Section: Anaesthesiology

Original Research Article

A COMPARATIVE STUDY OF STEROID INJECTION WITH OR WITHOUT LIGNOCAINE IN TREATING FROZEN SHOULDER

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Received : 04/01/2024
Received in revised form : 01/02/2024
Accepted : 16/02/2024

Keywords:
Frozen shoulder, pain, range of movement, methylprednisolone, lignocaine.

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DOI: 10.47009/jamp.2024.6.1.381

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2024; 6 (1); 1923-1926

Abstract

Background: Frozen shoulder is due to stiffness of glenohumeral joint which is extremly painful condition. intraarticular injection of methylprednisolone with lignocaine **Materials and Methods:** Total 112 patients were randomly divided in 2 equal groups: In Group A patients were injected 2 ml (80 mg) of methylprednisolone and 3 ml of 1% lignocaine and in Group B patients were injected with 2 ml (80 mg) of methylprednisolone and 3 ml of distilled water in the affected shoulder joint. After that half an hour of standard shoulder range of movement exercise regimen was performed under supervision. **Result:** The mean visual analogue score for pain and shoulder pain and disability index were lower in Group A in comparison to Group B after half hour of drug injection, at the end of first week, at the end of third week and at the end of six week. All the parameters of range of movement were improved in Group A more then Group B after half hour of drug injection, at the end of first week, at the end of third week and at the end of six week. **Conclusion:** Injection of methylprednisolone and lignocaine in the frozen shoulder joint can be a non-invasive, rapid safe and simple analgesic technique which reduces pain and impove the range of movement in shouder joint.

INTRODUCTION

Frozen shoulder is a common term for painful stiffness of the glenohumeral joint, which is characterised by shoulder pain lasting longer than four weeks and a minimum of 50% loss in glenohumeral movement in all directions.[1] Frozen shoulder is also known as periarthritis shoulder and adhesive capsulitis. Incidence of adhesive capsulitis ranges from 3% to 5% in the general population and can reach 20% in diabetics.[2]

Recovery from frozen shoulder has always been thought to be "always sure and may be confidently expected".[3] Numerous researchers employing diverse therapeutic approaches have documented that a significant proportion of impacted individuals get whole or almost total alleviation of symptoms in addition to a full range of shoulder motion.[3-6] Nevertheless, several researchers cast doubt on these sanguine results, noting quantifiable limitations in 39–76% of the patients at the time of follow-up and enduring symptoms in as many as 45% of them.[7-9]

Numerous therapeutic approaches have been studied, such as stellate ganglion block,[10-12] physiotherapy,[13] infiltration brisement, radiation,[14] supra-scapular nerve block,[10] manipulation under general anaesthesia (MUA),[11] local or oral steroids,[8] and so on. There isn't a consensus regarding the best type of treatment, as different treatments have different effects in different sequences. Finding a safe, affordable method to lower the condition's morbidity is crucial for developing nations.[15]

In this study, we aimed to examine the effects of two different frozen shoulder therapy modalities—using distilled water alone or an intraarticular injection of methylprednisolone combined with lignocaine—on measures including pain and range of motion without the use of sonography or fluoroscopy.

MATERIALS AND METHODS

After obtaining approval by the ethics committee, we included 112 patients of 3rd to 7th decade who were coming for treatment of spontaneous onset of painful stiff shoulder with restriction of range of movement around shoulder (Ext.-Int. rotation, flexion-extension, abduction- adduction) either all three or any two, without any obvious cause, with normal AP and lateral x-ray view, visual analogue score (VAS) greater than 5 and Shoulder pain and disability index (SPADI) score greater than 50%. Patients with pathology of glenohumeral joint, significant cervical spine disease, history of trauma of shoulder, local

ISSN (O): 2687-5365; ISSN (P): 2753-6556

steroid injection in previous three months, physiotherapy of affected shoulder in last three months, cerebral vascular accident, inflammatory joint disease of shoulder, bilateral frozen shoulder, thyroid disease, coronary artery bypass, prior surgery of affected shoulder, allergy to lignocaine, medical condition like coagulation disorders, diabetes and local infections were excluded.

In this study patients were randomly divided by chit in box method into 2 groups. These procedures were carried out in operation theatre, so that monitoring can be easily done. After taking written and informed consent, patient was taken on the operation table. Patient was positioned in sitting position with back straight and arms on opposite shoulder. Under all aseptic precautions posterior approach was used to inject drug in glenohumeral joint. This portal was located 2 to 3 cm inferior and 1 cm medial to the posterolateral tip of the acromion. At this site the attempt was made to pass through the posterior soft spot between the infraspinatus and teres minor muscles. A 26-gauge 1.5-inch needle was inserted in this site with tip pointing towards coracoids process anteriorly. The index and middle finger were placed on the coracoid process to direct the tip of needle anteromedially towards the coracoid. When in right direction, the needle faces little resistance on entering the joint. In Group A patients were injected 2 ml (80 mg) of methylprednisolone and 3 ml of 1% lignocaine and in Group B patients were injected with 2 ml (80 mg) of methylprednisolone and 3 ml of distilled water in the affected shoulder joint. The entry point was sealed with sterile gauge. After that half an hour of standard shoulder range of movement (ROM) exercise regimen was performed under supervision and advised to do it at home daily. Immediate pain relief and increase in range of movement was observed and scored by VAS and SPADI Score at every follow up visit at 1ST week, 3rd week and 6th week. They were assessed for improvement via VAS, range of movement [Table 1] and SPADI score.

RESULTS

Statistical analysis was performed with the SPSS, version 29 for Windows statistical software package (SPSS inc., Chicago, IL, USA). The Categorical data was presented as numbers (percent) and were compared among groups using Chi square test. The quantitative data was presented as mean and standard deviation and were compared by students t-test. Probability was considered to be significant if less than 0.05.

There were no statistically significant differences ($P > 0.05$) in the demographic parameters such as age, sex and ASA grading among the study groups [Table 2].

In our study, left shoulder involvement was only 31% and right shoulder involvement was 68.75 % and both groups were comparable in right and left side involvement of shoulder ($p = 1.00$). Mean duration of pain was 3.88 months in both groups and difference in mean duration of pain in both groups was non-significant ($p = 1.00$). The mean duration of restriction was 8.59 ± 1.11 months in Group A and 8.47 ± 1.11 months in Group B which was comparable in both groups ($p = 0.581$). [Table 3]

The mean VAS score was comparable in Group A (7.20 ± 0.75) and Group B (7.29 ± 0.71) before injecting the drug ($P = 0.517$). After half hour of drug injection, at the end of first week, at the end of third week and at the end of six week the difference in the mean VAS score of Group A and Group B was statically significant respectively (4.16± 0.68), (4.98 ± 0.94), ($P<0.001$); (1.89± 1.32), (5.54 ± 1.01), ($P<0.001$); (3.30 ± 0.50), (4.04 ± 0.74), ($P<0.001$) and (1.52 ± 0.66), (2.32 ± 0.83), ($P<0.001$). [Figure 1]

The difference in shoulder pain and disability index were statically significant in both groups after half hour of drug injection, at the end of first week, at the end of third week and at the end of six week ($p < 0.001$). [Figure 2]

There was statistically significant difference ($p < 0.001$) between two groups in all the parameters of ROM after half hour of drug injection, at the end of first week, at the end of third week and at the end of six week [Figure 3-6].

DISCUSSION

Frozen shoulder is an overused and in appropriate name given to most of most painful shoulder joints. True adhesive capsulitis or periarthritis shoulder is clinically identifiable as a disorder in which there is definite mechanical restriction of active and passive movement. Frozen shoulder is self-limiting in most of the cases having high co morbidity.[4,16]

The characteristic of the population was like previous studies. Frozen shoulder is considered as a disease of middle-aged person between 3rd to 7th decade. It usually affects women, frequently involves the non-dominant extremity and occurs bilaterally in as many as 34% of patients.[7,9,17]

In our study, mean age was 53.84 years with almost similar age distribution in each group. It was well supported by most of previous studies like the previous studies with female preponderance, in our study, female population was 59.82%.[7,9,17] There was more involvement of right side (69%) in our study while according to previous studies frozen shoulder effect non-dominant hand.[18,19]

The average duration of pain in our study was 3.8 months in both groups, which ranges from (1-7 months) which was lesser than study of DY Bulgen et al,[20] (6 months) in which range was from 1- 12 months and in study of RK Sharma et al,[4] it was 8 months, ranges from 2- 16 months. In this study we stated restriction as per previous studies documented loss of all active and passive shoulder movement flexion-extension, abduction-adduction, external

ISSN (O): 2687-5365; ISSN (P): 2753-6556

rotation- internal rotation as inclusion criteria for patient selection.[21,22] In a study by B. Shaffer et al average duration of restriction of movement was 8 months ranges from 2-24 months. In our study it was 8.53 months, ranges from 2-12 months.[23]

In our study mean VAS of group A decreases from 7.2 to 1.52 and SPADI decreases from 82.13 to 27.16. Mean VAS of group B decreases from 7.29 to 2.32 and SPADI from 81.91 to 37.45. Decreasing in VAS and SPADI was supported by studies of wei-chun-hsu et al,[24] and Simon Carette et al.[25] VAS and SPADI had significantly lower values with methylprednisolone and lignocaine than methylprednisolone and distilled water which was favoured by a study of A. Pandey et al.[19] They used 2 ml (80 mg) of methylprednisolone with 3 ml of 1% Lignocaine in Group A and 2 ml (80 mg) of methylprednisolone with 3 ml of distilled water in Group B.

In both groups restriction in range of motion (Figure 3-6) was decreased after the procedure but there was significantly greater improvement in range of motion in Group A with methylprednisolone and lignocaine. In a study Marx et al explained that early treatment with intraarticular corticosteroid provided a chemical ablation of the synovitis which limit the fibrotic process in the capsule.[26] With resolution of the synovitis and termination of capsular scar formation, capsular remodelling and recovery of range of motion (ROM) occurs which was supported by the orthopaedic and rheumatologic literature.[27,28] No side effect of methylprednisolone was seen as criticized by others because small single dose of injection was used in intraarticular form not systematic.

In another study, Wei-Chun-Hsu et al used lignocaine immediately before stretching or mobilization exercise which effectively relieved pain during the exercise programme that enhanced the effectiveness of the physiotherapy.[24] Lignocaine hydrochloride, the most widely used local anaesthetic is a reversible blocker of conduction along the small nerve fibres that carry pain and autonomic impulses. The effect occur within seconds and the block lasts for approximately 60-90 minutes. Once the patients can move their shoulder, their fear and pain on movement also decreases. This improves compliance and results in better post-treatment outcomes. Since physiotherapy is prime modality of treatment, immediate pain relief is a major determinant for patients to carry out exercises.

Clark et al reported that recovery was better with active physical therapy after intraarticular injection.[29] In our study stretching or mobilization of joint was performed 10-15 minutes after intraarticular injection and half an hour of standard shoulder ROM exercise daily.

Our findings were similar to a study carried out by A. Pandey et al in which the average duration of presenting symptoms was 10 weeks but, in a study, Christine M Alverez et al studied that steroid to be no more effective in improving the quality of life, range of motions than lignocaine alone in patients of frozen shoulder.[29,30] The cause behind the good to excellent results in almost all patients in our study may be due to using two best treatment modalities approved by previous studies, continuous supervised physical therapy, regular follow ups and motivation of patients.

CONCLUSION

We came to the conclusion that individuals with frozen shoulder respond very well to methylprednisolone and lignocaine combined with supervised physical therapy. The processes are easy to follow, take little time, and are reasonably priced. It is our belief that not all patients with frozen shoulder will recover spontaneously, even over a prolonged length of time, thus these modalities should be made available to them all.

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ISSN (O): 2687-5365; ISSN (P): 2753-6556

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ISSN (O): 2687-5365; ISSN (P): 2753-6556