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A RANDOMIZED COMPARATIVE STUDY OF TREATMENT EFFICACY BETWEEN HYDRODILATATION AND SUPRASCAPULAR NERVE BLOCK IN THE PATIENTS WITH PERIARTHRITIS SHOULDER

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ABSTRACT

Shoulder pain is the third most common musculoskeletal problem after back and knee pain. Diagnosis of periarthritis shoulder (PA) is made clinically in the form of gradual onset of severe shoulder pain with the progressive limitations of active and passive glenohumeral movement without any significant radiographic findings. **Objectives:** To find out the better treatment modality for PA Shoulder,out of hydrodilatation and suprascapular nerve blocks. To compare pain and disability using SPADI score, pain using VAS, shoulder specific QUALITY OF LIFE (QOL) based on WORC index & effect of diabetes on treatment efficacy within each group. **Results:** In group A intra group improvement in forward flexion, Extension, Abduction, External rotation, Internal rotation from baseline to 3rd month is statistically significant. In group B average intra group improvement in forward flexion, Extension, Abduction, External rotation, Internal rotation from baseline to 3rd month is statistically significant. Average improvement in VAS from baseline to 1st month and 3rd month in group B is statistically non-significant. Average improvement in SPADI Outcome measures from baseline to 3rdmonth in group B is statistically significant. Average improvement in WORC Outcome measures from baseline to 1st month and 3rd month in group B is statistically non-significant. **Conclusion:** Suprascapular nerve block and hydrodilatation, both are effective. Remarkable improvement in pain and range of motion was observed in both the groups. Hydrodilatation is a simple, cost-effective procedure; it causes breaking of adhesions and eventual rupture of capsule thus improving the range of motion and functional capacity of the shoulder joint.

INTRODUCTION

Shoulder pain is the third most common musculoskeletal problem after back and knee pain. Annually 1% of adults are likely to consult with new shoulder pain. Four most common underlying causes are rotator cuff disorders (85% of cases), glenohumeral disorders, acromioclavicular joint pathology and referred neck pain. The estimated prevalence of periarthritis shoulder 2-5% in general population and 11-30% in diabetic population. It mainly affects the older population, with a female predominance. The term "Frozen Shoulder" was first introduced by Codman in 1934.[1]

He described it as a painful shoulder condition of insidious onset that was associated with stiffness and difficulty sleeping on the affected side. Long before Codman, in 1872, the same condition had already been labelled "Peri-arthritis" by Duplay.[2]

In 1945, Naviesar coined the term "Adhesive Capsulitis.[3]

The American Shoulder and Elbow Surgeons (ASES) defines adhesive capsulitis as "a condition of uncertain aetiology characterized by significant restriction of both active and passive shoulder motion that occurs in absence of a known intrinsic shoulder disorder". Risk factors are minor upper limb trauma, overuse injury, surgery, and/or neurosurgery, systemic diseases like diabetes, thyroid disorders, osteoporosis, cardiovascular disease, stroke, parkinson disease. Periarthritis shoulder in diabetic is very well known. Periarthritis shoulder can be primary or secondary type. In primary type, the onset is generally idiopathic. Secondary periarthritis shoulder may be due to systemic causes like diabetes mellitus, rheumatoid arthritis, hypothyroidism; extrinsic factors like cardiopulmonary disease, cervical disc, humerus

fracture, Parkinson's disease; intrinsic factors like rotator cuff pathologies, biceps tendinopathy, calcific tendinopathy.[4,5]

Four stages of Adhesive Capsulitis given by Hannafin & Chiaia are: Painful stage, freezing stage, frozen stage and thawing stage.[6]

Histopathological evidence suggests that there is synovial inflammation followed by capsular fibrosis, in which type 1 and 3 collagens laid down with subsequent tissue contraction. Cytogenetic analysis study has revealed elevated fibrogenic metallproteinase (MMP 3) as well as inflammatory (IL-6) cytokines. Diagnosis of Periarthritis shoulder is a clinical made from of gradual onset of severe shoulder pain with the progressive limitations of active and passive glenohumeral movement without any significant radiographic findings. Treatment aims to preserve mobility, flexibility and to minimize pain of the shoulder. These includes therapeutic modalities like hot and cold compression packs, various therapeutic exercises are pendulum stretch, towel stretch, finger walk cross body reach, an armpit stretch etc., medications like NSAIDS, paracetamol and tramadol. Hydrodilatation (joint-distension), intraarticular corticosteroid injection, suprascapular nerve blocks, manipulation under anesthesia and arthroscopic capsular release etc. are various interventions that are used.

The suprascapular nerve supplies 70% of the sensory nerve supply to the shoulder joint and its block involves a small injection of local anaesthetic above the spine of the scapula and an infiltration of long acting local anaesthetic around the suprascapular nerve. The hydrodilatation procedure is a high-volume intra-articular injection consisting of around 10–60 ml of normal saline solution to distend the joint capsule and break up scar tissue, improving movement of the shoulder.

Aims of the present study

- To find out the better treatment modality for patients with peri-arthritis shoulder.
- To compare pain and disability using SPADI (Shoulder pain and disability index) score between the groups.
- To compare pain using VAS (Visual Analogue Scale) between the groups.
- To compare shoulder specific Quality of Life (Qol) Based on Worc (The Western Ontario Rotator Cuff) index between the groups.
- To study the effect of diabetes on treatment efficacy within each group.

MATERIALS AND METHODS

Present study was conducted in the Department of Physical Medicine and Rehabilitation, S.M.S. Medical College and Attached Hospitals, Jaipur, Rajasthan, India from the year 2019 to 2022 after taking due permission from the institutional ethics committee.

Inclusion Criteria

- Patients with history of chronic shoulder pain and decreased range of motion (active and passive) at shoulder more than 12 weeks (3 month).
- Age group 30-70 years.
- Either sex.
- Patients with pain and stiffness for at-least 4 weeks.
- Who has been on conservative management like pain killers, physiotherapy and has not undergone any interventional treatment.
- Patients who give consent to participate in study.

Exclusion criteria

- History of previous surgery of affected shoulder.
- Systemic disease, severe degeneration (rheumatoid arthritis, osteoarthritis etc.) and malignancy in shoulder region.
- Trauma involving the shoulder.
- History of Pain due to disorder of cervical spine, elbow, wrist or hand.
- Neurological diseases such as stroke, or peripheral neuropathy that have already affected the activity of the shoulder.
- A history of drug allergy to lignocaine, bupivacaine.
- Pregnancy or lactation
- Received nerve block or local dilatation into the affected shoulder during the preceding four weeks.
- Patients who refuse to participate in study.

Sample size and randomization

Total 60 patients were divided randomly by computer generated random numbers obtained from www.random.org into 2 groups: Group A having 30 sample size (Mode of treatment: Hydrodilatation with normal saline) & Group B having 30 sample size (Mode of treatment: Suprascapular nerve block).

Materials used

1. Inj. Normal saline 50 c.c.
2. Inj. Lignocaine 2 c.c.
3. Inj. Bupivacaine 2 c.c.
4. Needle 20 gauge
5. Alcohol / Spirit

METHOD

Eligible patients fulfilling inclusion criteria approached and explained about nature and purpose of study. After obtaining informed consent and detailed history, patients were thoroughly examined. Thorough general and specific examination has been undertaken by the investigator and patient selected as per criteria and after randomization intervention was performed. For suprascapular nerve block, the patient was advised to seat with upper limbs hanging by the side of the body. After palpating anatomical parameters like clavicle, acromioclavicular joint, acromion process, scapular spine

and coracoid process, the entire area was sterilized with alcohol. For identifying spine of scapula, perpendicular line was drawn from the angle of the scapula upward to bisect the spine of the scapula. About 2 cm above and medial to the intersecting point, in the upper outer quadrant of scapula, the needle was inserted up to the hub of the needle or until the floor of the fossa was reached.

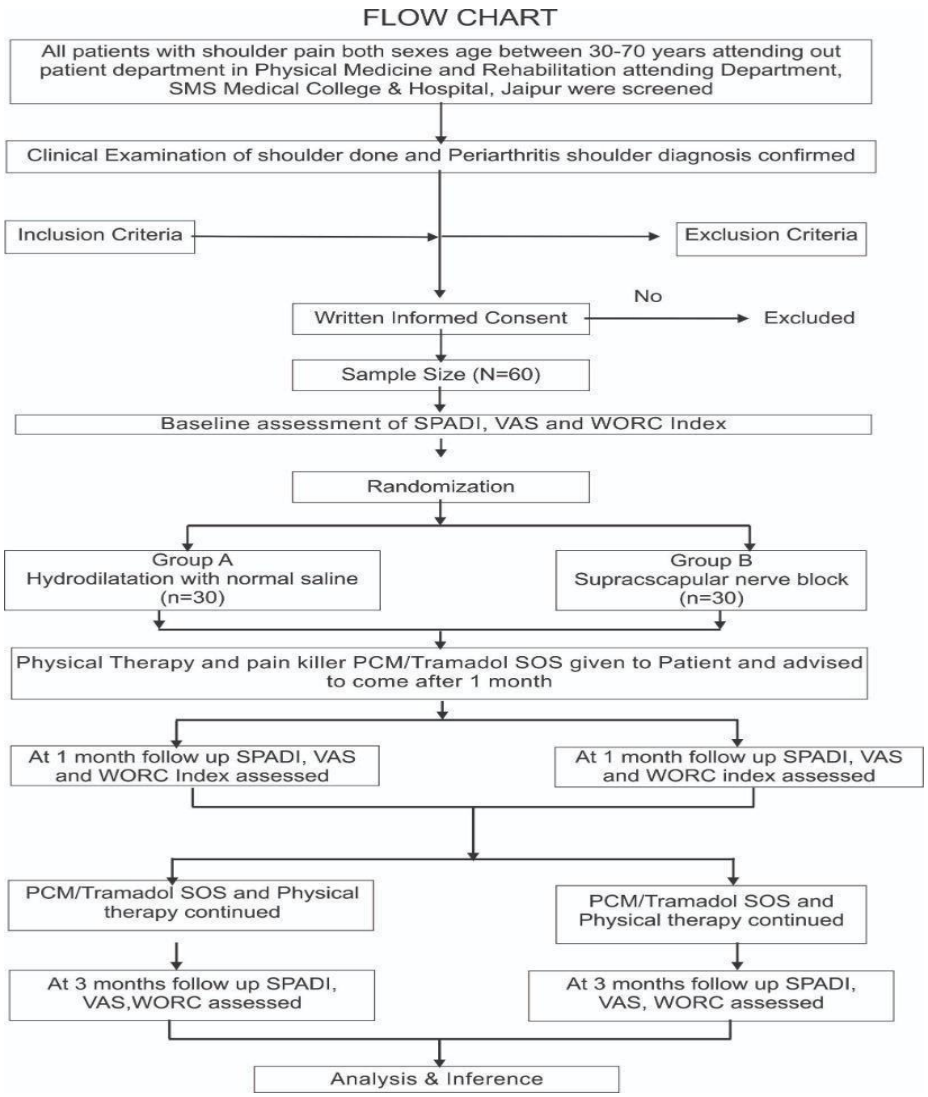
For hydrodilatation with normal saline, the posterior approach was used, in which patient was advised to seat with upper limbs hanging by the side of the body. After exposing upper back and front of affected shoulder, the area about 2 finger breadths inferior and 2 finger breadths to the posterior corner of the acromion process was sterilized with spirit or alcohol access. By using the thumb, deeply palpate the groove between the border of scapula and humeral head and afterwards insert the needle down to the capsule of joint.

Outcome Measures

1. The shoulder pain was assessed using pain score on Visual Analogue Scale (VAS) which was recorded by marking on 10 cm line that represents a continuum between "no pain" and "worst pain" What is the intensity of your pain?" which anchors of 0 (no pain) and 10 (most worst pain).
2. Shoulder pain specific functional impairment (disability) was accessed using the SPADI (Shoulder Pain and Disability Index) a validated outcome measure for shoulder pain measured as 0 to 10 (0= no pain, 10 = worst pain, imaginable) and as percentage representing higher disability levels and disability score 0-10 (0= no difficulty, 10 = so difficult it require help).
3. Quality of life was assessed using the WORC index.

Statistical Analysis

Nominal/ categorical variables were expressed as proportion while linear variables were expressed as mean and standard deviation. Ordinal variables have been shown as median and interquartile range. Chi square/ fisher-exact test was used for nominal/categorical variables whereas unpaired t-test was used for linear variables. Mann-Whiteney's U-test was used to analyze ordinal variables. P-value <0.05 has been considered statistically significant.



OBSERVATIONS AND RESULTS

Table 1: Age and Sex Distribution of the patients (Group A & B).

Age Group	Group A (30 Patients)				Total
	Male (15)		Female (15)		
	No. of Patients	Percentage (%)	No. of Patients	Percentage (%)	
30-40	4	13.33	0	0	4
41-50	3	10.00	7	23.33	10
51-60	7	23.33	5	16.66	12
61-70	1	3.33	3	10.00	4
Age Group	Group B (30 Patients)				Total
	Male (16)		Female (14)		
	No. of Patients	Percentage (%)	No. of Patients	Percentage (%)	
30-40	2	6.66	0	0	2
41-50	7	23.33	3	10.00	10
51-60	4	13.33	6	20.00	10
61-70	3	10.00	5	16.66	8

Table 2: Laterality Distribution.

Laterality	Group A (30 Patients)		Group B (30 Patients)	
	No. of Patients	Percentage (%)	No. of Patients	Percentage (%)
Right	12	40	15	50
Left	18	60	15	50

There was no patient with bilateral involvement in this study.

Table 3: Co morbidity Distribution.

Co morbidity	Group A (30 Patients)		Group B (30 Patients)	
	No. of Patients	Percentage (%)	No. of Patients	Percentage (%)
Hypothyroidism	0	0	2	6.66
Diabetic	3	10	3	10
Diabetic and Hypothyroidism	2	6.66	0	0
Non Diabetic and Non Hypothyroidism	25	83.33	25	83.33

In this series out of 60 patients 8 patients were diabetic. The most common associated disease with frozen shoulder is diabetes. According to literature it is also associated with high recurrence rate.

Group A and Group B

Movements		Group A (30 Patients)		Group B (30 Patients)		P value
		Mean	SD	Mean	SD	
Flexion	Baseline	107.33	19.46	112.33	16.55	0.288
	1st Month	127.5	18.68	140.38	13.71	**0.006**
	3rd month	144.46	17.71	153.65	15.4	**0.048**
Extension	Baseline	39.13	7.55	40.12	6.14	0.432
	1st Month	44.64	7.48	49.77	7.33	**0.014**
	3rd month	52.04	8.82	59.50	8.48	**0.003**
Abduction	Baseline	118.27	12.9	121.67	21.15	0.455
	1st Month	135.11	14.82	141.38	13.32	0.109
	3rd month	145.82	18.77	160.19	18.63	**0.007**
Internal rotation	Baseline	45	6.55	43.57	6.79	0.409
	1st Month	51.11	6.71	53.81	5.46	0.112
	3rd month	61.75	7.17	62.77	6.15	0.579
External rotation	Baseline	40.63	5.33	42.93	4.86	0.086
	1st Month	49.29	6.5	53	5.31	**0.026**
	3rd month	60.64	7.76	61.08	5.42	**0.012**

Average improvement in forward flexion from baseline to 1st month and 3rd month in group B is significant statistically (P = <0.05).

Group A

Movement	Period	Mean	Std. Deviation	P value
Flexion	**At baseline**	107.33	19.46	<0.001 (S)
	At 90 days	144.46	17.71	
Extension	**At baseline**	39.13	7.55	<0.001 (S)
	At 90 days	52.04	8.82	
Abduction	**At baseline**	118.27	12.9	<0.001 (S)
	At 90 days	145.82	18.77	
External rotation	**At baseline**	40.63	5.33	<0.001 (S)
	At 90 days	60.64	7.76	
Internal rotation	**At baseline**	45	6.55	<0.001 (S)
	At 90 days	61.75	7.17	

In group A average improvement of the intra group study in forward flexion, Extension, Abduction, External rotation, Internal rotation from baseline to 3rd month is significant statistically (P<0.05).

Table 89: Improvement.
Group B

Movement	Period	Mean	Std. Deviation	P value
Flexion	**At baseline**	112.33	16.55	<0.001 (S)
	At 90 days	153.65	15.4	
Extension	**At baseline**	43.83	6.14	<0.001 (S)
	At 90 days	59.5	8.48	
Abduction	**At baseline**	121.67	21.15	<0.001 (S)
	At 90 days	160.19	18.63	
External rotation	**At baseline**	42.93	4.86	<0.001 (S)
	At 90 days	61.08	5.42	
Internal rotation	**At baseline**	43.57	6.79	<0.001 (S)
	At 90 days	62.77	6.15	

In group B average improvement of the intra group study in forward flexion, Extension, Abduction, External rotation, Internal rotation from baseline to 3rd month is significant statistically (P<0.05).

VAS, SPADI and WORC Outcome Measures

Movements		Group A (30 Patients)		Group B (30 Patients)		P value
		Mean	SD	Mean	SD	
VAS	Baseline	6.07	1.31	5.9	1.09	0.595
	1st Month	4.07	1.18	3.92	1.02	0.625
	3rd month	2.54	1.17	2.27	1.22	0.416
SPADI	Baseline	61.77	8.5	59.27	8	0.246
	1st Month	34.62	15.42	28.87	10.47	0.117
	3rd month	29.05	12.68	15.85	10.53	**0.002**
WORC	Baseline	57.39	12.53	60.27	11.3	0.354
	1st Month	42.54	11.57	33.81	8.14	**0.001**
	3rd month	24.46	14.62	16.31	10.37	**0.01**

Average improvement in VAS Outcome measures from baseline to 1st month and 3rd month in group B is non-significant statistically (P>0.05)

Average improvement in SPADI Outcome measures from baseline to 3rd month in group B is significant statistically (P<0.05)

Average improvement in WORC Outcome measures from baseline to 1st month and 3rd month in group B is non-significant statistically (P<0.05).

DISCUSSION

Frozen shoulder is a disabling condition that causes restriction and pain in the shoulder joint. The term frozen shoulder was first introduced by Codman in 1934. He described a painful shoulder condition of insidious onset that was associated with stiffness and difficulty of sleeping on the affected side. Diagnosis of frozen shoulder usually depends on clinical basis with a painful stiff shoulder for at least 4 weeks, inability to use the affected arm with restriction of movement and loss of full function, pain at night causing sleep disturbance and inability to lie on the affected side. Frozen shoulder can be a primary or idiopathic disease or may be associated with many other systemic diseases, such as diabetes mellitus, hyper hypothyroidism, hypoadrenalism.

Parkinson's disease, cardiac disease, pulmonary disease, stroke etc. The incidence of frozen shoulder in diabetes patients is reported to be 10% – 36% and this disease is often more severe and is more resistant to treatment in this subgroup of patients. Although there are many treatment modalities, such as nonsteroidal anti-inflammatory drugs, physical therapy, intraarticular steroid injections, SSNB, hydrodilatation, manipulation under general anaesthesia, and arthroscopic capsular release. The suprascapular nerve supplies sensory fibres to about 70% of the shoulder joint including the superior and posterosuperior regions of the shoulder joint and capsule and acromioclavicular joints.[7,8,9] Due to the potential physiological benefits of distending contracted shoulder joints, capsular distension has long been used as a treatment for frozen shoulder.[10] Intra-articular fluid infusion has been reported to invoke capsular stiffness and a steeply rising pressure, indicating poor compliance of the joint capsule; this is recognized as the predominant feature of frozen shoulder.[11,12]

Hydrodilatation of the glenohumeral joint with normal saline decreases intra- articular pressure and increases the shoulder volume capacity. The aim of this study was to compare the effectiveness of suprascapular nerve block v/s hydrodilatation of glenohumeral joint both along with physiotherapy in patients with periarthritis shoulder pain and to assess the effectiveness of these methods for relieving pain, improvement in the ROM of the shoulder and shoulder specific quality of life. The exact mechanism of suprascapular nerve block is still unknown. Pain relief from the block extends the pharmacological effects of the drug. Decrease in central sensitization of dorsal horn nociceptive neurons or ''wind down'' theories have been suggested. A decrease in algogenic substance and direct infiltration of supraspinatus muscle has been suggested as possible contributing factors (Shanahan et al.2003). Some authors have suggested that delivering the solution in the suprascapular fossa is effective enough for nerve block but Karatas and Meray et al. (2002) observed that nerve block close to the nerve is more effective in their study.[13] Gam et al. (2016) demonstrated an increase in shoulder ROM in the HD group compared with the findings in the steroid injection group.[14]

The hydrodilatation procedure is a high volume non-surgical intra articular injection of normal saline with or without corticosteroid. The proposed mechanism of action is the mechanical distention of the joint space, ideally rupturing the tight, fibrotic joint capsule that develop during adhesive capsulitis (Haughton, DN, Barton, et al (2013).[15] Buchbinder et al., Bulgen et al, Rizk T.E and Christopher et al. (1983); Leffert et al. (1988) demonstrated that Frozen shoulder is considered to be a disease of middle age people of the 4th to 7th decade. It generally affects women, and non- dominant shoulders are affected frequently and also occurs bilaterally in as many as 34% of patients.[16,17,18,19,20] In the study of A. Taskaynatan et al. (2005) the average age of patients recorded was 53.75 years. They recorded 36.66% and 40% in the steroid and suprascapular nerve block group respectively were female in their study.[21] D. S. Jone and C. Chattopadhyay et al. (1998) recorded an average age of 53 years in intra intraarticular injection group and 60 years in suprascapular nerve block. In our study the average age of patients in the SSNB group was 50.4 years and in the HD group was 54.16 years, which is almost similar to previous studies.[22] Generally shoulder pain affects women more than men. M. Waldburger et al. (1992) in a study found that 63.3% of the females were affected.[23] Study by R. K. Sharma et al., R. A. Bajecal et al. (1993) recorded that 46% were female.[24] E. M. Shanhan et al. (2003) found that 46.42% females were affected. In our study the affected population consisted of females with 50% in the SSNB group and 46.66% in the HD group which is in agreement with the studies stated above. M. Weber and J. Prim et al. (1995) recorded that shoulder pain was more frequent at the left side (51.1%) than at the right (37.3%) and 11.6% at both sides in their study.[25] In study of R.K. Sharma, R. A. Bajecal et al. (1993) they reported that the nondominant shoulder was affected in 78% patients with no bilateral affection. M.K. Taskaynatan et al. (2005) recorded that affection of dominant shoulder was found in 56.6% in steroid inj. Group and 63% in suprascapular nerve block group in their study. In our study the left shoulder (55%) was affected more than the right shoulder with no bilateral affection. Non-dominant shoulders were affected more.

The relationship between diabetic and frozen shoulder is well documented by Bridgman et al. (1972); Lequesne et al. (1977); Fisher et al.(1986); Pal et al. (1986).[26,27,28,29] Diabetic patients have a 10-20% incidence of frozen shoulder and this rises to 36% in insulin dependent diabetics (Janda and Hawkins et al 1993). In the study of B. Shaffer et al (1992) 3 out of 62 patients were diabetic.[30] Ali T. Aldhafeeri et al. (2021) concluded hypothyroidism prevalence rate of 13.2% among all 91

confirmed frozen shoulders in their study.[31] Marcio Schiefer et al. (2016) recorded that 27.2% was hypothyroidism among all FS patients.[32] Ritwika Mallik et.al.(2015) observed 14.5% frozen shoulders were associated with hypothyroidism in their study.[33,34,35] In our study 6 out of 60 were associated with diabetes and 4 out of 60 with hypothyroidism. E. M. Shanahan et al (2003) excluded patients with a known allergy to the injecting agents, severe chronic airway disease, or cardiac failure. C. Eyigor et al (2009) excluded patients with inflammatory arthritis, active synovitis, h/o shoulder surgery, h/o nerve block to the shoulder, intra articular injection within last 3 month, trauma, rotator cuff tear, very severe pain, shoulder instability, advance osteoarthritis, referred pain in shoulders, neurological impairment, severe cognitive impairment, unstable chronic or terminal illness, severe musculoskeletal impairment in their study.[36]

Mehmet Ali Taşkaynatan et al. (2005) excluded patients with degenerative shoulder pathology in X-ray and those known to have cervical disc pathology, systemic rheumatism, malignancy, stroke, polyneuropathy, carpal tunnel syndrome, mental problem, contraindication to steroid injection, known lidocaine allergy, deformities of joints in the affected upper limb and trauma in previous 4 weeks in their study. In our study we excluded patients with History of any intervention related to shoulder pathology, Systemic disease, severe degeneration (rheumatoid arthritis, osteoarthritis etc.) and malignancy in shoulder region, Trauma involving the shoulder, History of Pain due to disorder of cervical spine, elbow, wrist or hand, Neurological diseases such as stroke, or peripheral neuropathy that have already affected the activity of the shoulder, A history of drug allergy to lignocaine, bupivacaine, Pregnancy or lactation. Mehmet Ali Taşkaynatan et al (2005), measured flexion, abduction, external rotation of painful shoulder with goniometer in their study. In our study we also measured flexion, abduction, ext. Rotation with goniometer. In most studies done previously, the initial average ROM of abduction was ~100°.

Henricus M Vermeulen, Piet M Rozing et al.[61] (2006) found active abduction ≤75°. M. Waldburger et al.[62] (1992) included patients with ≤70° of abduction in the affected shoulder in their study. M.A. Taskaynatan et al.(2005) found average improvement in flexion base line 130° to 143° in intra articular group (P<0.05) and 126° to 136° in suprascapular nerve Group (P<0.05) which was significant in their study. D.S. Jones and Chattopadyay et al. (1999) found improvement in abduction from baseline 90° to 170° in intra articular injection group and 100° to 170° in suprascapular nerve block in their study. In our study we found average improvement in abduction from baseline 118.27° to 145.82°at 90 days in suprascapular nerve block group (p value <0.001) and 121.67° to 160.19°in hydrodilatation group which was highly statistically significant (p value<0.001). But comparing between both groups we found improvement in abduction in hydrodilatation group at 3rd month was statistically significant (p value <0.05). D.S. Jones and Chattopadyay et al. (1999) found improvement in external rotation from base line 20° to 70° in intra articular injection group and 30° to 80° in suprascapular nerve block in their study.

Jong pil Yoon et al.[63] (2016) found that in Hydrodilatation Group improvement in external rotation 36° to 44° compared to intra articular and subacromial groups which was greater than these groups. M.A. et al.(2005) found average improvement in external rotation base line 76° to 79° in intra articular group (p value< 0.001) and 74° to 76° in suprascapular nerve Group (p value< 0.001) which was highly significant in their study. In our study we found average improvement in external rotation from baseline 40.63° to 56.64°at 3rd month in suprascapular nerve block group (P>0.05) and 42.93° to 61.08° in hydrodilatation group(P<0.05) which was statistically significant. But comparing between both groups we found improvement in external rotation in hydrodilatation group at 3rd month was statistically significant (p value <0.05). Jong pil Yoon et al. (2016) found that in HD Group improvement in flexion 148° to 156° compared to intra-articular and subacromial groups which was greater than these groups. In our study we found average improvement in flexion from baseline 107.33° to 144.46° in suprascapular nerve block group (p value <0.001) and 112.33° to 153.65° in hydrodilatation group(p value<0.001) which was highly statistically significant.

But comparing between both groups we found improvement in flexion in hydrodilatation group at 3rd month was statistically significant (p value <0.05). So in intra-group study showed that all ranges of motion (flexion, abduction, extension, external, rotation, internal rotation) from baseline to final followup, in both SSNBs Group and HD Group improved significantly as p value was (<0.05). But in inter group study flexion, abduction, extension, and external rotation were more significantly improved in the HD group than in the SSNB group (<0.05). There are number of scoring tests for shoulder pain and dysfunction but most validated scoring system is SPADI (Shoulder Pain and Disability Index) which was used in most of the previous studies. SPADI scoring system consists of two self-reported subscale of pain and disability. The items of both subscales are visual analogue scales (VAS). In newer studies SPADI score was considered, as it was developed by Roach et al. (1991) for evaluation of pain and disability of the patient with shoulder pain. This score is considered as most authentic score by most of the people as it includes 13 different questionnaires related to pain and disability for functional assessment in shoulder pain. Severity can be measured proportionally with the score. In our study, the initial average total SPADI score in the SSNB group was 61.77 and in the Hydrodilatation group was 59.27 which is similar to Simon Carrette et al. (2003) 69.16, E.M. Shanahan et al. (2003) 68.1, R. Buchbinder et al. (2007).

In our study we found average improvement in SPADI from baseline 61.77 to 29.05 in the suprascapular nerve block group and 59.27 to 15.85 in the hydrodilatation group which was statistically significant in later group(p value <0.05).

The Visual Analogue Scale (VAS) consists of a straight line with the endpoints defining extreme limits such as 'no pain at all' and 'pain as bad as it could be'. The patient is asked to mark his pain level on the line between the two endpoints. The distance between 'no pain at all' and the mark then defines the subject's pain. This tool was first used in psychology by Freyd in 1923. The VAS appears to be more reliable for current pain than remembered pains. We used the VAS scale for shoulder pain. Seung-Hyun-Yoon et al conducted a study in 2013 that showed improvement in VAS score for the low and high dose group. In the present study, there was no significant difference observed among the groups. We found average improvement in VAS from baseline 6.07 to 2.54 in the suprascapular nerve block group and 5.9 to 2.27 in the hydrodilatation group which was statistically insignificant.

The Western Ontario Rotator Cuff (WORC) Index is a questionnaire that was purposely developed to help understand the particular signs, symptoms, and functional limitations associated with an RC tendinopathy. The WORC relies on patient selfreporting and consists of 21 questions grouped into five categories: physical symptoms, sports/recreation, work, lifestyle and emotions. It is an Outcome Measure used by clinicians to evaluate the condition of individuals affected by this pathology. It can help establish goals, prognostic indicators, and an overall rehabilitation plan for individuals affected by an RC tendinopathy. The WORC Index is highly reliable and has an excellent test-retest reliability (intraclass correlation coefficient) ranging from 0.85-0.99.

We used WORC Index to assess quality of life affected by periarthritis of the shoulder. Selections of these three scales were used for better comparison of both the modalities.

In our study we found average improvement in WORC index from baseline 57.39 to 24.46 in the suprascapular nerve block group and 60.27 to 16.31 in the hydrodilatation group which was statistically highly significant in the hydrodilatation (P value was <0.001).

CONCLUSION

Suprascapular nerve block and hydrodilatation, both are effective for Adhesive Capsulitis. Remarkable improvement in pain and range of motion was observed in both the groups. Hydrodilatation is a simple, cost-effective procedure; it causes breaking of adhesions and eventual rupture of capsule thus improving the range of motion and functional capacity of the shoulder joint.

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