process, and the production of enthesophytes and osteophytes, are more common. Classic shoulder impingement syndrome affects the coracoacromial ligament, located on the anterior edge and underside of the acromion's anterior third<sup>6</sup>.

When an athlete makes overhead movements or throws something, the stabilizing structures of the shoulder are subjected to repetitive, high-energy strains. Chronic stress causes the static stabilizers in the shoulder to become

hyperelastic, which can lead to anterior glenohumeral subluxation, contact with the coracoacromial arch, and secondary subacromial impingement<sup>10</sup>.

This study aimed to determine the rotator cuff muscle strength in individuals suffering from shoulder impingement syndrome. According to studies, shoulder impingement syndrome might reduce quality of life by causing pain at work and day-to-day activities<sup>8</sup>. Shoulder functional abnormalities or pain may limit daily tasks, reduce quality of life, and lead to serious disorders that hamper long-term work<sup>11</sup>.

The shoulder load variable was created to assess the joint biomechanical exposure that could come from any of the three main exposures. (repetitive labor, work with elevated arms, or forceful activity) or from a combination of two or all three. hazards related to one or more exposures were merged, so analyses employing the variable may understate the hazards related to combined exposures.

Workers who experienced upper-extremity loading (push/pull/lift), high hand grip force, handheld tool use, frequent work with hands above shoulders, static labor, and hand-arm vibration were at a higher risk. Most of the exposure risk factors indicated an exposure-response relationship. Age, small stature, smoking, and BMI were all found as risk factors<sup>9</sup>.

More than 50% of women report experiencing musculoskeletal pain during menopause. Women typically present with joint discomfort between the ages of 45 and 55. Menopause and estrogen deficiency may play a role, although there is little direct causal proof due to the prevalence of musculoskeletal discomfort throughout life. When adjusted for age, women are twice as likely to report joint pain and stiffness during or after menopause than premenopausal women<sup>7</sup>.

The research worked on the incidence of impingement syndrome due to overhead activity in construction site workers. The study was conducted in karad. The participant included in study the age group between 30-60. 59 participants with age group between 30-40.18 participants with age group between 40-50. 4 participants with age group between 50-60. 81

participant were taken out of which 75% population had shoulder impingement syndrome.

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