



## Comparison of intralesional corticosteroid injection with and without thumb Spica cast for de-Quervain tenosynovitis.

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**ABSTRACT... Objective:** To compare efficacy of methyl prednisolone acetate injection with and without thumb spica cast for the treatment of de-Quervain tenosynovitis. **Study Design:** Randomized Controlled Trial. **Setting:** Orthopedic Unit, Allied Hospital, Faisalabad. **Period:** April 2016 to September 2016. **Material & Methods:** In each group 41 patients were included with non-probability consecutive sampling. **Results:** Eighty two patients were enrolled in the study. Out of 82 patients in the study, 3 (3.7%) were males and 79 (96.3%) were females. There were 10 (12.20%) patients with age >40 years, and 36 (43.90%) patient in each of age group 21-30 and 31-40 years. The proportions of cured persons between two groups i.e., treated with corticosteroid injection and those treated with combination of injection and thumb Spica splint were found same with p-value 0.19 for Z=1.31. The efficacy was independent of treatment methods with  $\chi^2=1.10$  (p-value = 0.30). The same independence pattern was also observed in different age groups. Age range was between 18 and 70 years. Statistical analysis was performed using chi-square test. Six weeks following treatment, 29 (35.37%) patients from group A and 34 (41.46%) patients from group B showed relief of pain, swelling and tenderness and a negative Finkelstein test (p-value 0.295). post stratification of gender showed no significant association (p-value 0.388 and 0.328 in groups A and B respectively). **Conclusion:** It has been concluded that use of corticosteroid injection alone is sufficient to treat de-Quervain syndrome as compared to the use of thumb Spica splint with corticosteroid injection. It is therefore recommended that in patients suffering from de-Quervain syndrome, corticosteroid injection may be the choice of treatment.

**Key words:** de-Quervain Tenosynovitis, Thumb Spica, Corticosteroid, Finkelstein Test.

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## INTRODUCTION

The de-Quervain's disease is a very common cause of disabling wrist pain which impairs the quality of life of the patients. The usual age of occurrence in adults is 30 to 50 years and women are affected six to ten times more frequently than men.<sup>1</sup>

All the tendons on dorsal aspect of wrist pass through six dorsal compartments. First dorsal compartment at the radial side of the wrist includes the Abductor Pollicis Longus and Extensor Pollicis Brevis tendons which are affected by inflammation and thickening of their sheath, resulting in impaired gliding of the tendons in the narrow and constricted fibro-osseous

compartment.<sup>2</sup> A septum may also divided it into sub-compartments.<sup>3</sup> It is caused by overuse and repetitive activities of the wrist in ulnar deviation, thumb in abduction and extension.<sup>4,5,6</sup> It may also occur during or after the pregnancy due to fluid retention, hormonal changes and lifting the child.<sup>4,7,8</sup>

The conventional treatments are nonsurgical including rest, massage, diathermy, casting, oral analgesics, and local steroid injection. Treatments like intralesional steroid injection with or without thumb spica cast are most widely used treatment options.<sup>9</sup>

Several studies have documented the efficacy of

steroid injection in de-Quervain's tenosynovitis. The effectiveness of injection therapy is often attributed to anti-inflammatory effects of corticosteroids but the exact mechanism of action remains unclear.<sup>10</sup> Splints are applied generally to immobilize and provide comfort and support via stabilization of an injury.<sup>11</sup>

Thumb spica cast along with intraslesional steroid injection has been shown to be effective in relieving symptoms while thumb spica alone has not been successful in relieving symptoms of this disabling disease.<sup>12</sup>

In a study by Mardani-Kivi et al, it has been shown that intraslesional steroid in combination with thumb spica cast improves symptoms in 93% patient of de-Quervain's tenosynovitis as compared to 69% with intraslesional steroids alone.<sup>13</sup>

This study was done due to lack of literature on this disease locally and in peer journals of the subject. It will provide the basis for treatment and further research in this regard reviewed.

## MATERIAL AND METHODS

This study was done at Allied Hospital Faisalabad from April 2016 to September 2016. Patients were enrolled in the study through out-patient department which fulfilled the inclusion criteria of Both male and female, Age ranges more than 18 years upto 70 years and Patient of de Quervains Tenosynovitis who had not taken treatment previously. Informed consent was taken from each participant of the study. Patients were divided into Group A and Group B using computer generated random number table. Patients in Group A were given Injection Methylprednisolone acetate (Solumedrol®) 40mg in 1ml injection lignocaine 2% in first dorsal compartment of wrist followed by thumb spica cast. Patients in Group B were given Injection Methylprednisolone acetate (Solumedrol®) 40mg in 1ml injection lignocaine 2% in first dorsal compartment of wrist alone.

Information was collected by the author and comprised of age, sex, address, and contact number, relief of pain at first dorsal compartment of wrist at 6 weeks, relief of tenderness at

first dorsal compartment of wrist at 6 weeks, Finkelstein test at 6 weeks. Follow up was done at 6 weeks. All the information was entered in a standardized performa by Principal Investigator and then converted to soft version in SPSS version 21.0. chi-square test applied to compare efficacy for both groups and p-value will be calculated. p-value of <0.05 will be taken as significant.

## RESULTS

The data was analysed with statistical software IBM SPSS version 21.0. The frequencies and the corresponding percentages of different symptoms and efficacy in two treatment groups are given in Table-I. The hypothesis of equality of proportion of cured persons with corticosteroid injection and those treated using thumb Spica splint with corticosteroid injection was tested. The value of test statistic  $Z = 1.31$  with p-value = 0.19 led to the conclusion that both proportions are same.

Table-I the frequencies and percentages of different symptoms and efficacy of treatment methods for the subjects in group A (treated with corticosteroid injection) and group B (use of thumb Spica splint with corticosteroid injection).

The results given in Table-I showed that the hypothesis of independence between treatment groups and efficacy is accepted with p-value = -0.30 corresponding to the  $\chi^2$  test statistic value of 1.10. This independence was also tested within different age group. Same hypothesis was further investigated for different age groups. The corresponding results are given in Table-II. The results again showed independence of efficacy and treatment methods in age groups 21-30, 31-40 and >40 years with  $\chi^2 = 0.02$  (p-value = 0.89), 0.63 (p-value = 0.43) and <0.0001 (p-value = 1) respectively.

A further investigation showed that efficacy has also no connection with age within two treatment groups i.e., use of corticosteroid injection and use of thumb Spica splint with corticosteroid injection. These results are given in Table-III.

Variable	Categories	Group		Chi-squared	P-Value
		A	B		
Relief of pain	Yes	29 (35.37%)	34 (41.46)		
	No	12 (14.63%)	7 (8.54%)		
Relief of tenderness	Yes	29 (35.37%)	34 (41.46)		
	No	12 (14.63%)	7 (8.54%)		
Finkelstein test	Yes	29 (35.37%)	34 (41.46)		
	No	12 (14.63%)	7 (8.54%)		
Efficacy	Yes	29 (35.37%)	34 (41.46)	1.096†	0.295
	No	12 (14.63%)	7 (8.54%)		

† Results are based on Yate's correction for continuity

Age	Efficacy	Group		Chi-squared	P-Value
		A	B		
21 – 30	Yes	14	17	0.018†	0.893
	No	3	2		
31-40	Yes	10	16	0.625†	0.429
	No	6	4		
>40	Yes	5	1	< 0.0001†	1
	No	3	1		

**Table-II. Results of effectiveness of treatment methods in different age groups.**

† Results are based on Yate's correction for continuity

Group	Age	Efficacy		Chi-squared (approximation)	P-Value
		Yes	No		
A	21-30	14	3	1.895	0.388
	31-40	10	6		
	>40	5	3		
B	21-30	17	2	2.227	0.328
	31-40	16	4		
	>40	1	1		

**Table-III. Relationship between age and efficacy within each treatment group.**

On the basis of all hypotheses tests, we can conclude that the use of corticosteroid injection alone is sufficient to treat de-Quervain 0, and thumb Spica splint may not be used with corticosteroid injection. Also, the cure is neither depending on the treatment method nor the age of the subjects.

## DISCUSSION

de-Quervain syndrome is a pathological condition of the wrist that occurs commonly. It is a tenosynovitis of the tunnel or sheath that surrounds the two tendons controlling the movement of thumb.<sup>1</sup>

Exact mechanism of de-Quervain's disease has not been determined to date, however it is thought that the cause is due to the synovial sheath thickening that contains abductor pollicis longus (APL) and the extensor pollicis brevis (EPB) tendons. It leads to the irritation of muscles which in turn causes swelling and pain over the radial side of the wrist and an increased difficulty in gripping objects.<sup>2</sup>

Most of the conditions involving musculoskeletal framework are managed more by convention as compared to relying on scientific data. Similarly, treatment regime of de-Quervain's disease is

determined more by convention. From the first documents excerpts of the disease in 1895 until the first documented use of corticosteroid injection by Jarrod Ismond in 1955<sup>14</sup>, it appears that surgery was the only treatment option.<sup>14,15,16</sup> Approximately since 1972, corticosteroid injection is the predominant treatment option which was suggested by McKenzie (1972) as the first line of treatment. He was of the opinion that surgery should be reserved only if treatment using injections was unsuccessful.<sup>17</sup>

A meta-analysis and systematic review published in 2013 showed that corticosteroid injection is an effective option when it comes to the conservative management of de-Quervain's disease in about 50% of the patients suffering from the disease, however to measure the extent of clinical benefits of corticosteroid requires more research in this respect.<sup>18</sup>

Palliative treatments include immobilization of the thumb and the wrist using a splint and acetaminophen or anti-inflammatory medication. Meta-analysis and systematic review does not support the notion of using splint over corticosteroid injections.<sup>19,20</sup>

## CONCLUSION

Thumb spica cast previously thought to have some role in managing this debilitating condition along with other treatment modalities has no role in the treatment either alone or in combination with other modalities. Use of corticosteroid injection alone is sufficient to treat de Quervain syndrome as compared to the use of thumb Spica splint with corticosteroid injection.

## DISCLAIMER

The abstract has not been previously presented or published in a conference. The manuscript was part of a thesis project.

## CONFLICT OF INTEREST

There is no conflict of interests.

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2	Rana Dawood Ahmad Khan	Technical support, Supervision, Final approval.	
3	Sajjad Iqbal	Artical writing, Publishing.	
4	Faisal Maqbool Zahid	Statistical analysis & interpretation of data.	
5	Mahwish Israr	Article writing & Proof reading.	
6	Bushra Aslam	Data collection, Article writing, Proof reading.	