Original Article | Carpal Tunnel Syndrome

Mean Decrease in Distal Motor Latency after Treated with Local Steroid Injection in Symptomatic Patients of Carpal Tunnel Syndrome

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ABSTRACT

Objective: To determine the mean decrease in distal motor latency after administration of local corticosteroid injection in symptomatic.

Study Design: Quasi experimental trial study.

Place and Duration of Study: This study was conducted at the Department of Neurology, Mayo Hospital, Lahore over a period of six months from 01.02.2012 to 31.07.2012.

Materials and Methods: One hundred cases were included. Baseline distal motor latency (DML) was assessed by using nerve conduction study on distal position. Then patients were administered corticosteroid injection (triamcinolone acetonide 20mg) through distal (palmar) approach.

Results: Mean age of the patients was 52.4±6.1 years. Out of 100 patients, 22 (22.0%) were males and 78 (78.0%) were females. Mean distal motor latency at baseline was 5.5±2.6, at 4th week 4.8±2.4 and mean decrease was observed 0.7±0.2.

Conclusion: Local corticosteroid injection for carpal tunnel syndrome provides statistically significant mean decrease in distal motor latency on nerve conduction study in 4 weeks after injection.

Keywords: Carpal tunnel syndrome, Distal motor latency, Corticosteroid injection

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INTRODUCTION

Carpal tunnel syndrome (CTS) is caused by entrapment of the median nerve at the wrist and symptoms consist of paresthesias and numbness in the area of median nerve innervations. Frequently pain in the hand and wrist is present, sometimes radiating to more proximal areas of the arm. Most cases are idiopathic, sometimes there are underlying factors causing compression of the median nerve.[1,2]

Carpal tunnel syndrome can be treated with oral analgesics, splinting, and injections with corticosteroids of surgery. Marshall et al[3] investigating the local corticosteroid injection for carpal tunnel syndrome showed that steroid injection provides greater improvement in symptoms one month after injection than placebo injection, but significant symptom relief of steroid injection beyond one month could not be demonstrated. The risk of adverse events for steroid injection therapy for CTS has been estimate to be less than 0.1%.[4]

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If corticosteroid-injection provided by general practitioner proves to be effective and safe, it could have important advantages for individual patients (less waiting-time and the availability of this treatment modality in the proximity of the patient) and healthcare-system (treatment in primary care would be more cost-effective).[5]

Local corticosteroid injection for the treatment of CTS provides significant symptom improvement for three months. Distal motor latency (DML) of median nerve was reduced up to 0.6 msec. In this trial it as observed that baseline DML was 5.2±0.9 msec which was reduced up to 4.6±0.6 msec (p value <0.05) after 1 month (4 weeks) of administration of corticosteroid injection.[6]

MATERIALS AND METHODS

This quasi experimental trial was carried out at Department of Neurology, Mayo Hospital, Lahore over a period of six months from 01-02-2012 to 31-07-2012. One hundred cases were included. Patients of age 40-75 years of either gender, presenting with symptoms and signs suggestive and carpal tunnel syndrome were included. History of presence of contraindications for corticosteroid injection, prior treatment for CTS in the last six months with steroid injection or surgery or splinting of wrist, traumatic or neoplastic origin of symptoms and hypothyroidism (T3 <2.3 or T4 <4.5 or TSH >5.5), diabetes (BSR >180mg/dl) were excluded.

Baseline DML was assessed by using nerve conduction study on distal position. Then patients were administered corticosteroid injection (triamcinolone acetonide 30mg) through distal (palmar) approach. The distal site of injection was at volar side of the wrist distal to the wrist crease at the palmer site. The injection was given with 13mm long 0.45mm needle with the angle of 5-10° or parallel to arm, while 40-50° wrist extension (dorsiflexion). Needle was introduced slowly and the patient was instructed to say stop if he or she felt pain, pins or needles in the fingers. If a resistance was felt it was withdrawn a few millimeters then repositioned. Then patients were followed-up weekly in OPD for 4 weeks. DML was noted by using nerve conduction study on distal position on 4th week. Data was analyzed through computer software SPSS version 20.

RESULTS

The mean age of the patients was 52.4±6.1 years (Table 1). Out of 100 patients, 22 patients (22.0%) were male while remaining 78 patients (78.0%) were female (Table 2). Mean distal motor latency at baseline was noted 5.5±2.6, at 4th week 4.8±2.4 and mean decrease was observed 0.7±0.2 (Table-3).

Table No.1: Groups with reference to age of patients (n = 100)

Age (Year)	Number	Percentage
40-50	61	61.0
51-60	28	28.0
61-70	11	11.0
Mean±SD	52.4±6.1	

Table No.2: Groups with reference to sex of patients (n = 100)

Sex	Number	Percentage
Male	22	22.0
Female	78	78.0

Table No.3: Mean decrease in distal motor latency on nerve conduction study

Reading	Mean	S.D
At baseline	5.5	2.6
At 4th week	4.8	2.4
Mean decrease	0.7	0.2

DISCUSSION

Median nerve is anatomically located underneath flexer ratinaculam where it is most likely to be compressed precipitating clinical presentation of "Carpal tunnel syndrome", there are motor and sensory findings which the patients have and this is by far quit frequent happenings. Since palmar cutaneous branch is given before median nerve enters carpal tunnel, so signs and symptoms associated with damage to the palmar cutaneous branch are not observed. Clinical setting pertaining to Carpal tunnel syndrome can be really troublesome for the patients. This condition can also result from fluid overload conditions such as pregnancy'. This syndrome can be managed conservatively but if situation is severe surgical intervention of flexer ratinaculam is the option.[7] Manktelow et al[8] stated that Carpal tunnel syndrome imposes a lot of disability to the patients. Flexer ratinaculam is modification of deep fascia of forearm. Flexer ratinaculam concavity of carpal bones into a tunnel through which median nerve passes into hand in association with long flexer tendons of the hand and forearm.

De Krom et al[9] in 1992 documented that 3.4% of mature females were found to have Carpal tunnel syndrome. Ferry et al[10] proved in their research work, that Carpal tunnel syndrome was seen in 7-16%. In another research done in Hasan Sadikin Hospital, Bandung, on four hundreds eighty five cases of Carpal tunnel syndrome, women were involved predominately.

Nonsteroidal anti inflammatory drugs are useful in Carpal tunnel syndrome, diuretics and pyridoxine are also effective. Before surgery, parenteral administration of corticosteroids is preferred to be advised.[11] this injection dose a lot good in relieving the of Carpal tunnel syndrome. Chang et al documented that corticosteroid tablets are useful in Carpal tunnel syndrome.[12]

Age group between forty years and sixty years is most likely to be affected by Carpal tunnel syndrome.[13] Results of current research are in agreement with work done by Ferry et al.[14]

In this research work, fundamental "DML is 5.5±2.6 msec and statistically significant" lowering was observed e.g. 4.8±2.4 msec (p value <0.05) post four 4 weeks of giving parenteral corticosteroid . Findings of current research are in agreement with results of Milo et al.[6]

Kumar[15] has stated that in as we give tablet form steroid, only 10% of the patients are benefited, but parenteral administration of steroid are much more effective and bring about better clinical outcomes. "Triamcinolone acetonide" was the Triamcinolone administered in current research work for Carpal tunnel syndrome. Triamcinolone has been proved to be best form in management of Carpal tunnel syndrome.[15]

CONCLUSION

Regional administration of corticosteroid injection as conservative management of carpal tunnel syndrome provides statistically significant mean decrease in distal motor latency on nerve conduction in four weeks after injection.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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