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Comparison of suprascapular block with physiotherapy for the treatment of adhesive capsulitis of shoulder

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Abstract
Frozen shoulder or adhesive capsulitis, is a common problem in general practice presenting as pain that may be severe, accompanied by a progressive loss of movements resulting in a loss of function.In 1934 Codman introduced the term "frozen shoulder", stating that it was characterized by insidious onset, pain near the insertion of the deltoid, inability to sleep on the affected side, painful and restricted elevation and external rotation, but normal radiological appearance. Later in 1945, based upon his findings of synovial changes in the glenohumeral joint, Neviaser introduced the term "adhesive capsulitis"
Methodology: This present observational study was carried out in SKIMS Medical College Hospital, Bemina, Srinagar from November 2020 to June 2022. A total of 50 patients with adhesive capsulitis of shoulder were included in the study. Ethical clearance was obtained from Institutional Ethical Committee and proper informed consent was taken from all patients. Patients were explained in detail about the procedure and need for follow up. Diagnosis of adhesive capsulitis was made clinically and/or on imaging.Each participant in the research provided written informed permission. SPSS Version 20 was used to analyze the data.
Result: The present study was conducted on 50 patients equally distributed in two groups. Group A (SSNB, n=25) and Group B (Physiotherapy, n=25).Patients in Group A aged between 40-59 years with a mean age of 50.2+5.37 years while the age of the patients in Group B ranged between 40-58 years with a mean age of 49.9+5.31 years. The mean duration of illness was 4.79+2.041 months in Group A patients compared to 4.84+2.095 months in Group B patients with an insignificant statistical difference (p 0.946). Pre intervention range of motion (ROM) was compared and the relation was found to be statistically insignificant ($p > 0.05$). Mean abduction in Group A was 70.6+15.43 compared to Group B mean of 70.8+15.05. Mean internal rotation in Group A was 34.2+8.25 against 33.8+8.20 in Group B while mean external rotation in Group A was 23.1+8.28 as compared to 22.6+8.43 in Group B. Mean post intervention abduction at 1 week was 84.2+16.74 in Group A and 85.0+16.33 in Group B. At 4 weeks, mean abduction was 97.6+16.46 and 97.2+16.14 in Group, respectively while mean abduction at 12 weeks was 108.4+13.60 in Group A against 108.2+13.68 in Group B. Mean post intervention internal rotation at 1 week was 37.4+8.05 in Group A and 37.2+7.65 in Group B. At 4 weeks, mean internal rotation was 45.0+8.16 and 44.8+7.70 in Group, B respectively while mean internal rotation at 12 weeks was 53.6+9.30 in Group A against 53.0+8.90 in Group B.
Conclusion: The current study supports that suprascapular nerve block is a safe and well-tolerated method. Physiotherapy was found to be effective in reducing pain severity and functional disability, and the addition of suprascapular nerve block to physiotherapy improved functional status and pain levels in patients with adhesive capsulitis.

Keywords: Suprascapular block, physiotherapy, adhesive capsulitis

Introduction
Adhesive capsulitis occurs in 2-5% of the general population and up to 20% in diabetic patients.5 It occurs more commonly in women between 40 and 60 years and in a quarter of the patients the disease is bilateral. The pathophysiology of adhesive capsulitis is not clear. It starts without a specific precipitating event, as an inflammatory reaction in the shoulder capsule. The presence of cytokines is evidence of a possible autoimmune process, which however has not established relations.6 After active fibroblastic proliferation in the shoulder capsule, fibroblasts start transforming to myofibroblasts causing inflammatory contracture, capsular hyperplasia and fibrosis reducing the capsular volume and restricting the glenohumeral movements. 7 Frozen shoulder is typically characterised as having three clinical

overlapping phases:8 Phase 1, in which there is progressive stiffening and loss of motion in the shoulder with increasing pain on movement, which may be worse at night (months 2–9), usually referred to as the painful phase. Phase 2, in which there is a gradual decrease in pain but stiffness remains and there is considerable restriction in the range of movement (months 4–12), usually referred to as the stiffening or 'freezing' phase. Phase 3, in which there is an improvement in range of movement (months 12–42), usually referred to as the resolution phase. Many physical therapy and home exercises can be used as a first-line treatment for adhesive capsulitis.24 Physical therapy has been shown to bring about pain relief and return of functional motion.25 Suprascapular block is meant to reduce pain severity and functional disability and hence improves quality of life of the patients with adhesive capsulitis.26,27 Suprascapular nerve block is also preferred over other therapeutic options such as anti-inflammatory drugs and intra-articular steroid injections, especially in elderly population who have many co-morbidities such as diabetes as suprascapular block has lesser side effects.

Need of the Study

Duplay is considered to be the first one who described in 1872, a painful, stiffening condition of the shoulder, which he termed "périarthrite scapulo-humérale".29 He suggested manipulation under anesthesia as its treatment. The term "frozen shoulder" was first used by Codman in 1934 [2]. Suprascapular nerve block was initially described by Wertheim and Rovenstein in 1941.31. They applied it in patients with chronic shoulder pain, although diagnosis had not been made. Neviaser in 1945 [3] noted that the pathology of frozen shoulder was actually located at the capsule of the shoulder joint and therefore called it "adhesive capsulitis". Arthrographic distension of the shoulder capsule leading to capsular rupture was first described by Anderson and Lundberg in 1965. Conducted a study to examine the efficacy of SSNB for the management of adhesive capsulitis. Participants who received the SSNB reduced the duration of their symptoms of adhesive capsulitis by an average of 6 months vs 11.2 months in the placebo group. They also had reduced pain scores, improved range of movement and lower SPADI scores compared with the placebo group across all time points. SSNB reduced the duration of adhesive capsulitis and resulted in improved pain and disability experience for patients. This present observational study was carried out in SKIMS Medical College Hospital, Bemina, Srinagar from November 2020 to June 2022. A total of 50 patients with adhesive capsulitis of shoulder were included in the study This study was conducted to assess the functional outcome of suprascapular nerve block and physiotherapy in adhesive capsulitis of shoulder.

Aim of the Study

Comparison of suprascapular block with physiotherapy for the treatment of adhesive capsulitis of shoulder.

Methodology

This present observational study was carried out in SKIMS Medical College Hospital, Bemina, Srinagar from November 2020 to June 2022. A total of 50 patients with adhesive capsulitis of shoulder were included in the study. Ethical clearance was obtained from Institutional Ethical Committee and proper informed consent was taken from all patients. Patients were explained in detail about the procedure and need for follow up. Diagnosis of adhesive capsulitis was made clinically and/or on imaging.Each participant in the research provided written informed permission. SPSS Version 20 was used to analyze the data. inclusion criteria of the study are all sexes, age 20-60 years ,clinically confirmed case with duration of symptoms 4weeks to 12 months ,restricted rom of shoulder [abduction less than 100degree, ,external rotation of less than 50 degree and internal rotation of ,less than 70 degree] ,pain at night causing sleep disturbances. exclusion criteria are complicated DM, previous intra-articular injection, any contraindications to local anaesthetics, evidence of alternate cause of shoulder pain recent trauma to shoulder The recorded data was compiled and entered in a spreadsheet (Microsoft Excel) and then exported to data editor of SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as Mean±SD and categorical variables were summarized as frequencies and percentages. Graphically the data was presented by bar and pie diagrams. Student's independent t-test or Mann-Whitney U-test, whichever feasible, was employed for comparing continuous variables. Chi-square test or Fisher's exact test, whichever appropriate, was applied for comparing categorical variables. A P-value of less than 0.05 was considered statistically significant.

Results

Table 1: Comparison based on post intervention external rotation at various intervals of time in two groups

Time Interval	Group A		Group B		P-value
	Mean	SD	Mean	SD	
1 Week	27.4	8.05	27.0	8.04	0.861
4 Weeks	32.4	8.05	32.0	8.04	0.861
12 Weeks	37.8	8.18	37.2	8.43	0.799

There was statistically insignificant difference between post intervention external rotation at various time interval and group study groups with a p value of >0.05. Mean post intervention external rotation at 1 week was 27.4±8.05 in Group A and 27.0±8.94 in Group B. At 4 weeks, mean external rotation was 32.4±8.05 and 32.0±8.04 in Group B respectively while mean external rotation at 12 weeks was 37.8±8.18 in Group A against 37.2±8.43 in Group B.

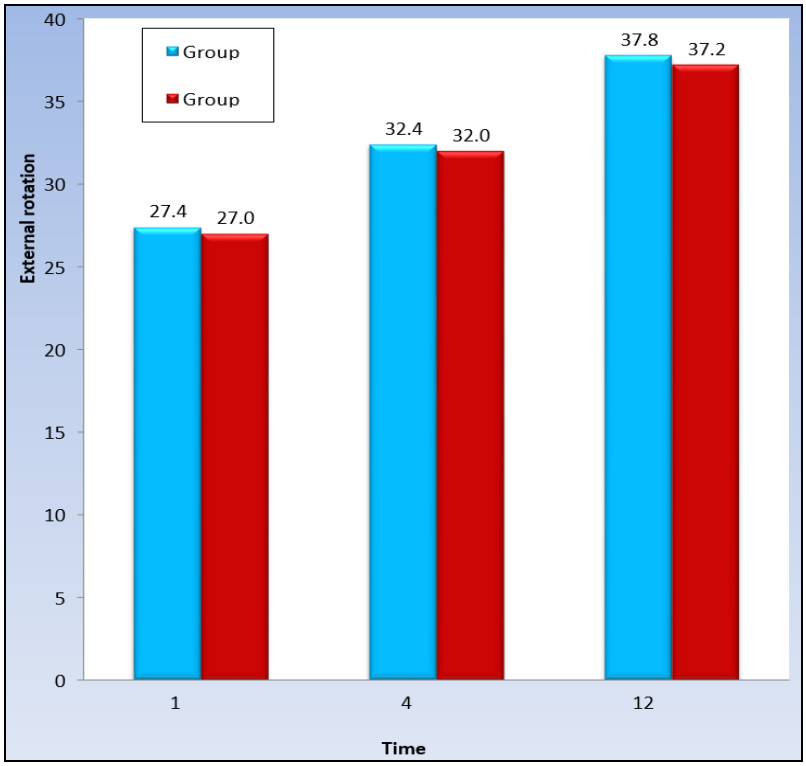

Fig 1: Post intervention external rotation at various intervals of time

Table 2: Comparison based on post intervention SPADI at various intervals of time in two groups

Time Interval	Group A		Group B		P-value
	Mean	SD	Mean	SD	
1 Week	53.62	5.38	53.65	5.37	0.984
4 Weeks	44.55	5.12	44.62	5.10	0.961
12 Weeks	38.02	5.22	38.05	5.21	0.983

Comparison based on post intervention SPADI at various time intervals in two groups was done and found to be statistically insignificant ($p > 0.05$). At 1st week mean post intervention SPADI was 53.62±5.38 and 53.65±5.37 in Group A and Group B respectively. At week 4, mean post intervention SPADI was 44.55±5.12 in Group A and 44.62±5.10 in Group B, while the SPADI at week 12 was 38.02±5.22 in Group A and 38.05±5.21 in Group B.

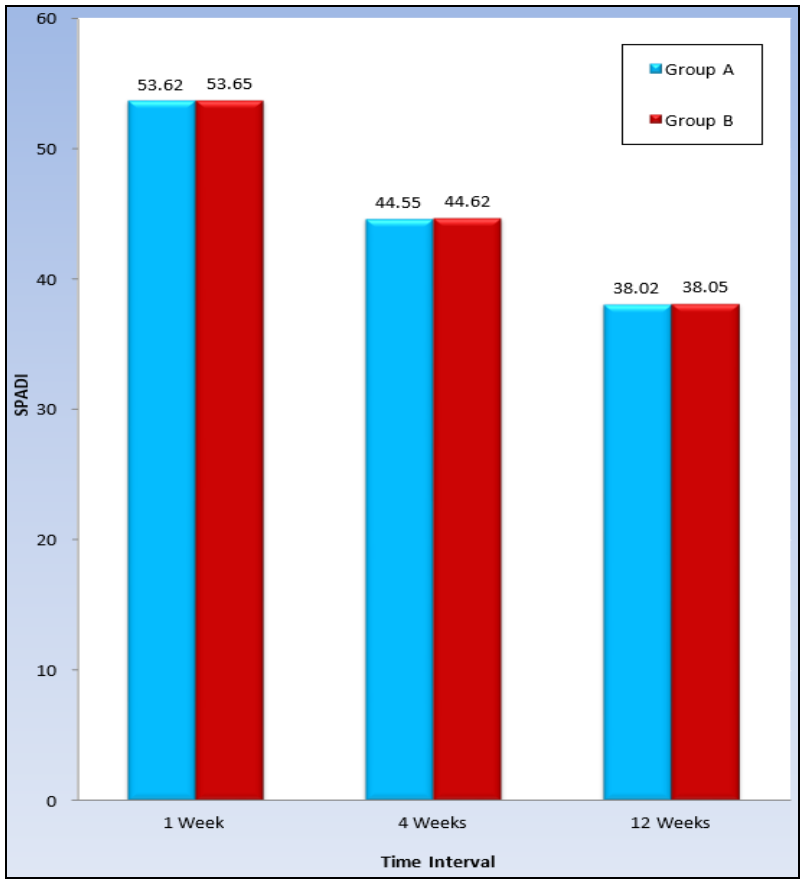

Fig 2: Post intervention SPADI at various intervals of time in two groups

Discussion

Shoulder complaint is the third most common musculoskeletal problem with 6.7%–66.7% lifetime prevalence49, whereas adhesive capsulitis (AC) of shoulder is the most common cause of shoulder pain in India50. The American Shoulder and Elbow Surgeons defines AC as "a condition of uncertain etiology characterized by significant restriction of both active and passive shoulder motion that occurs in the absence of a known intrinsic shoulder disorder." The most frequent systemic predisposing factor causing AC is diabetes mellitus with a prevalence of 20% in India. Did a study on 41 patients with adhesive capsulitis. Patients were randomly assigned to the injection group (n = 19) or PT-alone control group (n = 22).The mean age was 55.05 yrs in Injection group (IG) and 61.82 yrs in the control group (CG). There were 31 females and 10 males in both groups were comparable in their sex ratio. Parashar A *et al*., (2021) [11] 47 did a study in which the age of the patients ranged between 45 and 70 years. Mean age of the patients in Group 1 (NIR) was 57.90 years and in Group 2 (SSNB + NIR) was 57.20 years. There were 35 females and 25 males and all 3 groups were comparable in their sex ratio. 70 percent of the study group had leftsided shoulder involvement. Verma DK et al., (2019) [12] did a study on 120 patients with a mean age of 52.90+8.65 years with a range of 39-72 years with a statistically insignificant difference ($p > 0.05$). There were 34 females and 36 males with 52% patients having right shoulder involvement against 47% left shoulder involvement. In the present study, the mean duration of illness was 4.79+2.041 months in Group A patients compared to 4.84+2.095 months in Group B patients with an insignificant statistical difference (p 0.946). Similar results were obtained by Sonune SP *et al*., (2016) where in the average duration of disease was between 1 to 5 months.

Conclusion

The current study supports that suprascapular nerve block is a safe and well-tolerated method. Physiotherapy was found to be effective in reducing pain severity and functional disability, and the addition of suprascapular nerve block to physiotherapy improved functional status and pain levels in patients with adhesive capsulitis. Mean post intervention external rotation at 1 week was 27.4+8.05 in Group A and 27.0+8.94 in Group B. At 4 weeks, mean external rotation was 32.4+8.05 and 32.0+8.04 in Group A and Group B respectively while mean external rotation at 12 weeks was 37.8+8.18 in Group A against 37.2+8.43 in Group B. Comparison based on post intervention SPADI at various time intervals in two groups was done and found to be statistically insignificant ($p > 0.05$). At 1st week mean post intervention SPADI was 53.62+5.38 and 53.65+5.37 in Group A and Group B respectively. At week 4, mean post intervention SPADI was 44.55+5.12 in Group A and 44.62+5.10 in Group B, while the SPADI at week 12 was 38.02+5.22 in Group A and 38.05+5.21 in Group B.

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Conflict of interest

There are no conflicts of interest.

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