

**THE EFFICIENCY OF LOCAL CORTICOSTEROID WITH ORAL CORTICOSTEROID  
IN REDUCING CTS SYMPTOMS BY SYMPTOMS SEVERITY SCORE AND  
FUNCTIONAL STATUS SCORE**Dr. Anis Ahmed<sup>1\*</sup>, Dr. Sukumar Majumdar<sup>2</sup>, Dr. Subash Kanti Dey<sup>3</sup> and Dr. Md. Shahidullah<sup>4</sup><sup>1</sup>Assistant Professor, Dept. of Neurology, Bangabandhu Sheikh Mujib Medical University, Dhaka.<sup>2</sup>Assistant Professor, Dept. of Neurology, Rangpur Medical College Hospital, Rangpur.<sup>3</sup>Associate Professor, Dept. of Neurology, Bangabandhu Sheikh Mujib Medical University, Dhaka<sup>4</sup>Associate Professor, Dept. of Neurology, Bangabandhu Sheikh Mujib Medical University, Dhaka.**\*Corresponding Author: Dr. Anis Ahmed**

Assistant Professor, Dept. of Neurology, Bangabandhu Sheikh Mujib Medical University, Dhaka.

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**ABSTRACT**

**Background:** Nowadays, injection with corticosteroids is one of the many recommended treatments and one of the most studied treatment modalities for Carpal tunnel syndrome (CTS). **Objective:** In this study our main goal is to evaluate the efficiency of local corticosteroid with oral corticosteroid in reducing CTS symptoms by symptoms severity score and functional status score. **Method:** This was a randomized controlled clinical trial carried out in the Department of Neurology, Bangabandhu Sheikh Mujib Medical University (BSMMU) starting from July 2020 to June 2021. A total of 80 patients attending the outpatient of Department of Neurology, BSMMU, designated as clinically suspected CTS and established by electrophysiological parameters and treated in two groups. One group, n=40 received Injection Triamcinolone 30 mg close to carpal tunnel once in a month and other group, n=40 received oral steroids for one month. **Results:** During the study, Majority of the patients in both treatment groups (65% in local steroid and 60% in oral steroid group) were female. In local steroid injection group, symptoms were greatly reduced than those who received oral steroid. Relief from nocturnal awakening was also appreciably higher in the steroid injection receivers (70%) than that in the oral steroid receivers (5%). Symptoms severity score and functional status score were also at much lower level in the former group than those in the latter group ( $p < 0.001$  and  $p < 0.001$  respectively). Relief of numbness was considerably higher in the steroid injection, 37.5% than that in the oral steroid, 22.5% though the difference was not statistically significant ( $p = 0.149$ ). No major side effects occurred in local steroid group except 5% depigmentation in injected area. In oral steroid group 9% nausea, 7% epigastric pain, 8% bloating and 3% had insomnia cases. **Conclusion:** In conclusion we can say that, superiority of local steroid injection to oral steroid in the treatment of CTS.

**KEYWORDS:** Carpal tunnel syndrome (CTS). local steroid injection. oral steroid.**INTRODUCTION**

Carpal tunnel syndrome (CTS) is the commonest form of entrapment neuropathy. Currently, injection with corticosteroids is one of the many recommended treatments and one of the most studied treatment modalities. Where local steroid injection is one of the treatments used in patients with idiopathic carpal tunnel syndrome (CTS). Although the exact mechanism of action of steroid injection for treating CTS is unknown, its short-term efficacy in reducing symptoms has been established.<sup>[1-2]</sup> A 2018 systematic review reported strong evidence that local steroid injection was more effective than placebo at 8 weeks after treatment but that evidence regarding long-term efficacy was lacking. A 2018 randomized clinical trial of CTS in primary care showed short-term advantages of steroid injection compared with wrist splinting. However, there have been reports of efficacy of oral steroids in the literature, but

few studies comparing the efficacy of local steroid injection with the systemic route.<sup>[3-5]</sup>

In this study our main goal is to evaluate the efficiency of local corticosteroid with oral corticosteroid in reducing CTS symptoms by symptoms severity score and functional status score.

**OBJECTIVE**

- To evaluate the efficiency of local corticosteroid with oral corticosteroid in reducing CTS symptoms.

**METHODOLOGY**

This was a randomized controlled clinical trial carried out in the Department of Neurology, Bangabandhu Sheikh Mujib Medical University (BSMMU) starting from July 2020 to June 2021. A total of 80 patients attending the outpatient of Department of Neurology,

BSMMU, designated as clinically suspected CTS and established by electrophysiological parameters and treated in two groups. One group, n=40 received Injection Triamcinolone 30 mg close to carpal tunnel once in a month and other group, n=40 received oral steroids for one month. Patients who are idiopathic and age in between 34 to 70 years were included in the study. Patients with symptoms less than 3 months and who has CTS-like condition such as cervical radioculopathy, proximal median neuropathy or significant polyneuropathy and with hypothyroidism, diabetes mellitus, pregnancy, cognitive impairment, vibrating tool users, muscle wasting and with recent peptic ulcer disease or history of steroid intolerance were excluded from the study.

Selected subjects were randomly assigned to local steroid injection and oral steroid group. All relevant information from history, clinical examination and investigations were collected in a semi-structured data collection sheet. Collected data were processed and analyzed by using computer based software, statistical package for Social Science (SPSS).

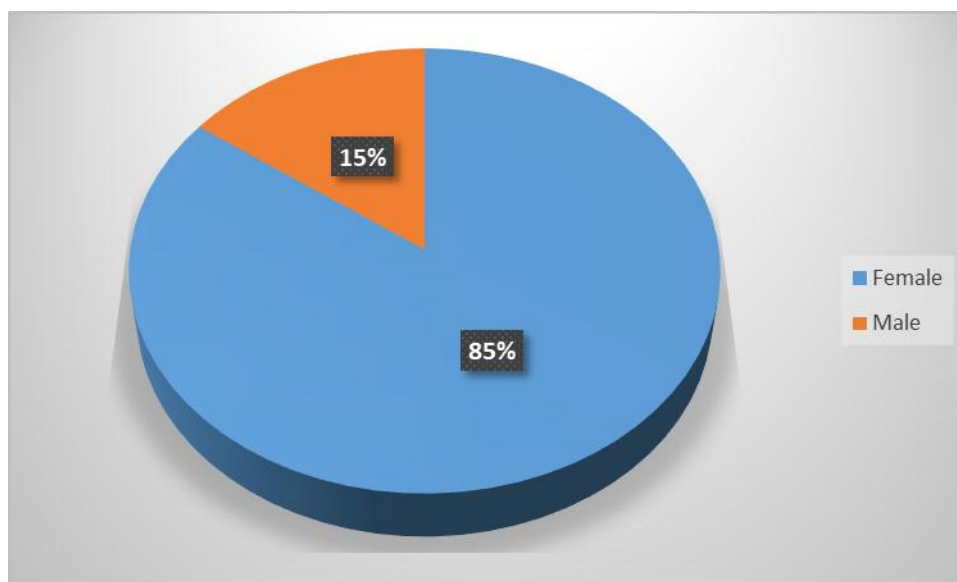
## RESULTS

In table-1 shows age distribution of the study group where in both group majority were belonging to 45-55 years age group, 65% and 60% in local steroid and oral steroid. Followed by in local steroid 10% belong to 34-44 years group and 25% belong to >55 years age group. Whereas in oral steroid, 15% belong to 34-44 years group and 30% belong to >55 years age group. The following table is given below in detail.

**Table 1: Age distribution of the patients.**

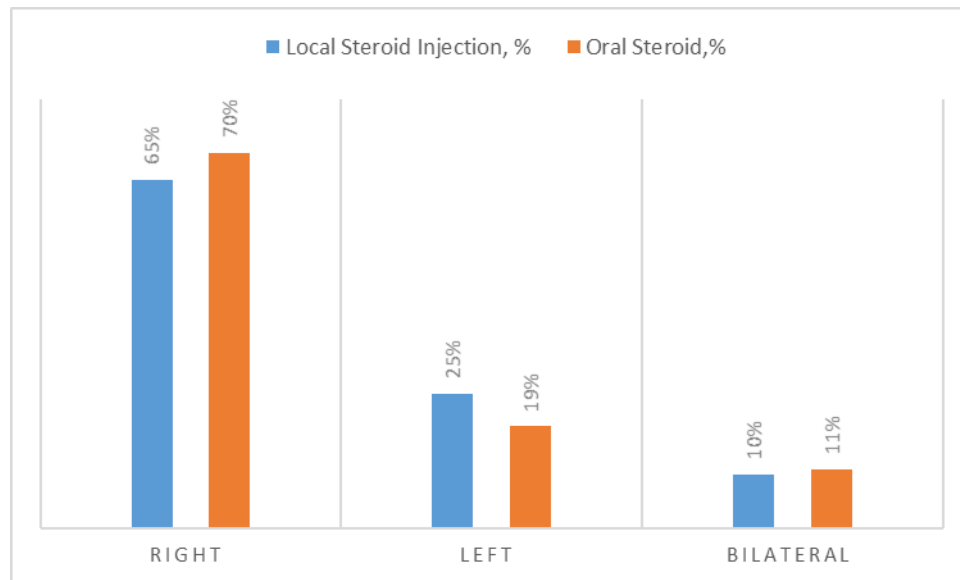
Age group	Local Steroid Injection, %	Oral Steroid, %
34-44 years	10%	15%
45-55 years	65%	60%
>55 years	25%	30%

In figure-1 shows gender distribution of the patients where 85% were female. The following figure is given below in detail.



**Figure 1: Gender distribution of the patients.**

In figure-2 shows Location of carpal tunnel syndrome where there is no significant difference was observed between both groups, in both group, right side was mostly affected 65% in in local Steroid Injection group, and 70% in oral steroid group. The following figure is given below in detail.



**Figure 2: Location of carpal tunnel syndrome.**

In table-2 shows difference in clinical scores in patients evaluation of outcome at month 3 revealed that symptoms severity score and functional status score reduced significantly in both the study groups from their baseline figures ( $p < 0.001$ ). However, in local steroid injection group, symptoms were greatly reduced than those who received oral steroid. The following table is given below in detail.

**Table 2: Changes in clinical scores in both groups following intervention.**

Scores	Local Steroid Injection			Oral Steroid		
	Before intervention	After intervention	p-value#	Before intervention	After intervention	p-value#
	(n = 40)	(n = 40)		(n = 40)	(n = 40)	
Symptoms severity score <sup>i</sup>	25.9 ± 5.5	16 ± 4.2	< 0.001	32.5 ± 4.1	29.1 ± 3.2	< 0.001
Functional status score <sup>i</sup>	29.8 ± 2.1	11 ± 2.6	< 0.001	23.1 ± 2.9	20.6 ± 2.8	< 0.001

<sup>i</sup> Data was analyzed using Paired t-Test and were presented as Mean ±SD.

In table-3 shows Changes in electrophysiological parameters in both groups following intervention. Regarding electrophysiological parameters in local steroid group DML and DSL at wrist were reduced,

while CMAP and SNAP were increased significantly at month 3 from their baseline figures ( $p < 0.001$ ,  $p < 0.001$ ,  $p < 0.001$   $p = 0.009$  respectively). The following table is given below in detail.

**Table 3: Electrophysiological parameters in both groups following intervention.**

	Before intervention	After intervention	P-value#	Before intervention	After intervention	P-value#
	(n = 30)	(n = 30)		(n = 30)	(n = 30)	
	DML (ms)	7.7 ± 2.09		6.2 ± 1.54	< 0.001	
CMAP (mV)	7.1 ± 2.1	8.9 ± 2.19	< 0.001	8.56 ± 3.05	7.7 ± 3.3	0.123
MNCV (m/s)	51.2 ± 3.7	52.1 ± 3.2	0.71	51.78 ± 3.97	51.01 ± 3.1	0.263
DSL at wrist (ms)	3.30 ± 1.2	2.6 ± 1.9	< 0.001	2.95 ± 1.21	2.91 ± 1.1	0.400
SNAP at wrist (µV)	15.2 ± 10.2	17.2 ± 10.5	0.007	13.7 ± 6.5	12.9 ± 6.4	0.067

In table-4 shows Clinical outcome after 3 months intervention in patients where Relief from nocturnal awakening was also appreciably higher in the steroid injection receivers (70%) than that in the oral steroid receivers (5%). Symptoms severity score and functional status score were also at much lower level in the former

group than those in the latter group ( $p < 0.001$  and  $p < 0.001$  respectively). Relief of numbness was considerably higher in the steroid injection, 37.5% than that in the oral steroid, 22.5% though the difference was not statistically significant ( $p = 0.149$ ). The following table is given below in detail.

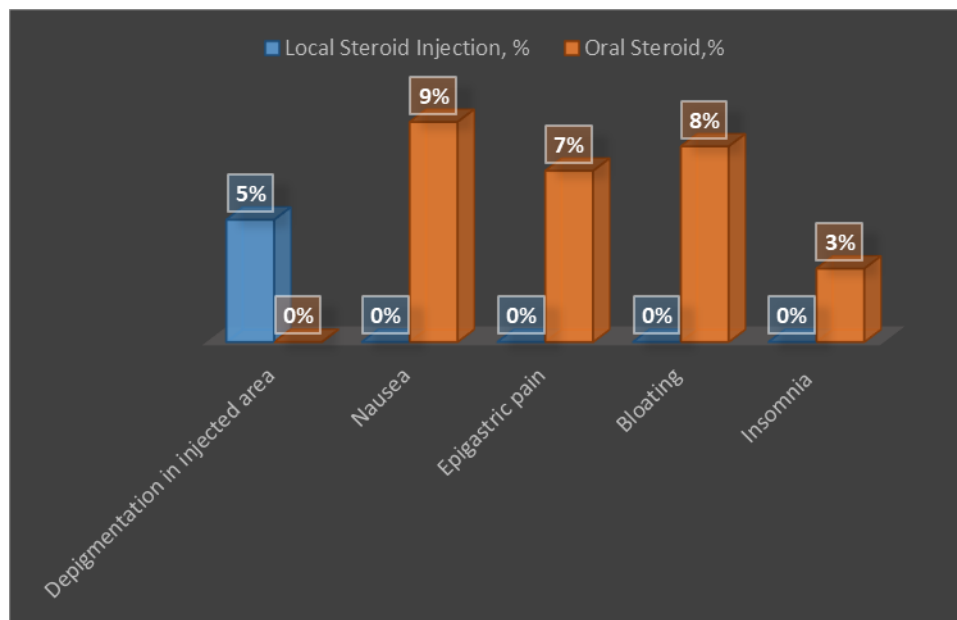
**Table-III: Clinical outcome 3 months after intervention.**

Outcome variables	Local steroid injection	Oral steroid	p-value#
	(n = 30)	(n = 30)	
Relief of tingling†	33 (82.5%)	5 (5%)	< 0.001
Relief of numbness#	15 (37.5%)	9(22.5%)	0.149
Relief from nocturnal awakening#	28 (70%)	2 (5%)	< 0.001
Symptom severity score¶	17.1 ± 2.26	29.7 ± 3.85	< 0.001
Functional status score¶	11.3 ± 3.6	19.6 ± 3.84	< 0.001

# Data was analyzed using Ç2 Test; †Data was analyzed using Fisher's Exact Test;

¶Data was analyzed using Student's t-Test and was presented as Mean ± SD.

In figure-2 shows side effect after intervention where no major side effects occurred in local steroid group except 5% depigmentation in injected area. In oral steroid group 9% nausea, 7% epigastric pain, 8% bloating and 3% had insomnia cases. The following figure is given below in detail.



**Figure 2: Side effects after intervention.**

## DISCUSSION

Our study shows that local steroid injection was superior to oral corticosteroids over a 3-month period in patients with CTS. The age and sex distribution of the studied population corresponds with the data reported in the literature, and there was no difference in comparison between the two groups on the demographic parameters (not shown). Despite the widespread use of corticosteroids injection into the carpal tunnel in CTS, there are actually few randomized controlled trials in confirming its usefulness.<sup>[6-7]</sup> The only controlled trial comparing the effect of local and systemic steroid route was in favor of the local route,<sup>[8]</sup> but the dose of systemic steroids used by intramuscular injection was much

smaller than in our study. In some way one study confirms the efficacy of steroid injections in the treatment of CTS. Moreover, the duration of efficacy (at least 12 weeks) was also impressive and is in keeping with a recent report<sup>[9]</sup> This cannot be accounted for by the half-life of local steroid, whereas the oral steroid group was only effective for up to 8 weeks from intragroup analysis.

Moreover, in our study, relief from nocturnal awakening was also appreciably higher in the steroid injection receivers (70%) than that in the oral steroid receivers (5%). Symptoms severity score and functional status score were also at much lower level in the former group

than those in the latter group ( $p < 0.001$  and  $p < 0.001$  respectively). Relief of numbness was considerably higher in the steroid injection, 37.5% than that in the oral steroid, 22.5% though the difference was not statistically significant ( $p = 0.149$ ). Whereas similar results has been shown in one study where relief from nocturnal awakening was also appreciably higher in the steroid injection receivers (80%) than that in the oral steroid receivers (10%).<sup>[10]</sup>

Both treatment groups were associated with minimal steroid side effects. In local steroid group except 5% depigmentation in injected area. In oral steroid group 9% nausea, 7% epigastric pain, 8% bloating and 3% had insomnia cases. Which was supported by other study.<sup>[11]</sup> However, no withdrawals were noted.

Because CTS is primarily a symptomatic disorder, we used selfassessment by masked patients through the GSS as the primary outcome measure in this study, although the patient-oriented outcomes do not always progress as neurophysiologic measures do.<sup>[12-14]</sup> This study showed a clear benefit from steroid injection versus oral steroid in the treatment of CTS.

## CONCLUSION

In conclusion we can say that, superiority of local steroid injection to oral steroid in the treatment of CTS.

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