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Original article

Corticosteroid injection for relief triggering symptom in trigger finger

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Background: Triggering symptom is a common problem in patients with trigger finger. Corticosteroid has been found to be effective in the treatment of trigger finger, but not clearly defined in the effectiveness of injection in term of relief triggering symptom.

Objectives: The purpose of this study was to investigate the effectiveness of corticosteroid injection in term of relief triggering symptom in patients with trigger finger.

Methods: We reported 23 patients with a total of 23 fingers, who were treated by corticosteroid injection for treatment of trigger finger. We tested triggering events in ten active fists for evaluation of triggering symptom before injection and 6 weeks after injection. Clinical data were statistically analyzed by paired *t* - test or Wilcoxon sign rank test.

Results: Most patients in the study were women (22, 95.6 %). The three most commonly affected digits were the thumb (43.5%), the ring finger (34.8%) and the middle finger (21.7%). After corticosteroid injection, the triggering symptom was significantly decreased from 10.00 ± 0.00 to 0.13 ± 0.62 ($P < 0.001$) at 6 weeks after injection. There were no major complications.

Conclusions: Triggering symptom can be treated effectively by corticosteroid injection in the patients with trigger finger. Corticosteroid injection therapy is safe and highly effective.

Keywords: Thumb, digit, trigger finger, corticosteroid, injection, triggering symptom.

Trigger finger (stenosing tenosynovitis) is one of the most common disorders of the hand seen in the outpatient department. This disease is about six times more common in women than in men, and much more in middle-aged women. The most common affected fingers are thumb, middle, and ring finger.^(1,2) Clicking or locking symptom is the common symptom found in the patient. The exact cause of trigger finger is still unknown.^(2,3) Disproportion of flexor tendon and pulley and nodule appearance are the causes of trigger finger mentioned in some studies.^(2,4) Tenosynovitis of flexor tendon and thickening of pulley are another causes of trigger finger.⁽⁵⁾ Trigger finger can be associated with diabetes, carpal tunnel syndrome, de Quervain's disease, hypothyroidism, rheumatoid arthritis, renal disease, and amyloidosis.^(2,6)

The Quinnell grading system is used to assess clinical severity of trigger finger.⁽⁷⁾ According to this classification, trigger fingers are rated as follows: grade 0, normal movement; grade I, uneven movement; grade II, actively correctable; grade III, passively correctable; and, grade IV, fixed deformity.

Conservative treatment is the mainstay for most trigger fingers. Among these corticosteroid (CS) injection has a highly satisfactory outcome with minimal complications.⁽⁸⁾ CS injections have been found to be effective in the treatment of trigger finger in case of pain relief, triggering relief but not mentioned clearly for decreasing frequency of triggering symptom in the patients.⁽⁹⁾ The objective of this study was to determine the effectiveness of CS injection for relief triggering symptom in the patient.

Materials and methods

After approval from the Research Affairs was obtained, twenty-three patients with trigger finger at the outpatient clinic were enrolled in this study. Inclusion criteria included any adult patients age of 18 years or older with only single trigger finger of

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Quinnell grades II-III and patients having symptoms not more than 4 months prior to treatment. The exclusion criteria included multiple trigger digits, previous steroid injection, congenital trigger finger and associated with diabetes, carpal tunnel syndrome, de Quervain's disease, hypothyroidism, rheumatoid arthritis, renal disease and amyloidosis. Informed consent was obtained from each patient. Triggering events in ten active fists was tested by palpation technique and recorded for each patient by the first assessor (K.P.) before CS injection was performed. All patients were injected with 1 ml. of 10 mg/ml triamcinolone acetonide mixed with 1.0% lidocaine hydrochloride 1 ml. A 25-gauge needle was used to inject the solution into flexor tendon sheath (intrasheath injection technique) over the palmar aspect of the metacarpal head around the A1 pulley region. Re-evaluation for triggering events in ten active fists for each patient was performed by the second assessor (K.W.) at 6 weeks after the injection. Clinical data were statistically analyzed by paired *t* - test or

Wilcoxon sign rank test, $P < 0.001$ was defined as statistically significant.

This study has been approved by Institutional Review Board, the Faculty of Medicine, Chulalongkorn University.

Results

Twenty-three patients with 23 trigger digits were included in the study. There were one man and 22 women, with a median age of 52 years old (range, 45 - 61 years). All patients were right-handed. The involved digits included 10 thumbs (43.5%), 8 ring fingers (34.8%), and 5 middle fingers (21.7%) respectively. The demographic and clinical data of the patients are shown in Table 1. Triggering events in ten active fists was tested for each patient before and 6 weeks after CS injection. After CS injection, triggering symptom was significantly decrease from 10.00 ± 0.00 to 0.13 ± 0.62 ($P < 0.001$) at 6 weeks post CS injection.

Table 1. Demographic data of the patients.

Patient/gender	Age (yr)	Underlying	Occupation	Affected finger
1/F	58	Hypertension	Housewife	Rt. thumb
2/F	49	No	Cook	Rt. thumb
3/F	60	Hypertension	Housewife	Rt. middle finger
4/F	46	No	Bank officer	Rt. ring finger
5/F	48	No	Accountant	Rt. thumb
6/F	51	No	Housewife	Rt. thumb
7/F	46	No	Barber	Rt. thumb
8/F	54	Heart disease	Housewife	Rt. ring finger
9/M	60	Hypertension	Soldier	Rt. middle finger
10/F	48	No	Bank officer	Rt. thumb
11/F	45	No	Accountant	Rt. thumb
12/F	56	Immune disease	Housewife	Rt. thumb
13/F	49	No	Bank officer	Rt. middle finger
14/F	50	No	Housewife	Rt. ring finger
15/F	46	No	Housewife	Rt. ring finger
16/F	53	No	Housewife	Rt. middle finger
17/F	55	Hypertension	Bank officer	Rt. ring finger
18/F	61	Hypertension	Housewife	Rt. thumb
19/F	50	No	Cook	Rt. ring finger
20/F	55	No	Housewife	Rt. middle finger
21/F	59	Hypertension	Housewife	Rt. thumb
22/F	57	No	Housewife	Rt. ring finger
23/F	58	No	Housewife	Rt. ring finger

Discussion

Trigger finger is caused by disproportion between size of flexor tendon and its sheath. Several treatment methods have been performed, such as rest, anti-inflammatory medication, splinting, corticosteroid injection and surgical release.⁽¹⁾ CS injection is the mainstay of non-operative treatment with satisfactory results, without major complications.^(6, 10 - 12) CS injections also demonstrated a better outcome when compared to other interventions such as nonsteroidal anti-inflammatory drugs⁽¹³⁾, physiotherapy⁽¹⁴⁾, and splinting.⁽¹⁵⁾ Previous studies in the past reported the efficacy of CS injection by questionnaire, interviewing or even visual analog scale for pain measurement, but not stated clearly about respond on triggering symptom after CS injection.^(6, 10 - 12) Marks MR, *et al.*⁽¹²⁾ reported long term outcome of CS injection in 108 trigger fingers by telephone interview. Newport ML, *et al.*⁽⁶⁾ reviewed 235 patients with 338 trigger fingers determined efficacy of CS injection by review out-patient document. Benson LS, *et al.*⁽¹⁶⁾ reviewed 102 patients and compared efficacy between CS injection and surgery for treatment of trigger finger by using post treatment questionnaire for assessment. Sawaizumi T, *et al.*⁽¹¹⁾ described intrasheath triamcinolone injection for trigger digit and evaluated the treatment outcome by using a visual analog pain scale. Dala-Ali BM, *et al.*⁽¹⁰⁾ used interviewing for assessment efficacy of CS injection. Shakeel H. and Ahmad TS.⁽¹⁷⁾ compared outcomes of steroid injection and NSAID injection for treatment of trigger finger by assessment of Quinnell grading improvement. Shultz KJ, *et al.*⁽¹⁸⁾ reported outcomes of corticosteroid treatment for trigger finger by history taking and physical examination for evaluation. Yildirim P, *et al.*⁽¹⁹⁾ compared the efficacies of extracorporeal shock wave therapy and corticosteroid injection for trigger finger management, the authors evaluated effectiveness by using a visual analogue scale and the Quick-Disabilities of the Arm, Shoulder, and Hand questionnaire at 1, 3, and 6 months after treatment. In this study we focused on triggering symptom after CS injection by using triggering events in ten active fists test for evaluation before and after CS injection. From this study we chose the patients with single digit involvement for clearly defined, and showed 10 triggering events in ten active fists for all our 23 patients before CS injection. From meta-analysis reported by Ma S, *et al.*⁽²⁰⁾ showed effectiveness of corticosteroid injection could be

achieved after 1-12-month follow-up. Efficacy of CS injection in term of decreasing triggering symptom in this study showed statistically significant decrease from 10.00 ± 0.00 to 0.13 ± 0.62 in short-term follow-up (6 weeks) and was not correlated with the digit being injected. There were no major complications reported in the study. Limitations of the study were limited sample size, lack of comparison group and no long term outcome recorded.

Conclusion

CS injection can be used for treatment of trigger finger in catching or locking stage with safe and highly effective. Furthermore, CS injection can significantly relieve triggering symptom in all patients in the study.

Conflict of interest

The authors, hereby, declare no conflict of interest.

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