

**A CASE REPORT ON EFFECTIVENESS OF SPENCER TECHNIQUE ON PAIN,
ROM, AND DISABILITY IN A SUBJECT WITH SHOULDER IMPINGEMENT
SYNDROME**

UNDER PEER REVIEW IN IJAR

4 **ABSTRACT**

5 Background-Shoulder impingement syndrome is characterized by tendinitis in the rotator cuff
6 muscles as they travel through the space beneath the acromion or subacromial space. It is
7 accompanied with shoulder pain, limited range of motion and weakness in resisted abduction
8 and forward flexion and stiffness.^[1] shoulder impingement occurs in 1 to 5% of the 7 to 30%
9 prevalence of shoulder pain.^[2] Frozen shoulder, also known as adhesive capsulitis, is a
10 common pathologic condition of the shoulder joint. It is characterized by progressive
11 shoulder pain and restriction of the range of motion.^[3] In general population, prevalence rate
12 of frozen shoulder is as high as 8.2% in males and 10.1% in females, with a peak incidence at
13 55 years of age.^[4] Various studies show that Spencer technique is effective in reducing pain,
14 improving ROM and relieving stiffness. Spencer technique is an articular technique with
15 seven different procedures used to treat shoulder restriction caused by adhesive
16 capsulitis.^[5,6,7,8,9,,17] Since shoulder impingement and frozen shoulder have similar or
17 common symptoms, Spencer technique might also be effective in treating symptoms of
18 Shoulder impingement syndrome. A patient with shoulder impingement syndrome was
19 assessed. Along with conventional therapy for shoulder impingement, Spencer technique was
20 provided to the patient as a part of rehab program to improve range of motion and decrease
21 pain.

22 Study design: A case study.

23 Case Description: This case study describes the physical therapy intervention given for a
24 27-year-old who is a acute case of shoulder impingement syndrome.

25 Result: A 4-weeks case report showed significant improvement in NPRS from 9/10 to 0/10,
26 SPADI from 56.92 to 3.074 and ROM: Flexion 0-150° to 0-170° , Extension 0-50° to 0 -
27 60°, Abduction 0-140° to 0-170°, Internal rotation 0-60° to 0- 82°, External rotation 0-45°
28 to 0-85°.

30
31 Conclusion: This study suggests that Spencer technique with conventional therapy is
32 effective on pain, ROM, and disability in subject with shoulder impingement syndrome.

33
34
35 Key words: Shoulder Impingement Syndrome (SIS), Spencer technique, scapular
36 stabilization exercises

INTRODUCTION

Shoulder impingement syndrome is characterized by tendinitis in the rotator cuff muscles as they travel through the space beneath the acromion or subacromial space. It is accompanied with shoulder pain, limited range of motion and weakness in resisted abduction and forward flexion and stiffness.^[1] Shoulder impingement occurs in 1 to 5% of the 7 to 30% prevalence of shoulder pain.^[2] The sixth decade of life is the time of peak occurrence. Neer introduced SIS in 1972 and separated it into three phases: Stage I: Hemorrhage and edema; Stage II: Fibrosis and tendinitis; Stage III: Rotator cuff tears, biceps ruptures, and skeletal abnormalities (Neer 1983). According to Neer's 1972 description, SIS was first thought to result from mechanical friction of the tendon beneath the acromion.^[16] Impingement Syndrome Types: Primary: Here, subacromial overloading causes impingement beneath the coracoacromial arch. Secondary: scapulothoracic instability or microinstability of the glenohumeral joint is the cause of this relative decrease in the subacromial arch. Tennis players, swimmers, and throwers are examples of athletes who have posterior (internal) tendencies. When the arm is lifted and rotated externally, the supra- and infraspinatus tendons are pinched between the superior and posterior sides of the glenoid. The primary impingement is the most frequent of the three. Rotator Cuff Tear.^[1]

The mechanical (extrinsic) and degenerative (intrinsic) theories are the two primary classifications that have been described to identify the genesis of SIS. By classifying SIS into anatomical components (acromion form and AC degeneration) and biomechanical elements (scapular kinematics, humeral kinematics, the influence of posture on thoracic spine kyphosis, muscle shortage, and soft tissue tightness), extrinsic mechanisms can be constructed. Among the intrinsic mechanisms are modifications that affect the tendons directly. They may result from biological changes, aging, diminished blood supply, and alterations in mechanical properties, tensile/shear overload, overuse, or trauma along the morphology. Several risk factors are common in the age, gender, hand dominance, work, obesity, psychological & psychosocial factors, and other factors like DM, Parkinson disease and Stroke are also risk factors for shoulder pain.^[14]

Those tests specific to SIS include the Hawkins Kennedy test, Neer test, Jobe test, and a painful arc sign. Individually, these tests have low sensitivity and specificity, but when combined, they can help complete the picture of SIS.^[14]

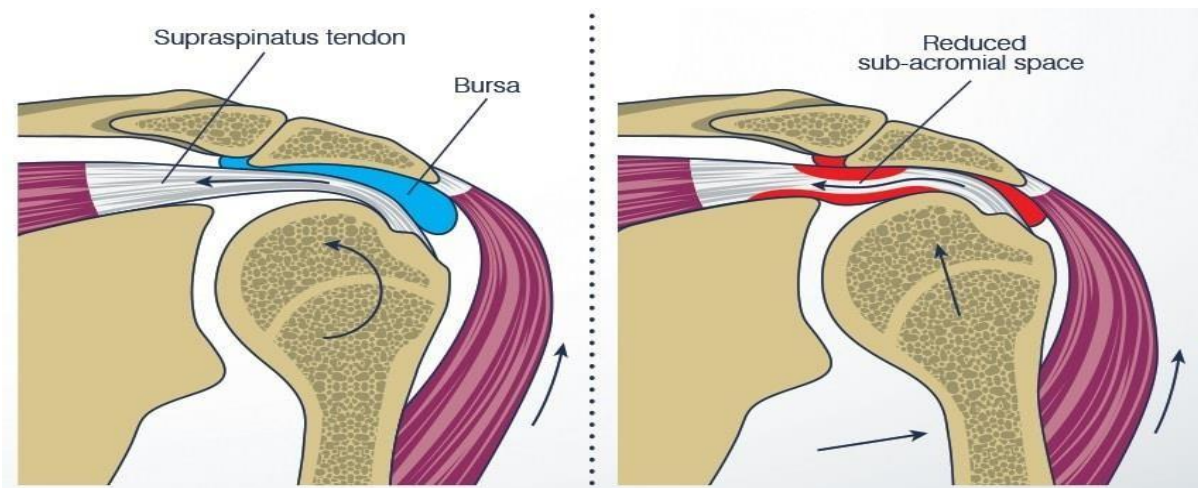


Fig-1: Pathophysiology of shoulder impingement syndrome

Spencer technique improves blood flow and lymphatic drainage, releases muscle and fascia, and increases synovial fluid production, making it more successful in treating frozen shoulder discomfort, range of motion, and functional impairment. . Similarities between shoulder impingement and frozen shoulder in terms of joint stiffness, range of motion, pain, etc. For the treatment of shoulder impingement syndrome, electrotherapy (TENS, IFT, and Ultrasound), contrast baths, strengthening exercises, scapular positioning exercises, and manual therapy are necessary.^[10,11,12,13,18] Numerous studies demonstrate the effectiveness of the Spencer technique in easing stiffness, increasing range of motion, and lowering pain in frozen shoulder patients .However, because there is either little or no proof of the Spencer technique's effectiveness in treating shoulder impingement syndrome. Thus, the necessity for this study arises.

The objective of this study is to see the effects of Spencer technique on improving range of motion and reducing pain in shoulder impingement syndrome.

CASE DESCRIPTION

Patient history/subjective findings

Apparently normal 27-year-old male patient 1 month prior to assessment started experiencing pain in his right shoulder while lifting heavy weights while exercising in the gym for which he consulted an orthopedician on 08-06-24 and was advised to take medications and physiotherapy. Patient could not undergo physiotherapy. Pain did not subside even after taking medications. On 05-07-24, he visited Aditya physiotherapy center for physiotherapy management. Patient has no history of Hypertension, Diabetes Mellitus, Bronchial Asthma, Epilepsy, etc.

On observation patient is fairly built. No other observational/postural changes observed. Pain intensity (NPRS)- 9/10 . ON Palpation, tenderness:-grade-1, crepitus was felt during shoulder movements, anterior and lateral deltoid muscle spasm.

On examination left shoulder all the ROM was maintained and the right shoulder flexion was 0-150°, shoulder extension was 0-50°, shoulder abduction was 0-140°, shoulder adduction was 140°-0,shoulder external rotation was 0-45°,shoulder internal rotation was 0-60° , shoulder horizontal abduction 0-90° and shoulder horizontal adduction was 0-30°.

The muscle power of left shoulder was maintained 5 and the right shoulder flexors were 3+, extensors were 3+, abductors were 3+, adductors were 3+, external rotators were 3+ & internal rotators were 3. The end feel of left shoulder flexion was firm, extension was firm, abduction was firm, adduction was soft , external rotation was firm, internal rotation was firm and the end feel of right shoulder was empty.

OUTCOME MEASURE

The SPADI score reduced from 56.92 to 3.076.

METHODS & METHODOLOGY

METHODOLOGY

- Duration: 1.5 months
- Number of subject: 1
- Subject source: Aditya Physiotherapy center
- Study design: Case study
- Duration of treatment: 4 weeks
- Duration of follow-up: after 2 weeks of intervention
- Materials used: Goniometer, ice packs, hydrocollator hot packs, Therabands, Dumbbell, Pillow,

PROCEDURE

The setting for this case study was Aditya physiotherapy centre. Study procedure was explained to the subject and signed consent was obtained before the intervention. Six weeks was the length of the treatment which included Strengthening exercises, IFT, Spencer technique, Scapular stability exercises, and Contrast bath treatment. 2 weeks after the completion of treatment follow up was done to the patient where Pain, ROM, muscle strength and SPADI was used to see the improvements and adherence to exercise.

INTERVENTION

The short-term and long-term goals were set before the treatment.

Short-Term Goals:

1. To Relieve Pain
2. To Improve ROM

Long-Term Goals:

1. To Improve ROM
2. to Increase Muscle Strength & Endurance

The interventions in this study involved the application of Spencer technique and a series of exercises. The exercise protocol comprised scapular setting exercises, shoulder strengthening exercises, IFT and contrast bath .These exercises were performed over 4 weeks in a conjunction with Spencer technique.

Table-1 Rehab Protocol

SN	Duration	Intervention	Dosage
1	0-2 weeks	IFT	Intensity: 0.5 mA Frequency: 0-100Hz Duration: 10min x 3 sessions/week
2	0-2 weeks	Contrast bath	Duration: 10min 1 set x 3 sessions/week
3	0-2 weeks	Spencer technique	3 reps x 3 sets 3-4 sec hold in each set (1 min rest between sets) 3 sessions/week
4	2-4 weeks	Contrast bath	Duration: 10min 1 set x 3 sessions/week
5	2-4 weeks	Spencer technique	3 reps x 3 sets 3-4 sec hold in each set (1 min rest between sets) 3 sessions/week
6	2-4 weeks	Strengthening exercises 1. Shoulder internal & external rotators and others muscles (flexors, extensors, abductors, adductors) by Therabands 2. Scapular setting exercises (scapular depression, scapular clock exercises, wall push up and Codman's exercise)	5 reps x 3 sets 3 sessions/week

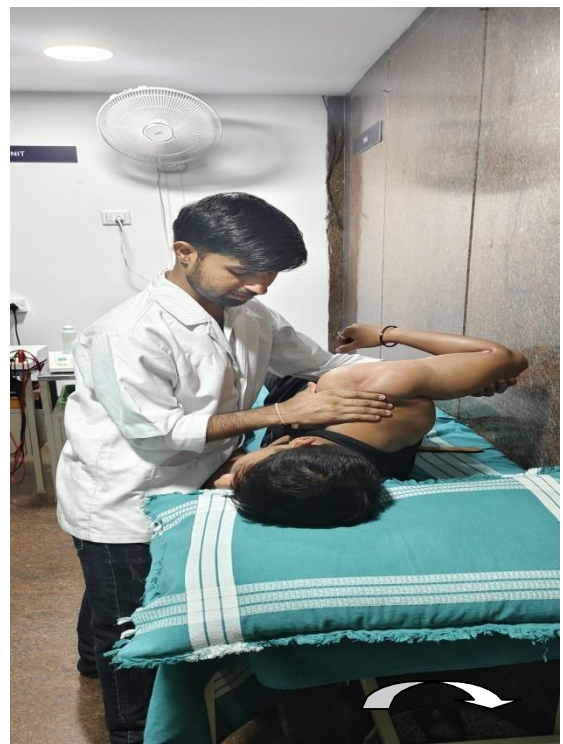


Fig-2: IFT
(extension)



Fig-3: Step 1 (Shoulder



Fig-4: Step 2(Shoulder flexion)
(compression)



Fig-5: Step 3(Circumduction with



Fig-6: Step 4(Circumduction with traction)

Fig-7: Step 5(Shoulder abduction and IR)

RESULT

A 4-Weeks case report on shoulder impingement syndrome showed significance in reducing pain NPRS from 9/10 to 0/10, increasing ROM shoulder flexion from (0-150°) to (0-170°), shoulder extension from (0-50°) to (0-60°), shoulder abduction from (0-140°) to (0-170°), shoulder adduction from (140°-0) to (170°-0), internal rotation from (0-60) to (0-82°), external rotation from (0-45°) to (0-85°) and horizontal abduction & adduction from (0-90°&0-30°) to (0-125° & 0-40°).The SPADI score reduced from 56.92 to 3.076.

The result in this study showed significant reducing in pain, improving range of motion and functional ability.

All the pre and post-result of NPRS, ROM examination, manual muscle testing and end feel test shows the improvement after 4 weeks.

Table-2 ROM (Post-treatment):

<u>Shoulder Motion</u>	<u>Pre- (Right)</u>	<u>Post- (Right)</u>	<u>Left</u>
Shoulder Flexion	0-150°	0-170°	0-170°
Shoulder Extension	0-50°	0-60°	0-60°
Shoulder Abduction	0-140°	0-170°	0-170°
Shoulder Adduction	140°-0	170°-0	170°-0
Shoulder External rotation	0-45°	0-85°	0-85°
Shoulder Internal rotation	0-60°	0-82°	0-82°
Shoulder Horizontal abductionl & adduction	0-90° & 0-30°	0-125° & 0-40°	0-125° & 0-40°

Table-3 MMT (Post-treatment):

<u>Shoulder muscle</u>	<u>Pre-Right Shoulder</u>	<u>Post-Right shoulder</u>
Shoulder Flexors	3+	4+
Shoulder Extensors	3+	4+
Shoulder Abductors	3+	4+
Shoulder Adductors	3+	4
Shoulder External rotators	3+	5
Shoulder Internal rotators	3	5

Table-4 END-FEEL(Post-treatment):

<u>Shoulder motion</u>	<u>Pre-Right</u>	<u>Post-Right</u>
Shoulder Flexion	Empty	Firm
Shoulder Extension	Empty	Firm
Shoulder Abduction	Empty	Firm
Shoulder Adduction	Empty	Soft
Shoulder External & internal rotation	Empty	Firm
Shoulder Horizontal abduction & adduction	Empty	Soft & firm

DISCUSSION

This case study aimed to see the effects of Spencer technique on improving range of motion and reducing pain in shoulder impingement syndrome. A 4-Week case report on effectiveness of Spencer technique on pain, ROM, and disability in a male subject aged 27 years with shoulder impingement syndrome showed Spencer technique (Muscle energy technique) was effective in reducing pain, improving ROM and muscle strength. SPADI score also reduced at post-treatment.

Spencer technique improves blood flow, lymphatic drainage, releases muscle and fascia, increases synovial fluid production making it more successful in treating frozen shoulder discomfort, range of motion, and functional impairment. In this case study Spencer technique was given along with conventional therapy to achieve fast recovery in reducing pain, improving ROM and muscle strength in shoulder impingement syndrome. Initially, patient was facing difficulty in performing pendulum exercises with weights, wall pushup and wall slide exercises. Patient was also not able to perform shoulder strengthening exercises with low resistance therabands. So resistances were tailored to patient while performing exercises.

Numerous studies demonstrate the effectiveness of the Spencer approach in easing stiffness, increasing range of motion, and lowering pain in frozen shoulder patients. However, there is either little or no proof of the Spencer technique's effectiveness in treating

shoulder impingement syndrome. The Spencer technique is a more effective treatment for shoulder impingement syndrome because it promotes the production of synovial fluid, relaxes muscle and fascia, and enhances blood flow and lymphatic drainage.

This case report showed fast recovery in reducing pain, disability, increasing ROM and muscle strength within a short-period. Initial first two weeks Spencer technique was given along with IFT and Contrast bath followed by Spencer technique, contrast bath and strengthening exercises in 3rd and 4th week. Strengthening exercises included strengthening of internal rotators and external rotators using theraband of multiple resistances for progression as well as scapular setting exercises (scapular depression, scapular clock exercises, wall push-up and Codman's exercise)

According to Deepika B et al. in the year 2024, the Spencer MET was more effective than PNF in adhesive capsulitis in reducing pain and disability. As known, clinically, frozen shoulder and shoulder impingement syndrome are very similar. So, this study provides evidence to this case study on the Spencer technique's effectiveness in treating shoulder impingement. Another study carried out in **2024 by Muhammad Abbas et al.**, The study also found that in patients with frozen shoulder, Maitland mobilization combined with Spencer METs was superior to Maitland mobilization alone in terms of pain reduction, range of motion, and functional ability. This study also concluded that Maitland Mobilization with Spencer METs was more effective than Maitland mobilization alone in reducing pain and improving ROM and functional capacity in patients with frozen shoulder. This experimental study's findings support the current research regarding range of motion, functional abilities, and pain reduction as the shoulder impingement syndrome's clinical manifestation.

To treat shoulder impingement syndrome, contrast baths, manual therapy, strengthening exercises, scapular alignment exercises, and electrotherapy (TENS, IFT, and ultrasound, low-level laser therapy) are required.^[11,12,13,14,18] Various studies showed that Gong's mobilization, Mulligan's mobilization and Myofascial Release (MFR) were comparatively more effective than Spencer technique in Frozen shoulder. So these techniques also may be more effective than spencer technique in shoulder impingement syndrome.^[19,20,21] But these techniques are still not proved that these are more effective than Spencer technique in treating shoulder impingement syndrome. Based on several recent studies on shoulder impingement syndrome, SPADI has been used as outcome measure in our current study.^[22,23,24]

In this case study we found that ROM of shoulder abduction, internal rotation and external rotation increased comparatively more than shoulder flexion and extension. The SPADI and NPRS was drastically reduced from 56.92 to 3.076 and 9/10 to 0/10. The patient's pain, range of motion, and functional capacity all nearly recovered in six weeks.

CONCLUSION

This study concludes that Spencer technique with conventional therapy is effective on pain, ROM, and disability in a subject with shoulder impingement syndrome.

REFERENCES

1. Ebnezar, J. and John, R. (2010a) *Textbook of orthopedics*. 4th end. New Delhi: Jaypee.
2. Horowitz EH, Aibinder WR. Shoulder impingement syndrome. *Physical Medicine and Rehabilitation Clinics*. 2023 May 1;34(2):311-34.
3. Cho CH, Lee YH, Kim YJ, Baek CS, Kim DH. Definition, diagnosis, treatment, and prognosis of frozen shoulder: a consensus survey of shoulder specialists. *Clinics in orthopedic surgery*. 2020 Mar
4. Gadgaard NR, Veres K, Henderson VW, Pedersen AB. Frozen Shoulder and the Risk of Parkinson's Disease: A Danish Registry-Based Cohort Study. *Clinical Epidemiology*. 2024 Dec 31:447-59.
5. Jivani RR, Hingarajia DN. Effect of Spencer muscle energy technique versus Maitland's mobilization technique on pain, ROM and disability in patients with frozen shoulder: a comparative study. *Int J Physiotherapy Res*. 2021 Aug 11; 9(4):3928-6.
6. Jeong KY. The effects of Spencer technique on the ROM, pain, function in patients with shoulder adhesive capsulitis. *The Journal of Korean Academy of Orthopedic Manual Physical Therapy*. 2018; 24(2):37-42.
7. Contractor ES, Agnihotri DS, Patel RM. Effect of spencer muscle energy technique on pain and functional disability in cases of adhesive capsulitis of shoulder joint. *IAIM*. 2016;3(8):126-31.
8. Gasibat Q, Rafieda AE, Alajnaf RB, Elgallai AA, Elzidani HA, Sowaid EM. Spencer Muscle Energy Technique Versus Conventional Treatment in Frozen Shoulder: A Randomized Controlled Trial. *International Journal of Kinesiology and Sports Science*. 2022 Jul 31;10(3):28-36.
9. Deepika B, Alagesan J, Buvanesh A, Ramadass A. Effect of Spencer Muscle Energy Technique and Proprioceptive Neuromuscular Facilitation in Adhesive Capsulitis. *Indian Journal of Physiotherapy & Occupational Therapy*. 2024 Jan 2;18.
10. Tugay M, Kul A. Efficacy of interferential current therapy in patients diagnosed with subacromial impingement syndrome. *The Eurasian Journal of Medicine*. 2023 Oct;55(3):192.
11. Fleming JA, Seitz AL, Ebaugh DD. Exercise protocol for the treatment of rotator cuff impingement syndrome. *Journal of athletic training*. 2010 Sep 1;45(5):483-

12. Sharma S, Ghrouz AK, Hussain ME, Sharma S, Aldabbas M, Ansari S. Progressive resistance exercises plus manual therapy is effective in improving isometric strength in overhead athletes with shoulder impingement syndrome: a randomized controlled trial. *BioMed research international*. 2021;2021(1):9945775.
13. Tauqeer S, Arooj A, Shakeel H. Effects of manual therapy in addition to stretching and strengthening exercises to improve scapular range of motion, functional capacity and pain in patients with shoulder impingement syndrome: a randomized controlled trial. *BMC Musculoskeletal Disorders*. 2024 Mar 2;25(1):192.
14. Gohil J, Zalavadiya G, Trivedi H. Effect of Spencer Technique Combined with Conventional Physiotherapy on Pain and Functional Disability in Patient with Shoulder Impingement Syndrome: An Experimental Study.
15. Muhammad Abbas *et al.* 'Effect of Maitland mobilization with and without Spencer Muscle Energy techniques in treatment of frozen shoulder', *Journal of Health and Rehabilitation Research*, 4(ICIC1), pp. 1342–1346. doi:10.61919/jhrr.v4iicic1.1099.
16. Gohil J, Zalavadiya G, Trivedi H. Effect of Spencer Technique Combined with Conventional Physiotherapy on Pain and Functional Disability in Patient with Shoulder Impingement Syndrome: An Experimental Study.
17. Phansopkar P. Impact of Spencer Technique on Pain, Range of Motion, and Functional Disability in Patients With Frozen Shoulder: A Pilot Study. *Cureus*. 2024 Jan 30;16(1).
18. El-Gendy MH, Abdulla YM, Abd Elmonaem G. Effect of Low-Level Laser Therapy and Manual Exercises on Shoulder Impingement Syndrome: A Systematic Review. *International Journal of Physiotherapy and Research*. 2021;9(4):3813-20.
19. Hussain MA, Premkumar M, Kavitha S. Comparison of Spencer Technique Versus Myofascial Release on Pain and Range of Motion in Periarthritis Shoulder. Age.;30:45years.
20. Prasanth S, Sreedharan S, Subbarayalu A, Shahul P. Comparative effect of Gong's mobilization and Spencer technique to manage frozen shoulder. *Physiotherapy Quarterly*. 2022;31(3):57-64.
21. Arif B, Maqbool S, Afzaal F, Noor A, Fatima A, Khalid U, Fatima I, Khalid A, Sardar N, Nadeem S, Shera D. Comparison of Effectiveness of Mulligan's Mobilization and Spencer Technique Along with Conventional Therapy for Frozen Shoulder. Randomized Controlled Trial RCT. *British Journal of Multidisciplinary and Advanced Studies*. 2023 Dec 29;4(6):73-83.
22. Turhan B, Doğan H, Maden Ç. Comparison of the Post Treatment Outcomes of a Conservative Physiotherapy Protocol for Subacromial Impingement Syndrome in Terms of Acromion Morphology. *European Journal of Therapeutics*. 2024 Feb 9.
23. Vaishnavi Raut DS. Effectiveness of Blackburn Exercise on Pain, ROM and Disability in Shoulder Impingement Syndrome among Construction Workers: An Experimental Study.
24. Afzaal F, Randhawa MM. Comparative effects of active release technique and soft tissue mobilization in shoulder impingement syndrom: a randomized clinical trial. *Insights-Journal of Health and Rehabilitation*. 2024 Oct 31;2(2 (Health & Rehab)):96-102.

UNDER PEER REVIEW IN IJAR