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Original Research Article

A Prospective Randomized Comparison Study in Patients with Frozen Shoulder Treated by Manipulation under Anesthesia with or Without Intra-Articular Steroid Injection

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Abstract:

Background: Periarthritis shoulder is a common condition characterized by shoulder pain and reduction of range of motion. It is frequently associated with significant morbidity hampering routine activities and disturbed sleep. The various treatment options available include simple physiotherapy, intra articular injections, manipulation under general anesthesia and surgical intervention. This study was undertaken to compare the functional outcome in patients with frozen shoulder treated by manipulation under anesthesia with or without intra-articular steroid injection.

Materials and Methods: Sixty-four patients with periarthritis shoulder were randomly allocated into two groups. Group A receiving manipulation under anesthesia with intra-articular steroid injection and Group B receiving manipulation under anesthesia without intra-articular steroid injection. Patients were followed up for two years from the start of treatment. Patients was assessed using Constant Murley scores before treatment and at every visit. Results were assessed using SPSS and Microsoft Excel.

Results: Manipulation under anesthesia both with and without intra-articular injections of corticosteroids is beneficial in the treatment of periarthritis shoulder. Manipulation along with intra-articular triamcinolone infiltration are more effective if performed early in the course of the disease.

Conclusion: Manipulation under anesthesia with and without intra-articular steroid infiltration is an efficient treatment with a good functional outcome in the treatment of periarthritis shoulder.

Level of study: Level 1; Randomized controlled trial, therapeutic study.

Keywords: Frozen Shoulder, Adhesive Capsulitis, Manipulation Under Anesthesia, Intra-Articular Steroid Injection.

Introduction:

Frozen shoulder also known as periarthritis shoulder or adhesive capsule it is of shoulder, is a common cause of shoulder pain and stiffness, frequently accompanied by disturbed sleep and disability to work. Frozen shoulder is defined by the American Academy of Orthopaedic Surgeons as, ‘‘A condition of varying severity characterized by the gradual development of global limitation of active and passive shoulder motion where radiographic findings other than osteopenia are absent.”. [1] It is a self-resolving condition and resolves over 2-3 years, only a few cases rarely persists beyond 3 years [2]. Despite the self-limiting nature of this condition, severe pain and restricted movements frequently make waiting for spontaneous resolution difficult. The various treatment options available include simple physiotherapy [3], intra articular injections [4], manipulation

under general anesthesia [5,6,7] and surgical intervention (arthroscopic and open athrolysis). [2] The optimum method of treatment continues to be a

source of controversy. The potential benefit of addition of intra-articular steroid to manipulation under anesthesia is unclear. Hence this study was under taken to compare the functional outcome of manipulation under anesthesia with or without intraarticular cortisone injection in patients with frozen shoulder.

Materials and Method:

Sixty-four periarthritis of shoulder patients attending out-patient department of Assam Medical College and Hospital, Dibrugarh who met the inclusion and exclusion criteria were included in the study. Ethical clearance was obtained from the Institutional Ethics Committee (Human) of Assam Medical College and Hospital, Dibrugarh. Inclusion Criteria are all patients with pain in the shoulder for at least one month, sleep disturbance due to night pain and inability to lie on the affected shoulder, restriction of all active and passive range of shoulder movements, with are duction in external rotation of at least 50%. Exclusion criteria includes patients with symptoms and signs arising from the cervical spine, cord and its roots, brachial plexus and its branches, patients with generalized arthritis, fractures and dislocation of the humerus, infective and tumorous lesions in and around the shoulder joint. Informed consent was taken prior to intervention. All patients detailed history was taken, assessed clinically and functionally using the Constant Murley scores. [8] Routine blood investigations, radiological and pre-anesthetic evaluation done. Patients were divided into two groups A and B after randomization. Quasi randomization was used, with the first case selected by lottery and subsequent cases alternatively allocated to these groups. Group A received manipulation under anesthesia with intra-articular steroid injection and Group B received manipulation under anesthesia. Preparation of triamcinolone injection – 1ml of 40 mg/ml of triamcinolone acetonide was diluted with 4 ml of 2% lignocaine solution. [9]

Procedure of manipulation: The patient lies supine on the OT table after he/she has been anesthetized. The technique begins with gradual forward elevation in the sagittal plane while the scapula is fixed. Passive external rotation performed at 0 degree of abduction, followed by external rotation at 90 degree of abduction. Lastly, internal rotation in 90 degree of abduction and cross body adduction are performed. [10]

Procedure of administration (Lateral approach): An 18-gauge needle is inserted about 0.5inch(1.3cm) below the tip of the acromion process. Advance the needle medially below the acromion process and horizontally and in a slightly posterior direction along the line of the supraspinatus fossa. The needle should slip into the joint completely without any resistance followed by injection of therapeutic agent. Physiotherapy was given from day 1 to continue shoulder mobilization exercises. He / She advised to do the following exercises: shoulder wheel, pulley exercises, pendulum exercise.

Patients were followed up and the range of movements were measured during every visit. Constant Murley score were also taken on each visit.

Outcome measures: Treatment outcome was measured using Constant Murley scores. The parameters were initially recorded before the intervention(baseline) and then after the intervention at3, 6, and 12 weeks, and then at 6,9, 12, 18, and 24 months. The outcome parameters in both the study groups were compared with each other. Any complications encountered in the study were also noted.

Statistical analysis: The statistical analysis of the data was performed using the computer program, Statistical Package for Social Sciences (SPSS for Windows, version 20.0.Chicago, SPSS Inc) and Microsoft Excel 2010. Results on continuous measurements are presented as mean +/- standard deviation are compared using Chi-square-t' test. Discrete data are expressed as number (percentage) and are analyzed using Chi- q F w w<5 0 P correlation coefficient (r) was used to measure the associations among continuous variables. For all analysis, the statistical significance was fixed at 5% level (p-value <0.05). Charts and bar diagrams were prepared using appropriate tools.

Results:

In the present study, the age of patients with Adhesive capsulitis ranged from 40 to 70 years. Peak incidence of the disease was seen in the 4th and 5th decade of life with 30% of the cases were in the age group of 40-49 years, 50% of the cases were in the age group of 50-59 years respectively. Mean age distribution of the patients was between 53 to 54 years (in both groups). Females (68.7%) were most commonly affected with frozen shoulder when compared to males (31.3%). In both the groups, female predominated (MUA group- 65.6% of females and in MUA + ISI group- 71.8% were females).The incidence of diabetes mellitus was 12.5% in both the group. In the study population, 72% of the participants were affected on the non-dominant shoulder, whereas 28 % of study population were affected on the dominant shoulder. In the MUA group, 30% and 70% of patients were affected on right and left shoulders, respectively. Similarly in MUA + ISI group, 25% and 75% of patients were affected on the right and left shoulders, respectively. The improvement of the functional outcome was seen in both the groups. Three weeks after the intervention, patients who received MUA plus ISI demonstrated greater improvement in terms of the Constant score and passive ROM. However, the mean Constant score at 12 weeks follow-up of group MUA +ISI, it was 80.20 and in

group MUA was 79.10% respectively. Thus present prospective study showed a significant improvement in the functional outcome in both the treatment groups from the pre procedure to the 12 weeks follow up.

Discussion:

The incidence of adhesive capsulitis is 3% in general population. An inflammatory synovitis coupled with contraction of joint capsule & its adherence to the head of the humerus causes this condition. The various treatment options available include simple physiotherapy, intra articular injections, manipulation under general anesthesia and surgical intervention. Triamcinolone acetonide being a long acting steroid is the commonly used intra articular injection which has anti-inflammatory and anti-fibrotic action. This study compares the functional outcome of manipulation under anesthesia with and without intra-articular steroid injection. In the present study the age of patients with periarthritis of the shoulders ranged from 40–70 years. Peak incidence of periarthritis of the shoulder was seen in the 4th and 5th decade of life. In MUA group and MUA + ISI treatment groups, the mean age distributions were 53.05 and 53.65. This was also in similarity with the study conducted by Goswami MI et al. [11], which showed the age group of 30–65 years in patients with adhesive capsulitis. In another study by Tato JP et al. [12], reported that adhesive capsulitis typically develops in the 40-60 year old age bracket. Among 64 patients included in the study, 44

(68.75%) were female and 20 (31.25%) were male. A total of 65.6 % of the females and 34.4 % of males were treated with manipulation under anesthesia. Further, manipulation under anesthesia with intraarticular steroid injection was given to 71.8 % of females and 28.2% of male patients. In a study by Goswami MI et al. [11] 2 showed 3:2 female: male relation which is comparable to our study. The functional outcome of the treatment was assessed by using Constant Murley score. The mean constant Murley score at 12 weeks follow up of group MUA+ISI, it was 80.20 and in group MUA was 79.10 respectively. Blanchard et al. [13] found greater improvement in pain, range of movement and shoulder disability in favour of corticosteroid injections in the short term (6 weeks) and, to a lesser extent, in the longer-term (up to 1 year). Roshan D (2019) [14] found comparable results, with a mean constant score of 42.10 ± 5.12 pre-procedure and 75.20 ± 6.13 post-procedure. Chengjun Song(2021) [15] observed that the patients receiving MUA plus ISI had less pain at 1 and 2 weeks after intervention, less disability at 2 weeks, and a greater increase in the ROM upon abduction at each subsequent visit. Overall, the results of current study support MUA as an effective and safe treatment of the frozen shoulder. Complications such as fracture of proximal humerus, brachial plexus injury, shoulder dislocation, post manipulation pain, hemarthrosis, tearing of the joint capsule or rotator cuff injury have been reported during MUA. In our study, we did not experience any complication of MUA shoulder. A small group of patients had no restricted movement during MUA. They needed no additional force for manipulation, showing movements restricted due to pain. This shows difficulty in diagnosis of adhesive capsulitis in normal clinical setting. Codman's observation in1934 of frozen shoulder being a condition "difficult to define, difficult to treat and difficult to explain from the point of view of pathology " In the end this study concludes that manipulation resulted in return of movements, but maintenance of movements over longer periods requires continuous shoulder physiotherapy and shoulder mobilization exercises.

Conclusion

In patients with periarthritis shoulder, MUA followed by immediate physiotherapy results in decreased shoulder pain and aided in good recovery of shoulder function. Intra-articular injection (Steroid + Lignocaine) during the procedure will result in Stretching of joint capsule, breaking of adhesions with good postoperative pain relief. This could help in start of physiotherapy at the earliest. Further MUA will result in breaking of remaining adhesion and return of movements.

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