Scholars Journal of Applied Medical Sciences (SJAMS)
Abbreviated Key Title: Sch. J. App. Med. Sci.
ISSN 2320-6691 (Online)
ISSN 2347-954X (Print)

A Unit of Scholars Academic and Scientific Society, India
www.saspublishers.com

Neurophysiology

Carpel Tunnel Maximally Presents to Neurophysiology Diagnosis at Moderate Severity

Dr. Virendra Verma, Dr. Gaurav Jain*
Associate Professor, G. R. Medical College, Gwalior, MP, India

Original Research Article

***Corresponding author**
Dr. Gaurav Jain

Article History
Received: 23.05.2018
Accepted: 11.06.2018
Published: 30.06.2018

DOI:
10.36347/sjams.2018.v06i06.018

Abstract: Carpel Tunnel Syndrome (CTS) occurring due to median nerve entrapment at wrist can be neurophysiologically graded in to severity scales. Severity Grading scales for CTS are designed on nerve conduction study (NCS) parameters. Our aim was to analyze retrospectively last 4 yr CTS patients reported at Gajara Raja Medical College, Gwalior (M.P.). 52 neurophysiologically diagnosed CTS patients, aged 30 - 82 years, reported between Jan 2014 and March 2018 were analyzed. NCS parameters of total 104 hands were included in the analysis. Subjects were analyzed according to Jeremy D Bland CTS severity grading scale. Subjects were grouped in to <30 yr, 30-50 yr, 50-70 yr and >70 yr age groups. CTS was higher in females where 41 (78.85%) were females while 11 (21.15%) were males, with male: female ratio of 1:3.7. Maximum patients were in the age group of 30-50 years (37; 71.15%). Of the Total CTS patients 35 (67.31%) were bilateral. Maximum numbers of patients were of moderate severity (28; 53.85%). Out of total evaluated 104 hands severity grade, maximum number of 41 (39.42%) hands showed moderate grade of severity. CTS occurrence was more common in females and most common age group was 30-50 Yr. More CTS cases were diagnosed bilaterally than unilaterally. The maximum cases come to neurophysiology diagnosis at the stage of moderate severity.
Keywords: Carpel Tunnel Syndrome (CTS); Nerve Conduction Study (NCS), Neurophysiology, Median nerve neuropathy.

INTRODUCTION

Compression of the median nerve at the wrist, also referred as "carpal tunnel syndrome" (CTS), is one of the most common peripheral neuropathies [1]. Clinically it presents as tingling in the first three and half fingers that are worst during the night or in the morning, and get relieved by hand shaking [2, 3]. CTS is best confirmed neurophysiologically by nerve conduction studies (NCS) [3, 4].

The grading system has been designed by various authors for grading the severity of CTS [5, 6]. However the grading scale of Jeremy D Bland is acceptable worldwide and used by many authors [6-9].

Our aim was to retrospectively analyze the severity of CTS in bilateral median nerves of the patients on the basis of this scale.

METHODS

The study was conducted at Gajara Raja Medical College (GRMC), Gwalior, India. In this study retrospective analysis of 52 cases with the diagnosis of CTS diagnosed at Neurophysiology Laboratory of G. R. Medical College, Gwalior from Jan 2014 to March 2018 were reviewed and analyzed. The data related to age & sex of the patients and neurophysiological diagnostic parameters of 104 hands were obtained.

Four age groups of <30 yr, 30-50 yr, 50-70 yr and >70 yr were made for age group analysis of CTS patients.

The patients were analyzed according to severity grading scale of CTS designed by Jeremy D Bland [6]. This scale is as follows:

- Normal (grade 0);
- Very Mild (Grade 1)- CTS demonstrable only with most sensitive tests;
- Mild (Grade 2)- sensory nerve conduction velocity slow on finger/wrist measurement, normal terminal motor latency;
- Moderate (Grade 3)- sensory potential preserved with motor slowing, distal motor latency to abductor pollicis brevis (APB) < 6.5 ms;

- Severe (Grade 4)- sensory potentials absent but motor response preserved, distal motor latency to APB < 6.5 ms;
- Very Severe (Grade 5)- terminal latency to APB > 6.5 ms;
- Extremely Severe (Grade 6)- sensory and motor potentials effectively unrecordable (surface motor potential from APB < 0.2 mV amplitude).

RESULTS

Out of 52 selected patients, 41 (78.85%) were females and 11 (21.15%) were males. The patient's age ranged from 30 to 82 yr with mean age of 46.52 ± 10.61 yr. The mean ages of male and female patients were 50.27 ± 14.81 yr (36-82 yr) and 45.51 ± 9.15 yr (30-62 yr), respectively. The male to female ratio was 1: 3.7 with female preponderance.

Maximum number of the cases were in the 30-50 yr age group (37; 71.15%), followed by 50-70 yr age group (13; 25%). No case of CTS presented with age <30 yr and only two cases were observed above 70 yr age (Table-1).

35 (67.31%) cases were having bilateral CTS, while 17 (32.69 %) cases had unilateral CTS (Table-2).

Severity grading of the patients was done on the basis of more symptomatic hand. Maximum number of cases presented to Neurophysiology Laboratory with moderate severity (28; 53.85%) (Table-3 and Figure-1). Similarly on analyzing each hands severity grade, maximum numbers of hands were observed in moderate grade (41; 39.42%).

Table-1: Age and sex wise distribution of CTS patients

S. No.	Age Groups	Males	Females	Total (% of Total)
1	**<30 Yrs**	0	0	0 (0.00%)
2	**30-50 Yrs**	8	29	37 (71.15%)
3	**50-70 Yrs**	1	12	13 (25.00%)
4	**>70 Yrs**	2	0	02 (3.85%)
Total		**11**	**41**	**52**

Table-2: CTS presentation- Bilateral Vs Unilateral

CTS Presentation	Males	Females	Total (% of Total)
Bilateral	7	28	35 (67.31%)
Unilateral	4	13	17 (32.69%)
Total	**11**	**41**	**52**

Table-3: Severity Grading of Patients based on more symptomatic hand

Severity Grade	Male	Female	Total (% of Total)
Very Mild (Grade 1)	1	5	6 (11.54%)
Mild (Grade 2)	3	5	8 (15.38%)
Moderate (Grade 3)	4	24	28 (53.85%)
Severe (Grade 4)	1	1	2 (3.85%)
Very Severe (Grade 5)	2	6	8 (15.38%)
Extremely Severe (Grade 6)	0	0	0 (0.00%)
Total	**11**	**41**	**52**

Table-4: Severity Grading of CTS in each hand of patients

Severity Grade	Males (n=11)		Females (n=41)		Total (% of Total)
	Right Hand	Left hand	Right Hand	Left Hand	
Normal (Grade 0)	2	2	5	8	17 (16.35%)
Very Mild (Grade 1)	1	1	3	9	14 (13.46%)
Mild (Grade 2)	4	3	8	6	21 (20.19%)
Moderate (Grade 3)	2	4	22	13	41 (39.42%)
Severe (Grade 4)	0	1	2	0	3 (2.88%)
Very Severe (Grade 5)	2	0	1	5	8 (7.69 %)
Extremely Severe (Grade 6)	0	0	0	0	0 (0.00%)
Total	**11**	**11**	**41**	**41**	**104**

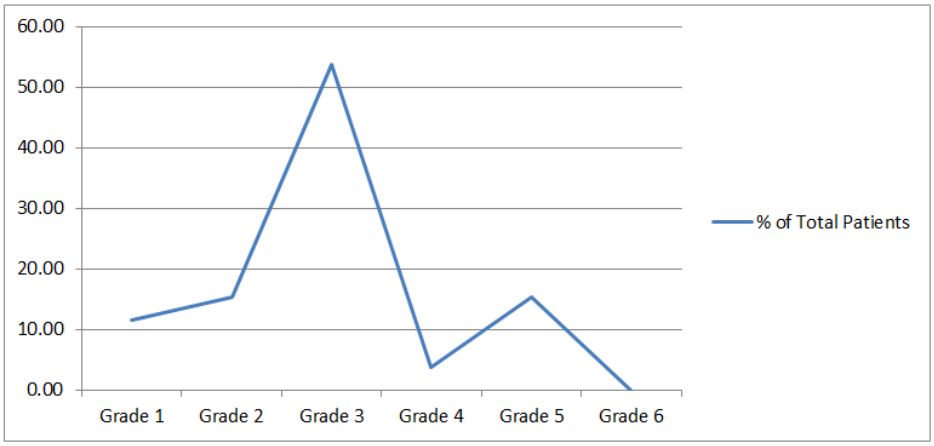

Fig-1: Percentage of CTS cases according to Severity Grading of Patients (based on more symptomatic hand)

DISCUSSION

This study retrospectively analyzed the neurophysiologically diagnosed CTS patients from April 2014 to March 2018. In this study female preponderance was observed where female cases were nearly four times that of males (Male: Female ratio 1:3.7). This female preponderance is observed in most of the previous studies [1, 9-11].

Commonest presenting age for CTS was between 30-50 yr with the mean age of presentation 46.52 ± 10.61 yr. Most of the studies found the CTS mean age near to our patients [9-11].

We observed bilateral CTS cases more than the unilateral cases. Other studies have also observed the similar findings [11, 12]. This indicates that there is anatomical variations in structure of carpel tunnel of some individuals which may be the cause of occurrence of carpel tunnel syndrome [4, 13].

We observed that the majority of cases presented to NCS were having moderate grade of severity (Grade 3), and none presented as extremely severe case. This indicates that individuals ignore minor symptoms and get medical advice at moderate severity and hence none reaching to extremely severe stage.

CONCLUSION

Thus we concluded that CTS occurrence was more common in females with most common age group of presentation between 30 to 50 yr. More patients come with bilateral CTS. The maximum number of patients present at the stage of moderate severity.

REFERENCES

1. Aroori S, Spence RA. Carpal tunnel syndrome. The Ulster medical journal. 2008 Jan;77(1):6-17.
2. Atroshi I, Gummesson C, Johnsson R, Ornstein E, Ranstam J, Rosén I. Prevalence of carpal tunnel syndrome in a general population. Jama. 1999 Jul 14;282(2):153-8.
3. Podnar S. Protocol of neurophysiologic studies in the carpal tunnel syndrome. Zdravniski Vestnik. 2009 Nov 1;78(11).
4. Werner RA, Andary M. Carpal tunnel syndrome: pathophysiology and clinical neurophysiology. Clinical Neurophysiology. 2002 Sep 1;113(9):1373-81.
5. Mustafa ME, Abdalla SF. Neurophysiologic Pattern and Severity Grading Scale of Carpal Tunnel Syndrome in Sudanese Patients. Journal of Neurology and Neuroscience. 2017 Aug 25;8(4).
6. Bland JD. A neurophysiological grading scale for carpal tunnel syndrome. Muscle & nerve. 2000 Aug 1;23(8):1280-3.
7. Padua L, LoMonaco M, Gregori B, Valente EM, Padua R, Tonali P. Neurophysiological classification and sensitivity in 500 carpal tunnel syndrome hands. Acta Neurologica Scandinavica. 1997 Oct 1;96(4):211-7.
8. Bland JD. Treatment of carpal tunnel syndrome. Muscle & nerve. 2007 Aug 1;36(2):167-71.
9. Tay LB, Urkude R, Verma KK. Clinical profile, electrodiagnosis and outcome in patients with carpal tunnel syndrome: a Singapore perspective. Singapore Med J. 2006 Dec;47(12):1049-52.
10. Gelfman R, Melton L3, Yawn BP, Wollan PC, Amadio PC, Stevens JC. Long-term trends in carpal tunnel syndrome. Neurology. 2009 Jan 6;72(1):33-41.
11. Mondelli M, Giannini F, Giacchi M. Carpal tunnel syndrome incidence in a general population. Neurology. 2002 Jan 22;58(2):289-94.
12. Ibrahim I, Khan WS, Goddard N, Smitham P. Suppl 1: Carpal Tunnel Syndrome: A Review of the Recent Literature. The open orthopaedics journal. 2012;6:69.
13. Chammas M, Boretto J, Burmann LM, Ramos RM, Neto S, Silva JB. Carpal tunnel syndrome-Part I (anatomy, physiology, etiology and diagnosis). Revista brasileira de ortopedia. 2014 Oct;49(5):429-36.