



Original Article

Comparison of Analgesic Effects of UST with NSAIDs and without NSAIDs in Patients with De Quervain's Disease

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Abstract

Background: De Quervain's disease has been described as an entrapment of the extensor pollicis brevis and abductor pollicis longus tendons in the first dorsal compartment of the wrist is a common cause of wrist and hand pain Treatment of the disease consists of pharmacological & non-pharmacological. The non-pharmacological includes immobilization, therapeutic heat and cold, electrical nerve stimulator, thumb stabilizer splint, postural correction at work and the adjustment of tools and equipment. This randomized clinical trial was performed to find out the effects of UST with NSAIDs and without NSAIDs in the patients of De Quervain's disease.

Methods: This randomized clinical trial was performed in the Department of Physical Medicine and Rehabilitation, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh, over a period of six months. Group A-experimental or interventional group and group B-control group by randomization with the help of lottery. Experimental group was managed by activities of daily living (ADLs) instructions, ultrasound therapy (UST) with non-steroidal anti-inflammatory agents (NSAIDs gel), along with thumb spica splint. Control group B received previous management except non-steroidal anti-inflammatory agents (NSAIDs gel). All patients received therapeutic ultrasound in a same dosage (1 watt/cm²/min) for 8 minutes. An evaluation was made at initial visit and two weeks interval for 6 weeks. So, there were three follow up visits and these evaluations were performed by the same investigator. In each visit, measurement of pain intensity and disability level were performed by using visual analogue scale (VAS), Tenderness Index and Patient rated wrist evaluation (PRWE) respectively. All results was recorded systematically. A post intervention result was compared with baseline result by SPSS-20

Results: Out of 60 total patients 60(100%) had Finkelstein test positive. Significant difference between Group A and Group B was found at week 4 and Week 6 follow up (P<0.05) whereas other early follow up was non-significant in VAS analysis (p>0.05). Significant difference between Group A and Group B was found at week 4 and week 6 follow up (P<0.05) regarding change of tenderness and PRWE.

Conclusion: Regarding treatment of De Quervain's disease, present study shown that UST with NSAIDs gel reduces the morbidity and relief of pain of patients when in comparison to other conventional treatment.

key words: De Quervain's disease, ultra sound therapy, thumb splint

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Introduction

Tenosynovitis is inflammation of a tendon and its enveloping synovial sheath.¹ Stenosing tenosynovitis or de Quervain's disease is classically defined as a stenosing tenosynovitis of the synovial sheath of tendons of the abductor pollicis longus and extensor pollicis brevis muscles in the first compartment of the wrist due to repetitive use.² These musculotendinous units control the position and orientation, force application and joint stability of the thumb. The impaired gliding is believed to be as a result of thickening of the extensor retinaculum at the first dorsal (extensor) compartment of the wrist, with subsequent narrowing at the fibro-osseous canal.³ Extensor triggering, which is manifested by locking in extension, is rare but has also been reported in de Quervain's tenosynovitis with a prevalence of 1.3%.⁴ Overexertion related to household chores and recreational activities including piano playing, sewing, knitting, typing, bowling, golfing, and fly-fishing have been reported to cause de Quervain's tenosynovitis. Workers involved with fast repetitive manipulations such as pinching, grasping, pulling, and pushing are also at risk.⁵ Excessive use of the text messaging feature on a cellular phone has now also been linked to this painful condition.⁶ Presenting symptoms are pain and swelling at the base of the thumb having positive Finkelstein test.⁷

Patients having diabetes, RA and pregnant women are more prone to develop de Quervain's disease.^{8,9} There is no predilection for right versus left side, and no racial differences have been observed.¹⁰ The goal of treatment for de Quervain's disease is to relieve the pain and swelling and restore normal function. Activity modification is often the most important consideration in conservative management.¹¹

Materials and Methods

After clearance from the institutional review board of BSMMU, patient with wrist pain attending the

out-patient department of Physical Medicine & Rehabilitation BSMMU, 60 Patients with de Quervain's disease were selected from the 8th December 2015 to 7th June 2016. Patients of de Quervain's disease were allocated into two groups group A or group B by lottery. All data was recorded systematically in a semi-structured questionnaire. Group A UST with NSAIDs gel (Phonophoresis) + ADLs + Thumb spica splint. Group B UST without NSAIDs gel + ADLs + Thumb spica splint. Equipment to be used for outcome is Data collection sheet, VAS, Tenderness Index, PRWE questionnaire. A thorough history was taken from the registered patients and clinical examination of the patients was done which includes general examination, musculoskeletal and neurological examination of upper limbs, examination of cervical region and wrist joint to find out the cause of wrist pain. Past history of illness and any systemic diseases was inquired cautiously. Patient who met exclusion criteria were excluded. All symptoms and signs of each participant were recorded accordingly and clinical diagnosis was made. Relevant investigation was done. Thus diagnosis of de Quervain's disease was confirmed clinically after exclusion of other possible diagnosis by related investigation. Pre intervention and post intervention pain score & tenderness were evaluated by visual analogue scale (VAS) and Tenderness index (TI) respectively. Similarly functional status was assessed by using Patient rated wrist evaluation (PRWE) questionnaire. At first PRWE questionnaire was translated into Bangla to make it easily understand to participants. The questionnaire was finalized following pretesting. The post intervention responses were recorded at 2 weekly intervals for six weeks following initiation of treatment. All data were recorded systematically in the data sheet.

Thumb spica splint:



Fig: Thumb spica splint

Ultrasound therapy machine:



Fig: Ultrasound therapy machine



Fig: Patient receiving UST without NSAID and UST with NSAID gel

Result: 60 patients were selected for this study. They were randomly divided into 2 groups.

Table 1: Gender distribution of study patients

| Gender | Group | | Total (n=60) No. (%) |
|--------|-------------------|-------------------|-------------------------|
| | Group A (n=30) | Group B (n=30) | |
| Male | 6 | 10 | 16 (26.6%) |
| Female | 24 | 20 | 44 (73.3%) |
| Total | 30 | 30 | 60 (100%) |

There were 44 female (73.3%) and 16 male (26.6%) in the study and female male ratio was 2.75:1.

Table 2: Age distribution of the patients

| Age of Respondent | Group | | Total (n=60) No. (%) |
|-------------------|-------------------|-------------------|-------------------------|
| | Group A (n=30) | Group B (n=30) | |
| 26-35 Yrs | 14 | 18 | 32 (53.3%) |
| 36-45 Yrs | 12 | 9 | 21 (35.0%) |
| 46-55 Yrs | 4 | 3 | 7 (11.7%) |
| Total | 30 | 30 | 60 (100%) |

32 patients (53.3%) were between 26-35 years and 21(35%) patients were in 36-45 years and 7(11.7) were in 46-55 years. the mean age was 34.02 years. Most of the patients were between ages 26-35 years in the two study groups. (Table-2)

Table 3: Occupation of the patients

| Occupation | Group | | Total (n=60) No. (%) |
|----------------|-------------------|-------------------|-------------------------|
| | Group A n (30) | Group B n (30) | |
| House wife | 23 | 19 | 42 (70%) |
| Service holder | 5 | 10 | 15 (25%) |
| Students | 2 | 1 | 3 (5%). |
| Total | 30 | 30 | 60 (100%) |

Most patient's occupation were housewife 42 (70%). Others were service holder (Banker, Nurse, computer operator, tea maker, teacher) 15 (25%) and students 2 (5%).

Table 4: Socioeconomic Status of the patients

| Socioeconomic Status | Group | | Total (n=60) No. (%) |
|-------------------------|-------------------|-------------------|-------------------------|
| | Group A (n=30) | Group B (n=30) | |
| Poor | 1 | 1 | 2 (3.33%) |
| Middle class | 28 | 28 | 56 (93.33%) |
| Rich | 1 | 1 | 2 (3.33%) |
| Total | 30 | 30 | 60 (100%) |

Most of the patients were middle class 56 (93.33%).

Table 5: Involved Wrist

| Involved Wrist | Group | | Total (n=60) No. (%) |
|-------------------|-------------------|-------------------|-------------------------|
| | Group A (n=30) | Group B (n=30) | |
| Right | 26 | 28 | 54 (90%) |
| Left | 2 | 1 | 3 (5%) |
| Both | 2 | 1 | 3 (5%) |
| Total | 30 | 30 | 60 (100%) |

Involvement of wrists was more in the right 54 (90%), in Group-A 26 (86.6%) and in Group-B 28 (93.3%). Whereas left wrist and both wrist involvement were less, only 3 (5%)

Table 6: Aggravating Factors

| Aggravating Factors | Group | | Total (n=60) No. (%) |
|--------------------------|-------------------|-------------------|-------------------------|
| | Group A (n=30) | Group B (n=30) | |
| Wringing of cloth | 7 | 5 | 12 (20%) |
| Lifting of heavy objects | 5 | 5 | 10 (16.66%) |
| Repetitive grasping | 18 | 17 | 35 (58.33%) |
| Diabetes Mellitus | 0 | 1 | 1 (1.66%) |
| Pregnancy | 0 | 2 | 2 (3.33%) |
| Total | 30 | 30 | 60 (100%) |

De Quervain's disease was more found in female who had a precipitating factor as repetitive grasping 35 (58.33%), some developed this condition due to lifting heavy objects such as baby 10 (16.66%) and wringing of cloth 10 (16.66%). Diabetes mellitus 1 (1.66%) and pregnancy 2 (3.33%) also precipitated the condition.

Analysis of VAS at different follow up data in both group: Significant difference between Group A and Group B was found at week 4 and Week 6 follow up ($P < 0.05$).

Table 7: Pain analysis by VAS

| Pain on VAS | | Group | | Total (n=60) No. (%) | | p-value |
|-------------------|---------------|-------------------|-------------------|-------------------------|----------|---------|
| | | Group A (n=30) | Group B (n=30) | | | |
| During enrollment | Mild pain | 1 | 3 | 4(6.6%) | 60(100%) | |
| | Moderate pain | 26 | 25 | 51(85%) | | |
| | Severe pain | 3 | 2 | 5(8.3%) | | |
| After Week 2 | Mild pain | 1 | 2 | 3(5%) | 60(100%) | .500 |
| | Moderate pain | 29 | 28 | 57(95%) | | |
| After Week 4 | Mild pain | 26 | 6 | 32(53.3%) | 60(100%) | .000 |
| | Moderate pain | 4 | 24 | 28(46.6%) | | |
| After Week 6 | No pain | 25 | 7 | 32(53.3%) | 60(100%) | .000 |
| | Mild pain | 5 | 23 | 28(46.6%) | | |

After Week 6, mild pain in group-A 5(16.6%) and group-B 23(76.6%) and No pain Group-A 25(83.3%) and Group-B 7(23.3%). Between the two study groups showed significant variation (Table 7). Post-treatment pain score showed significant improvement ($P < 0.01$) in Group-A patients compared to group-B. After week 6, Gr-1 tenderness in group-A 30(100%) and group-B 30(100%). Between the two study

groups showed significant variation (Table-8). Post-treatment tenderness index showed significant improvement ($P<0.01$) in Group-A patients compared to group-B.

Analysis of patient rated wrist evaluation (PRWE) at different follow up data in both group: Significant difference between Group A and Group B was found at week 4 and week 6 of follow up ($P>0.05$) regarding PRWE.

Table 8: PRWE evaluation

| Patient Rated Wrist Evaluation(PRWE) | | Group | | Total (n=60) No. (%) | P value |
|--------------------------------------|---------------|-------------------|-------------------|-------------------------|------------|
| | | Group A (n=60) | Group B (n=60) | | |
| During enrollment | Mild pain | 5 | 7 | 12(19.9%) | .374 |
| | Moderate pain | 25 | 23 | 48(79.6%) | |
| | Total | 30 | 30 | 60(100%) | |
| After Week 2 | Mild pain | 5 | 7 | 12(19.9%) | |
| | Moderate pain | 25 | 23 | 48(79.68%) | |
| | Total | 30 | 30 | 60(100%) | |
| After Week 4 | Mild pain | 30 | 30 | 60(100%) | .000 |
| | Total | 30 | 30 | | |
| After Week 6 | Pain free | 23 | 5 | 28(46.4%) | .000 |
| | Mild pain | 7 | 25 | 32(53.12%) | |
| | Total | 30 | 30 | 60(100%) | |

During enrollment in both groups most patients had moderate pain in group-A 25(83.3%) and group-B 23(76.6%). After week 4, mild pain in group-A 30(100%) and group-B 30(100%). After week 6, Pain free in group-23(76.6%) and group-B 5(16.6%) Between the two study groups showed significant variation (Table-9). Post-treatment tenderness index showed significant improvement ($P<0.01$) in group-A Patients compared to group B

Table-9. Final outcome of treatment in the study patients

| Outcome | Group A (n=30) | Group B (n=30) | Total | P value |
|-------------------------------------|----------------|----------------|-----------|---------|
| Completely cured | 23 | 5 | 46.6% | .000 |
| Moderate/Mild reduction of symptoms | 7 | 25 | 53.33% | |
| Total | 30 | 30 | 60 (100%) | |

Table-10 shows final result of treatment in the two groups of patients. In group A, 23 (76.66%) and in group B, 5 (16.66%) patients were completely cured (no pain, no tenderness, no swelling) and moderate/mild reduction of symptoms in Group A was 7 (23.33%) and in Group B was in 25 (83.33%). The cure rate showed statistically significant improvement in Group-A.

Discussion

In the present study gender in both groups male and female were matched and female to male ratio was 2.75:1. Female 44 (73.3%) were more affected than male 16 (26.6%). Socioeconomic status was found different in both groups where poor was 2 (3.3%), middle class was 56 (93.33%) and rich was 2 (3.3%). In the present study regarding wrist involvement right wrist were involved more in Group B 28(93.3%) than Group A 26(86.6%). There were some patients who had both wrist involvements (5%). All patients in both groups had some aggravating factor but relieving factors were less. It has been reported that 8.3% of patients present with upper extremity conditions as their chief complaint in chiropractic practices.^{12,13}

De Quervain's has also been shown to usually present in the fifth and sixth decades of life, as well as being more common in pregnant and lactating women. The medication included non-steroidal Anti-inflammatory Drugs (NSAIDs) and analgesic, an injection of a steroid mixed with xylocaine into tendon sheaths. Decompression of the first dorsal compartment demonstrated a good result, but surgery is rarely made except if the patient does not respond well to that treatments¹⁴. The positive outcome was a complete resolution of the patient's complaint. Significant difference between Group A and Group B was found at week 4 and Week 6 follow up ($P < 0.05$) where as other early follow was non-significant in VAS analysis ($p > 0.05$). Significant difference between Group A and Group B was found at week 4 and week 6 follow up ($P < 0.05$) regarding change of tender index in Group A than Group B. Significant difference between Group A and Group B was found at week 4 and week 6 of follow up ($P > 0.05$) regarding PRWE. So it can be said that group-A patients who were treated along with UST+NSAIDs had better outcome in reduction of pain and day to day activity.

Conclusion

From our study we can conclude that patient having symptoms of De Quervain's disease, getting treatment as early as possible with UST with NSAIDs is more effective than UST without NSAIDs.

Recommendation:

UST with NSAIDs among the patients with de Quervain's tenosynovitis along with other conservative management is beneficial.

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