

## A Study of Forty Patients of Carpal Tunnel Syndrome

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### Abstract:

**Background:** Carpal Tunnel Syndrome (CTS) can be associated with any condition that causes pressure on the median nerve at the wrist. Some speculate that carpal tunnel syndrome is provoked by repetitive movement and manipulating activities and that the exposure can be cumulative. The relationship between BMI, body fat and CTS is due to increased fat deposition in the carpal canal or higher hydrostatic pressure in the carpal tunnel in obese subjects compared to normal or slender individuals. CTS will be common in those who are frequent users of the keyboard, but in societies where livelihood is dependent on agricultural activities, it will be common in those who have to perform manual labour. **Objective:** The general goal of the study is to find out the particular diagnostic characteristic of carpal tunnel syndrome patients in the Bangladeshi population. **Methodology:** The study was a cross sectional type of descriptive study and total sample was 40. **Results:** In this study excessive physical activity is suspected to be the important predisposing factor for development of CTS in these patients so obesity would definitely be uncommon in this group of patients.

**Key words:** Carpal tunnel syndrome, BMI, Hydrostatic pressure, Cross sectional type

Date of Submission: 12-03-2018

Date of acceptance: 28-03-2018

### I. Introduction

Carpal tunnel syndrome (CTS) is the most commonly reported nerve entrapment syndrome. Carpal tunnel syndrome (CTS), with a prevalence of 3.8% in the general population, is the most common compressive neuropathy of the upper limbs, and the carpal tunnel release (CTR) is an effective treatment to decompress median nerve by division of the transverse carpal ligament. Carpal Tunnel Syndrome (CTS) is the compression of the median nerve traveling through the carpal tunnel.<sup>[1]</sup> The carpal tunnel is an anatomical compartment located at the base of the wrist. Nine flexor tendons and the median nerve pass through the carpal tunnel that is surrounded on three sides by the carpal bones that form an arch. Numbness, tingling or burning sensations in the thumb and lateral fingers are caused by carpal tunnel syndrome which is a neurological disorder. Men are three times less likely than women to develop carpal tunnel syndrome, perhaps because the carpal tunnel itself may be smaller in women than in men. Mostly Caucasians have the frequently highest risk of being diagnosed with CTS compared with other races such as non-white South Africans.



Figure 1a and 1 b: Symptom of CTS

CTS was most commonly heard of in the years following WWII. CTS is thought to be an overuse injury to the flexor tendons running through the carpal tunnel. The outer sheath or covering of the tendons is originally smooth, though through the repetitive movement over the carpals causes damage to the tendon sheaths and creates swelling leading to median nerve entrapment. Other causes of CTS are obesity, hypothyroidism, arthritis, diabetes, and trauma. Most of the cases the causes of CTS are unknown or idiopathic. This study will provide us with data on the characteristics of patients of CTS in the Bangladeshi population.

### **Carpal Tunnel Syndrome:**

Carpal Tunnel Syndrome (CTS) is an idiopathic median neuropathy at the carpal tunnel. The pathophysiology is not completely understood but can be considered compression of the median nerve traveling through the carpal tunnel. The causes of CTS are not fully understood. The National Center for Biotechnology Information and highly cited older literature (Silverstein B, Fine L, Armstrong T 1987) say the most common cause of CTS is typing.<sup>[2]</sup> The main symptom of CTS is intermittent numbness of the thumb, index, long and radial half of the ring finger.<sup>[3]</sup> The numbness usually occurs at night because we tend to sleep with our wrists flexed and is relieved by wearing a wrist splint that prevents flexion. Long-standing CTS leads to permanent nerve damage with constant numbness, atrophy of some of the muscles of the thenar eminence, and weakness of palmar abduction.<sup>[4]</sup> Palliative treatments for CTS include use of night splints and corticosteroid injection. The only scientifically established disease modifying treatment is surgery to cut the transverse carpal ligament (Bickel Kyle D 2010).

### **Symptoms:**

#### **Untreated Carpal Tunnel Syndrome:**

Patients with CTS experience numbness, tingling, or burning sensations in the thumb and fingers, particularly the index, middle fingers, and radial half of the ring fingers which are innervated by the median nerve. Less specific symptoms may include pain in the hands or wrists and loss of grip strength (both of which are more characteristic of painful conditions such as arthritis).<sup>[5]</sup> Numbness and paresthesias in the median nerve distribution are the hallmark neuropathic symptoms (NS) of carpal tunnel entrapment syndrome. Weakness and atrophy of the thenar muscles may occur if the condition remains untreated.<sup>[6]</sup>

### **Causes:**

Most cases of CTS are of unknown causes, or idiopathic.<sup>[7]</sup> Carpal Tunnel Syndrome can be associated with any condition that causes pressure on the median nerve at the wrist. Some common conditions that can lead to CTS include obesity, oral contraceptives, hypothyroidism, arthritis, diabetes, and trauma.<sup>[8]</sup> Other causes of this condition include intrinsic factors that exert pressure within the tunnel, and extrinsic factors (pressure exerted from outside the tunnel).<sup>[9]</sup> The relationship between work and CTS is controversial; in many locations, workers diagnosed with carpal tunnel syndrome are entitled to time off and compensation. In the USA, Carpal tunnel syndrome results in an average of \$30,000 in lifetime costs (medical bills and lost time from work).

### **Work related:**

Some speculate that carpal tunnel syndrome is provoked by repetitive movement and manipulating activities and that the exposure can be cumulative. It has also been stated that symptoms are commonly exacerbated by forceful and repetitive use of the hand and wrists in industrial occupations (Werner Robert A. 2006), but it is unclear if this refers to pain (which may not be due to carpal tunnel syndrome) or the more typical numbness symptoms.<sup>[10]</sup>

### **Carpal tunnel syndrome associated with other diseases:**

A variety of patient factors can lead to CTS including heredity, size of the carpal tunnel, associated local and systematic diseases and certain habits contribute to its etiology. Non-traumatic causes generally happen over a period of time, and are not triggered by one certain event. Many of these factors are manifestations of physiologic aging.<sup>[11]</sup>

### **Examples include:**

- Rheumatoid arthritis and other diseases that cause inflammation of the flexor tendons.
- With pregnancy and hypothyroidism, fluid is retained in tissues, which swells the tenosynovium.
- During pregnancy women experience CTS due to hormonal changes (high progesterone levels) and water retention which is common during pregnancy.
- Previous injuries including fractures of the wrist.

**Diagnosis:**

The reference standard for the diagnosis of carpal tunnel syndrome is electrophysiological testing. Patients with intermittent numbness in the distribution of the median nerve along with positive Phalen's, Durkan's and electrophysiological tests have at worst, a very mild case of carpal tunnel syndrome. A predominance of pain rather than numbness is unlikely to be caused by carpal tunnel syndrome no matter what the result of electrophysiological testing.

Clinical assessment by history taking and physical examination can support a diagnosis of CTS.

Symptoms and signs highly suggestive of CTS are: (Preston DC 1992)

- Nocturnal paresthesias awakening patient from sleep.
- Pain/paresthesias associated with holding or driving an object.
- Sensory disturbance of digits 1, 2, 3 & 4, splitting the fourth digit.
- Weakness/wasting of thenar eminence.

**Prevalence:**

Carpal tunnel syndrome can affect anyone. In the U.S., roughly 1 out of 20 people will suffer from the effects of carpal tunnel syndrome. Caucasians have the highest risk of CTS compared with other races such as non-white South Africans (Ashworth Nigel L 2008). Women suffer more from CTS than men with a ratio of 3:1 between the ages of 45–60 years. Only 10% of reported cases of CTS are younger than 30 years.

**Prevention:**

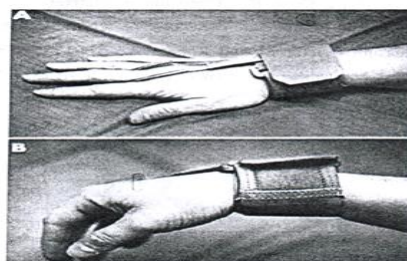
A 2007 study, conducted by Lozano-Calderon et al. in the Department of Orthopaedic Surgery at Massachusetts General Hospital, states that carpal tunnel syndrome is primarily determined by genetics and structure. Therefore, carpal tunnel syndrome is probably not preventable.

However, others think it can be prevented by developing healthy habits like avoiding repetitive stress, practicing healthy work habits like using ergonomic equipment (wrist rest, mouse pad), taking proper breaks, using keyboard alternatives (digital pen, voice recognition and dictation) and early passive treatment like taking turmeric (anti-inflammatory), omega-3 fatty acids, and B vitamins. The persistence of such theories in spite of evidence to the contrary is remarkable. For instance, scientists have long abandoned the potential role of B-vitamins in carpal tunnel syndrome.

**Treatment:**

There have been numerous scientific papers evaluating treatment efficacy in CTS. It is important to distinguish treatments that are supported in the scientific literature from those that are advocated by any particular device manufacturer or any other party with a vested financial interest. Generally accepted treatments, as described below, may include splinting or bracing, steroid injection, activity modification, physiotherapy, regular massage therapy treatments, chiropractic, medications, and surgical release of the transverse carpal ligament.

**Immobilizing braces:**



**Figure 2:**

(A)The Daytimer Splint showing loop around middle finger

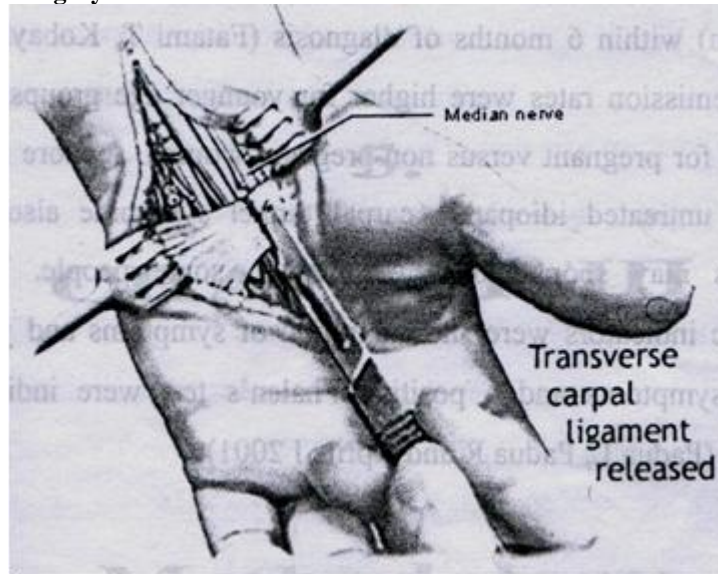
(B) The loop permits only limited wrist flexion yet offers minimal obstruction to the palm and fingers

The importance of wrist braces and splints in the carpal tunnel syndrome therapy is known, but many people are unwilling to use braces. In 1993, The American Academy of Neurology recommends a non-invasive treatment for the CTS at the beginning (except for sensitive or motor deficit or grave report at EMG/ENG): a therapy using splints was indicated for light and moderate pathology. Current recommendations generally don't suggest immobilizing braces, but instead activity modification and non-steroidal anti-inflammatory drugs as initial therapy, followed by more aggressive options or specialist referral if symptoms do not improve.

**Localized corticosteroid injections:**

Corticosteroid injections can be quite effective for temporary relief from symptoms of CTS for a short time frame while a patient develops a longterm strategy that fits with his/her lifestyle.<sup>[12]</sup>

**Carpal tunnel release surgery:**



**Figure-3:** Surgical decompression of the median nerve in the carpal tunnel offers the only means of long term cure of CTS.

Scars from carpal tunnel release surgery. Two different techniques were used. The left scar is 6 weeks old, the right scar is 2 weeks old. Also note the muscular atrophy of the thenar eminence in the left hand, a common sign of advanced CTS.

**Carpal Tunnel Syndrome Operation:**

Release of the transverse carpal ligament is known as "carpal tunnel release" surgery. It is recommended when there is static (constant, not just intermittent) numbness, muscle weakness, or atrophy, and when night-splinting no longer controls intermittent symptoms.<sup>[13]</sup>

**Procedure:**

In carpal tunnel release surgery, the goal is to divide the transverse carpal ligament in two. This is a wide ligament that runs across the hand, from the scaphoid bone to the hamate bone and pisiform. It forms the roof of the carpal tunnel, and when the surgeon cuts across it (i.e., in a line with the ring finger) it no longer presses down on the nerve inside, relieving the pressure.

There are several carpal tunnel release surgery variations: each surgeon has differences of preference based on their personal beliefs and experience. All techniques have several things in common, involving brief outpatient procedures; palm or wrist incision(s); and cutting of the transverse carpal ligament. Open surgery involves an incision on the palm about an inch or two in length and Endoscopic techniques involve one or two smaller incisions (less than half inch each) through which instrumentation is introduced including a synovial elevator, probes, knives, and an endoscope used to visualize the underside of the transverse carpal ligament. Many studies have been done to determine whether perceived benefits of a limited endoscopic or arthroscopic release are significant. Brown et al. conducted a prospective, randomized, multi-center study and found no significant differences between the two groups with regard to secondary quantitative outcome measurements. However, the open technique resulted in more tenderness of the scar than the endoscopic method. A prospective randomized study done in 2002 by Trumble revealed that good clinical outcomes and patient satisfaction are achieved more quickly with the endoscopic method. Single-portal endoscopic surgery is a safe and effective method of treating carpal tunnel syndrome.<sup>[14]</sup>

Many surgeons have embraced limited incision methods. It is considered to be the procedure of choice for many of these surgeons with respect to idiopathic carpal tunnel syndrome. Supporting this are the results of some of the previously mentioned series which cite no difference in the rate of complications for either method of surgery. Balloon Carpal Tunnelplasty is a technique that uses a minimally invasive balloon catheter director to access the carpal tunnel. The director protects the median nerve and contents of the carpal tunnel. Like a

traditional tissue elevator/expander with Balloon Carpal Tunnelplasty the carpal ligament is elevated increasing the space in the carpal tunnel.

**Efficacy:**

Success is greatest in patients with the most typical symptoms. The most common cause of failure is incorrect diagnosis, and it should be noted that this surgery will only mitigate carpal tunnel syndrome, and will not relieve symptoms with alternative causes. Recurrence is rare, and apparent recurrence usually results from a misdiagnosis of another problem. Complications can occur, but serious ones are infrequent to rare.

**Ultrasound treatment:**

Some claim that Ultrasound to the wrist gives significant improvement of symptoms in people with CTS. A treatment process may consist of 20 sessions of 15 minutes of ultrasound applied to the area over the carpal tunnel at a frequency of 1 MHz, and a power of 1.0 W/cm<sup>2</sup>.

**Role of Occupational Therapy:**

**Assessment:**

Tinel's sign and Phalen's tests can be used to assess for CTS. They may be administered by an occupational therapist (OT). Tinel's sign involves tapping at the volar wrist while Phalen's test involves maintaining wrist flexion for 60 seconds. In both tests, a positive sign is indicated by numbness, tingling or pain in the thumb, index and half of the middle finger. Following positive signs, the OT may perform manual muscle testing for grip and pinch strength and assess range of motion (Cooper C 2008). The OT may perform a detailed step-by-step breakdown of what's involved in the activity to look at the specific tasks that could be affected by or be contributing to CTS symptoms.

**Intervention:**

OTs provide protective and corrective non-surgical measures for CTS and focus intervention on the person's physical abilities, environment, and the activities they engage in. OTs who provide intervention for individuals with CTS may also be hand therapists. Bash & Farber state that to become a hand therapist, an individual must be a physical or occupational therapist with at least 5 years experience, including 2000 hours of therapy pertaining directly to hands, and a certification exam is required.<sup>[15]</sup>

**Education:**

OTs play a large role as educators. Education may be provided to an individual client or a group of people. Individuals with CTS or at risk for CTS may benefit from education in the areas outlined below:

- Signs & symptoms of CTS
- Options for treatment: surgical and/or non surgical interventions
- How to reduce risks & decrease symptoms of CTS
- Splint wearing regimen
- Body mechanics & exercises
- Task adaptation

## **II. Objectives of the study**

**General Objective:**

- To find out the particular diagnostic characteristic of carpal tunnel syndrome patients in the Bangladeshi population.

**Specific Objectives:**

- To find out the selected socio-demographic indicative characters of the patients with carpal tunnel syndrome.
- To find out the associated inherent risk factors of CTS patients.
- To correlate the particular clinical features of patients with carpal tunnel syndrome with their etiological basis.
- To perform neurophysiological tests in selected patients who is able to perform the tests.

## **III. Methodology**

**Study type:**

- It was a cross sectional type of descriptive study.

**Place and period of study:**

- The present study was carried out at July 2010 – June 2011 among the patients reporting to out patient departments of Neuromedicine, Medicine and Surgery of Rajshahi Medical College Hospital.

**Sample size:**

As we know the overall incidence of CTS (in USA) is 2.7% of general population (Bradley WG 2004).

Hence,  $n = z^2pq/d^2$ , Where  $z = 1.96$  (95% confidence limit)

$P = 2.7\% = 0.027$ , therefore,  $q = 1 - p = 0.973$ ,  $d = 0.05$

Therefore,  $n = (1.96)^2 \times 0.027 \times 0.973 / (0.05)^2 = 40.36$

Number of sample size ( $n$ ) = 40

**Inclusion criteria:**

Patients fulfilling the symptoms and signs highly suggestive of CTS (Preston DC 1992) in all age groups irrespective of sex.

Symptoms and signs highly suggestive of CTS are : (Preston DC 1992)

- Nocturnal paresthesias awakening patient from sleep.
- Pain/ paresthesias associated with holding or driving an object.
- Sensory disturbance of digits 1, 2, 3 & 4, splitting the fourth digit.
- Weakness/wasting of thenar eminence.

**Sample collection:**

- The patients who fulfilled both the symptoms and sign suggestive of CTS were enrolled in this study.

**Method of data collection:**

- Data was collected by face-to-face interview, physical examination and investigations in a data collection sheet. It was collected after taking informed consent of the patient.

**Statistical Analysis:**

- The data was analyzed with help of SPSS software programme. Descriptive analytical techniques involving frequency distribution, computation of percentage, mean, SD, etc was applied. Association between variables was conducted by applying chi-square test.

**Physical Symptom Management Techniques:**

**Splinting:**

OTs often use wrist splinting as a form of treatment. Splints may be pre-fabricated or custom-fit. Prefabricated splints are sold in health care supply stores and are an inexpensive option for clients.<sup>[16]</sup> Splints can be based on the front (palmar), back (dorsal) or outer side (pinky) of the arm. According to Muller et al systematic review on interventions for CTS, volar cock-up splints and ulnar gutter splints are similar in their improvement of symptoms and function.(Deshaies L D 2008). Splints aim to immobilize the wrist to decrease pressure in the carpal tunnel. Restricting wrist motion eliminates the repetitive movement and tension overload in the carpal tunnel. Although there has been debate about the best angle for wrist immobilization, the authors of a systematic review on non surgical carpal tunnel treatments conclude that “there is limited evidence that the use of a wrist splint in neutral position is more effective than an extended wrist position of 20 degrees in patients with CTS in the short term”.<sup>[17]</sup>

**Modification of Occupation (Task):**

Modification of a task is about adjusting behaviors and actions that may contribute to the development or exacerbation of CTS. As Doheny et al suggest, tasks can be redesigned to include diversity and thus limit repetitive movements that can aggravate CTS. This study also suggests minimizing wrist extension through appropriate body posture at the workstation which may help to reduce carpal tunnel pressure (Keir P J, Bach J M, Rempel D 1999).<sup>[18]</sup> A review of the literature has found evidence supporting the use of exercise and/or rest breaks in reducing musculoskeletal discomfort during computer work. Faucett et al found that people with CTS were more likely to continue with their current jobs if modifications were made to the tasks. Two of these modifications included limiting repetitive tasks and decreasing work time. OT's can provide recommendations on job modifications to reduce risk factors by modifying client's work tasks.

**Modification of Equipment and Tools:**

An important role of OTs is to introduce modified equipment and adaptive aids to enable occupational performance despite physical limitations. Modifying equipment and tools can correct positioning of the hand (e.g. keep it in a more neutral position) and reduce the hand force required to complete an action. Adaptive aids can be useful in enabling individuals with CTS to participate in their chosen activities. One such adaptation is increasing the diameter of handles so that less grip strength is needed to grasp an object (Trombly Latham C A 2008). Any handle can be built up in this way.<sup>[19]</sup>

**Modification of Environment:**

Another major avenue of occupational therapy is adapting the environment to facilitate occupational performance of a particular task. When modifying an environment, often the equipment and tool adaptations are part of that environmental change. In the management of CTS, workstation modification (i.e. adapting the work environment) is a large part of OT intervention. By adjusting the workstation equipment, such as desks, chairs, monitors, and keyboards, the ideal position of the wrist and forearm can be achieved. This can help alleviate symptoms of CTS as well as prevent further damage and strain. Attention should also be given to psychosocial aspects of a work environment, such as job demands and job control, as they may help or hinder return to work and level of functioning within the workplace for those individuals with CTS.<sup>[20]</sup>

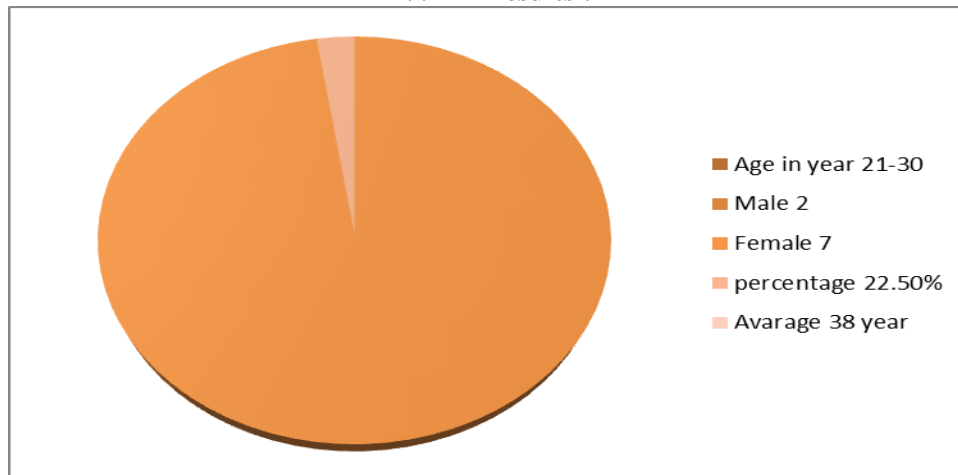
The hand therapists in this study used the following intervention strategies and reported symptom relief:

- Made ergonomic changes to the work station (modify environment)
- Used adaptive scissors and shears (modify tools/equipment)
- Reheated splint material to trim edges (modify task)
- Changed hand position (modify task)
- Used assistive equipment for scar massage (modify tools/equipment)

**Long term recovery:**

Most people who find relief of their carpal tunnel symptoms with conservative or surgical management find minimal residual or "nerve damage". Long-term chronic carpal tunnel syndrome (typically seen in the elderly) can result in permanent "nerve damage". While outcomes are generally good, certain factors can contribute to poorer results that have little to do with nerves, anatomy, or surgery type. One study showed that mental status parameters, alcohol use, yield much poorer overall results of treatment (Katz Jeffrey Net al 2001).<sup>[8]</sup>

**IV. Results :**



**Figure 4:** Age distribution of study subjects (n=40)

The above table shows the age distribution of the study subjects by decades. There were no subjects at or below the age of 20 years. It was found that the highest percentage of study subjects (40%) was in the age group of 31 to 40 years. Average age was 38 years.

**Table 1:** Sex distribution of study subjects (n=40)

Sex	Case	
	Total	Percentage (%)
Male	02	5
Female	38	95

Above table shows the sex distribution of the study subjects. Most of the patients were females with male to female ratio of 1: 19.

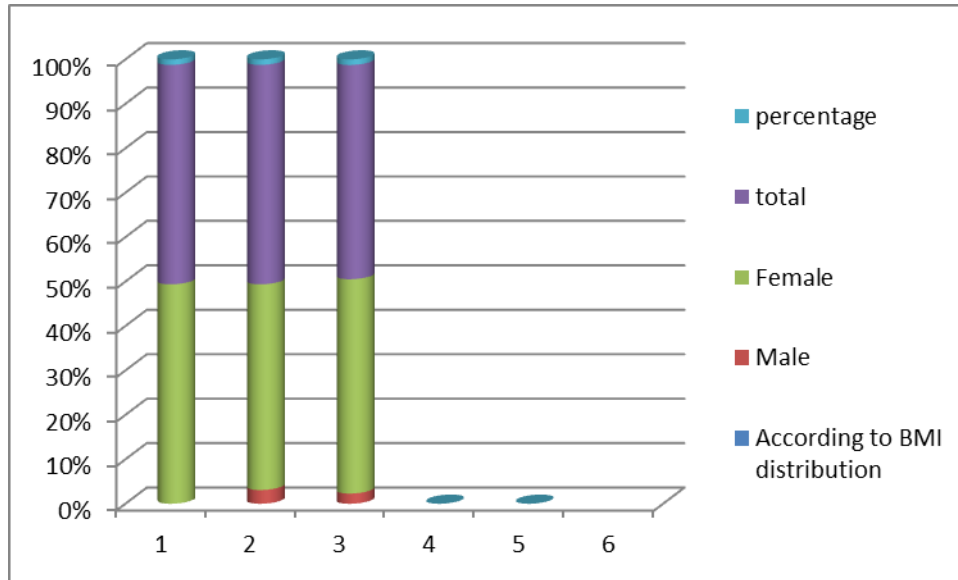


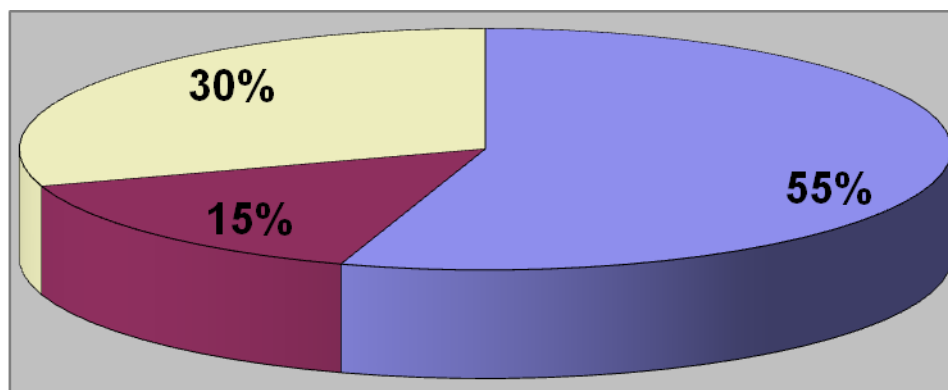
Figure 5: Distribution of body weight in carpal tunnel syndrome(n=40)

The above table shows the cases according to BMI distribution. It was found that the highest percentage of study subjects (55%) were in the overweight group but there were no obese or morbidly obese patient.

Table 2: Distribution of factors associated with carpal tunnel syndrome (n=40)

Associated factor	Male	Female	Total	Percentage (%)
Idiopathic	1	24	25	62.5
Diabetes Mellitus	00	08	08	20
Hypothyroidism	00	02	02	05
Arthropathy	00	02	02	05
Pregnancy	00	01	01	2.5
Occupational	01 weight lifter	01 computer operator	02	05

Above table shows the factors associated with carpal tunnel syndrome. In most of the patients (62.5%) no definite cause could be found which could have caused the CTS.



Legend: Dominant (blue), Non-dominant (maroon), Bilateral (yellow)

Figure 6: Distribution of patients according to dominant, non-dominant and bilateral presentation (n=40)

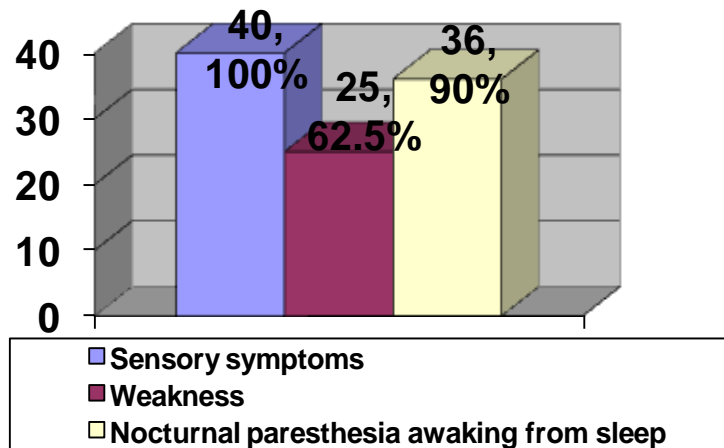


The above diagram shows distribution of hands involved in patients. 55% had dominant, 15% non-dominant and 30% bilateral hand involvement.

**Table 6: Signs of case subjects (n=40)**

Signs	Male	Female	Total	Percentage (%)
Tinnel's sign	2	38	40	100%
Phalen's sign	2	38	40	100%
Durkan's sign	0	24	24	60%
Wasting of thenar muscle	1	31	32	80%

Tinnel's and phalen's sign were present in all the patients and wasting of thenar muscle in 80% of patients.



**Figure 7: Symptoms of case subjects (n=40)**

The above diagram shows the distribution of symptoms of the patients. Sensory symptoms pain, tingling and numbness in the lateral three and half fingers were present in all patients (100%), weakness in hand in 62.5%, nocturnal paresthesia and awaking from sleep in 90% of patients.

### V. Discussion:

The recent year study is an observational and experimental study in which forty patients of Carpal Tunnel Syndrome were included. The age distribution of patients of this study indicates that the age incidence varies from 22 to 50 years. 95% of the patients are between ages 21 to 49, with 40% of the patients between 31 to 40 years of age. In the developed countries it has been stated that incidence peaks in the late 50s (Bland JPK 2007; Pruitt HJN & Swift TR 2000; Mondelli M, Glannini F and Giacchi M 2002; van Kijk MAJ, Reitsma JB, Fischer JC et al 2003), particularly in women, and the late 70s, when the sex ratio is more equal, though some studies have reported a lower age incidence (de Campos CC, Manzano GM, Leopoldino JF et al 2004). In this study the patients are of a more younger age. In this study the patients are of a more younger age. This may be due to the fact that CTS developed in these patients due to excessive physical activities. Nearly in most studies carried out elsewhere, CTS is found to be 3 to 4 times more common in females than in males (Atroschi I, Gummensson C, Johnsson R et al 1999; de Krom MC, Knipschild PG, Kester AD et al 1992). In the only other study done in Bangladesh (Habib M 2006), in 240 cases of CTS, the male:female ratio was found to be 1:4. In our study the ratio is 1:19, which shows a huge predominance of females amongst patients of CTS. Occupations associated with a high incidence of carpal tunnel syndrome include food processing, manufacturing, logging, and construction work. (Bernard 1997; Roquelaure Y, Mechali S, Dano C et al 1997; Silverstein B, Kalat J 1999). The other study of Bangladesh (Habib M 2006) was performed amongst patients of urban area, mostly from the capital city of Dhaka so their ratio of male to female patients was more like that in the developed countries. Several studies have reported relationship of obesity to CTS (Hsieh 2005; De Krom 1990). Nathan and Keniston (1993) evaluated 858 hands in 1984, and re-evaluated 630 hands in 1989. That study found that weight and MBI correlated strongly and positively with maximum latency difference. Univariate and multivariate analyses demonstrated that increased BMI is a significant independent risk factor for CTS in patients under the age of 63 years, but is less important in older patients. Patients over the age of 63 years had a different pattern of risk factors for CTS than younger patients. In economically not so well off societies prevalence of obesity is definitely less than what is found in societies of developed countries, more so in the rural communities.

## VI. Conclusion:

Patients of this study are mostly from the rural communities so obesity is not common. Moreover in this study excessive physical activity is suspected to be the important predisposing factor for development of CTS in these patients so obesity would definitely be uncommon in this group of patients. In recent research of Baie et al (2018) shows that patients diagnosed with primary carpal tunnel syndrome (CTS) who had perform carpal tunnel release CTR from January 2015 to September 2016 has show satisfactory and very promising outcome with low postoperative complications, and good appearance.

## Acknowledgment

Topbright, Dhaka, Bangladesh

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Dr. Khandoker Aatur Rahman "A Study of Forty Patients of Carpal Tunnel Syndrome." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, vol. 17, no. 3, 2018, pp 25-34.