

A Study of Carpal Tunnel Syndrome Among Regular Computer Users and Effect of Yogic Exercises in Them



Medical Science

KEYWORDS : CTS, Computer users, MNCV, Yoga.

* DR. SUBHALAKSHMI.S

Assistant Professor, Dept of Physiology, Omandurar medical college, Chennai
* CORRESPONDING AUTHOR

DR.SUJATHA.B

Associate Professor, Dept of Physiology, Tirunelveli medical college, Tirunelveli

ABSTRACT

Background: Computer use is increasingly common among working population. Long term computer users are at increased risk for carpal tunnel syndrome (CTS). Yoga and relaxation techniques have been used to reduce the risk of CTS. 1. To find out the distribution and assessment of CTS by measurement of motor nerve conduction velocity (MNCV) in median nerve. 2. To study the effectiveness of yogic exercises. **Materials and methods:** This is a cross-sectional study followed by an intervention. regular computer users (10 to 15 hours/week) in the age group between 20 to 40 years with symptoms of CTS were subjected to MNCV before and after intervention of yogic exercises. **Results:** Distribution of CTS was 38% which was higher among females. MNCV in median nerve has shown improvement after yoga. **Conclusion:** This study stressed upon the importance of yoga among regular computer users to improve their work performance.

INTRODUCTION

Computer use is increasingly common among working populations. Computers are one of the main tools in offices, businesses and educational systems (Blehm C et al 2005). On one hand they have made lives so much easy but on the other hand have created many health related problems. Several studies suggested that long term computer users are at increased risk for carpal tunnel syndrome (LicCW et al 2003) and other work related musculoskeletal disorders (MSD) of the upper extremities (Jones CS et al 1998).

CTS is the syndrome which occurs due to compression of median nerve within the carpal tunnel (BerwaldJM et al 2004). Any delay in diagnosing this condition results in permanent nerve damage. Hence, it is very important to diagnose this condition at an early stage and we can treat as early as possible and also restore the normal use of hands and wrist. Traditionally these computer related health disorders have been treated with wrist splint, anti-inflammatory agents, steroids and surgery. However, these options have provided less satisfactory relief. Hence, to some extent the risk of CTS can be reduced by proper adjustment of work station (ParcarelliE et al 1994). Yoga and relaxation technique have been used to reduce the MSD (Iyengar BKS et al 1968) and these non-pharmacological strategies if applied to regular computer users provide a positive impact on their muscle strength.

AIMS AND OBJECTIVES

1. To find out the distribution of CTS among regular computer users.
2. To assess the CTS by measurement of motor nerve conduction velocity (MNCV) in median nerve.
3. To study the effectiveness of yogic exercises and relaxation techniques in the improvement of CTS.

MATERIALS AND METHODS

This is a cross-sectional study followed by an interventional study and this study was approved by Ethical Committee of Tirunelveli Medical College. This study was conducted in Monet Computer Centre, Tirunelveli. The study period was 6 months which extended from February 2015 to July 2015. About 100 computer users, both male and female in the age group between 20 to 40 years were included in the study.

Inclusion criteria:

- Regular computer users (10 to 15 hours/week) who have been in the same job for continuous twelve months.
- Age group between 20 to 40 years.

Exclusion criteria:

- Any physical deformity of the upper limbs and neck which prevents the performance of the tasks,
- Previous history of trauma, diabetes mellitus, thyroid disease,
- Subjects with previously diagnosed neuropathy.

Written informed consent was obtained from the study group. They were provided with Boston Carpal Tunnel Questionnaire which has to be answered. Then, distribution of CTS was diagnosed in 38% of study population based on the questionnaire and they were subjected to measurement of MNCV in median nerve by using Computerized RMS EMG EP MARK II equipment. Then the subjects were instructed to practice yogic exercises daily for half an hour in the morning as well as in the evening. Total period of this intervention was six months. After end of this follow up study, MNCV was recorded and the results were tabulated, compared with pre test findings and statistical analysis was done. To compare quantitative variable of group before and after the intervention "paired t test" was used and difference between groups were considered as statistical significant at $p < 0.05$.

RESULTS

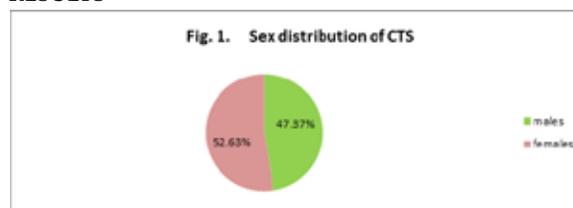


TABLE – 1: Symptoms and signs of CTS

Symptoms and signs	No. of participants with CTS	Percentage
Hand weakness	06	15.78%
Tingling	04	10.52%
Numbness	10	26.31%

Hand / wrist pain	34	89.47%
Nocturnal exacerbations	04	10.52%
Difficulty in holding things	03	7.89%
Thenar muscle wasting	01	2.63%

Out of 38 participants with CTS, the most common symptom was hand / wrist pain (89.47%) followed by numbness (26.31%), hand weakness (15.78%), nocturnal exacerbations (10.52%), tingling (10.52%), difficulty in holding things (7.89%) and thenar muscle wasting (2.63%).

TABLE 2: Distribution of CTS

No of participants with CTS		Percentage %
Males	18	47.37%
Females	20	52.63%
Total	38	100%

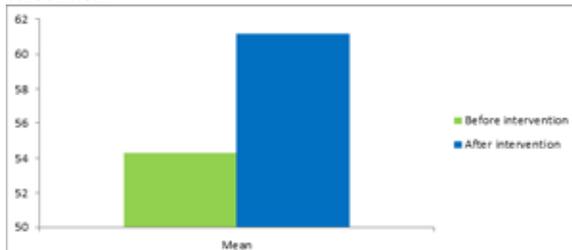
Out of 38 participants with CTS, prevalence rates were found to be more in females than in male

TABLE 3 : MNCV in median nerve before and after intervention

MNCV (mt/sec)	Before intervention	After intervention
Mean	54.301	61.216*
SD	2.402	2.691*

*P value < 0.05 –statistically significant.

FIGURE : 2 MNCV in median nerve before and after intervention



DISCUSSION

Increasing use of computers has brought about the development of various health concerns. These health concerns resulting from poorly designed workstations, prolonged physical inactivity, poor seating posture are a growing trend in the workplace. Using alternative techniques like yoga and exercises can prevent development of these health related problems (Keir PJ et al-Effect of computer mouse design. *Ergonomics* 42; 1350-1360). The BCTQ Questionnaire was used (SenA et al 2007). In this study prevalence of CTS was 38% (Sheman KJ et al 2005). So this study proved the effectiveness of yogic exercises on relaxation of muscles and ligaments.

In the present study, the MNCV has shown better improvement after yogic intervention (Jaggi et al 1990). The symptom severity score and functional status score was analyzed before and after intervention and there was significant reduction in the score at the end of the study (Vidya S Joshi et al 2011). Among the participants, increased working hours were associated with a reduced median motor nerve conduction velocity (AA Ganerwal et al 2013). The reason for this is due to the continuous physical stress imposed

upon the nerve fibres with long working hours. In the present study, prevalence of CTS was higher among females when compared to males (De krom MC et al 1992). This could be due to the crowded carpal bones and narrow carpal tunnel present in females.

CONCLUSION

Carpal Tunnel Syndrome is a common disorder among long term computer users. Yogic exercises help to reduce these problems. Yogic exercises among regular computer users will improve their work performance and protect them from complications of computer usage.

Reference

- BlehmC, Vishnu. S.KhattakA, MithaS, YeeRW. Computervisionsyndrome: a review. *Surv Ophthalmol* 2005;50(3): 253-262
- LicCW, ChenTW, WangMC, ChenCH, Lee CL, Huang MH. Relationship between carpal tunnel syndrome and wrist angle in computer workers. *Kaobsiung J Med Sci* 2003;19:617-623.
- Jones CS, Orrb. computer related musculoskeletal pain and discomfort among high school students. *Am J Health Studies* 1998;14:26-30.
- BerwaldJM. Carpal tunnel syndrome. Bethesda: National Institute of Arthritis and skin diseases (NIAMS). Available from: URL: <http://www.answers.com/topic/carpal-tunnel-syndrome.13/08/2004>
- ParcarellIE, QuilterD. Repetitive strain injury: A computer users guide. New York: John Wiley & Sons Inc; 1994.
- Iyengar BKS. Light on yoga. London: George Alien & Unwin Ltd; 1968.
- Keir PJ, Bach JM, Effect of computer mouse design and task on carpal tunnel pressure. *Ergonomics* 42: 1350-1360.
- A Sen, Stanley Richardson, a study of computer related upper limb discomfort and computer vision syndrome, *J.HumanErgol.*, 36:45-50, 2007.
- Sheman KJ, Cherkin DC, ErroJ, MegliorettilDL, Deyo RA. Comparing yoga, exercise and self care book for chronic low back pain. *Amm Intern Med* 2005;143(12): 849-56.
- Jaggi O.P. Yogic and Tantric Medicine Vol.5 New Delhi: Atmaran and sons; 1990.
- Vidya S Joshi, Anjana S Bellad, Effect of yogic exercises on symptoms of musculoskeletal disorders of upper limbs among computer users: a randomized controlled trial, *Indian J Med Sci* 2011, oct;65(10): 424-8.
- AA Ganerwal, DA Biswas, The effects of working hours on nerve conduction test in computer operators, *Malays orthop J*. 2013 Mar;7(1):1-6.
- De Krom MC, KnipschildPG, Kester AD, Thijs CT, Carpal tunnel syndrome – prevalence in general population. *J ClinEpidemiol.* 1992;45(4):373-6.