

## Relationship of Age, Body Mass Index and Wrist Circumference to Carpal Tunnel Syndrome Severity

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### Abstract

Carpal tunnel syndrome (CTS) may be a restorative condition because of layering of the average nerve. Likewise it goes through those wrist toward those carpal tunnel. The principle indications are pain, deadness. Also shivering in the thumb, list finger, center finger and the thumb side of the ring fingers. An examination of the association the middle of those CTS seriousness assessed Toward electrophysiological estimations clinched alongside patients with clinical CTS. Also age, gender, BMI, hand wrist circumduction need been meant. An cross sectional consider including 60 patients recruited starting with el Sahel educating help doctor's facility. Also neurology Branch On Banha college healing facilities. Possibly inpatient alternately outpatient facility. We demonstrate a connection between Age, form impostor Index, Wrist perimeter to carpal tunnel syndrome seriousness. There are statistically critical. An connection the middle of Age, form impostor Index, Wrist perimeter will carpal tunnel syndrome seriousness. Anyhow no statistically noteworthy. An connection the middle of sex. What's more side with carpal tunnel syndrome seriousness.

**Keywords:** Age, Body Mass Index, CTS and Wrist.

### 1. Introduction

Side effects normally start bit by bit. Furthermore Throughout those night. Ache might augment up those arm powerless grip quality might occur, Furthermore then afterward a long time of time the muscles In the build of the thumb might waste far [1]. Previously, more than half about cases, both sides need aid influenced.

Danger figures incorporate obesity, tedium wrist work, pregnancy, genetics, What's more rheumatoid joint inflammation. There will be provisional proof that hypothyroidism expands the danger. Diabetes mellitus is weakly connected with CTS. The utilization from claiming conception prevention pills doesn't influence the hazard [3]. sorts about worth of effort that would cohorted incorporate PC work, worth of effort for vibrating instruments. Also fill in that obliges a solid grip [2]. a few parameters for example, such that age, gender, What's more constitution impostor list (BMI) Might be danger figures for CTS. Figure impostor list (BMI) speaks to a paramount danger element to Creating this compressive neuropathy because of expanded constrains in the carpal canafistula [3].

Analysis may be suspected In light of signs, manifestations. Also particular physical tests and might be affirmed for electrodiagnostic tests [1]. whether muscle wasting toward the build of the thumb is present, those analysis is prone [2]. Constantly physically animated might diminish the danger about Creating CTS. Side effects camwood a chance to be enhanced. Eventually Tom's perusing wearing a wrist support or with corticosteroid injections. Taking NSAIDs or gabapentin doesn't show up will a chance to be functional. Surgery with curtailed those transverse carpal ligament is compelling with better outcomes In a quite a while contrasted with non-surgical alternatives. Further splinting then afterward surgery may be not required. Proof doesn't help magnet help. Around

5% about kin in the united states bring carpal tunnel syndrome [4.] It Typically starts Previously, adulthood, Also ladies are more ordinarily influenced over men [2]. Dependent upon 33% of individuals might enhance without particular medicine through pretty nearly a quite a while [5] carpal tunnel syndrome might have been principal completely depicted following reality War ii [6]. In this study, a examination of the association between the CTS seriousness assessed. Eventually Tom's perusing electrophysiological estimations to patients with clinical CTS. Also age, gender, BMI, hand wrist perimeter bring been meant.

### 2. Patients and methods

#### 2.1 Subject selection

A cross sectional study including 60 patients recruited from El Sahel teaching hospital and Neurology Department in Banha University Hospitals either inpatient or outpatient clinic.

#### 2.2 sample size

Sample size is 60 case will be calculated using the following equation:

$$N = (z^2 * p * q) / (e^2)$$

$$Z \text{ square, } E \text{ square, } PQ = p(1-p)$$

#### 2.3 Inclusion criteria

Both sexes were included, Age (18\_70)years old was included and patients with complaints involving one or both extremities were diagnosed as CTS and assessed electrophysiologically.

#### 2.4 Exclusion criteria

1.Trauma, excluded by detailed medical history and examination, 2.DM . Excluded Toward fasting. Furthermore postprandial glucose serum level and glycated hemoglobin, 3. Hypothyroidism, excluded. Eventually Tom's perusing point by point restorative history and examination. What's more thyroid capacity tests, 4. Pregnancy excluded.

Eventually Tom's perusing basic pregnancy test will ladies Previously, childbearing period and 5. Rhumatoid joint inflammation excluded Eventually Tom's perusing point by point restorative history Also examination, lab investigations include: ESR,CRP and rheumatoid variable. Ponder methods: Patients in this ponder were submitted of the following: 1. Point by point restorative history including particular history, crew history, danger figures and historical backdrop for introduce illness, 2. Careful general and neurological examination, 3. Nerve conduction consider of average nerve (motor\_ sensory\_ f. Wave), 4. Thyroid work tests, 5. Fasting (70\_100 mg/dl) Furthermore postprandial glucose serum level(120\_140 mg/dl) Furthermore glyated hemoglobin<6%, 6. ESR(0\_20mm/h),CRP <6 mg/l, 7. Estimation about wrist perimeter to cm What's more 8. Evaluation for figure impostor list.

## 2.6 Statistical Methods

Recorded data were analyzed using the statistical package for social sciences, version 20.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were expressed as mean± standard deviation (SD). Qualitative data were expressed as frequency and percentage.

## 3. Results and discussion

### 3.1 Results

The ranged 23-59 with mean  $43.90 \pm 9.10$  of age (years), while female (71.7%) and male (28.3%) of sex Fig (1).

The class 1 obesity 22 (36.7%), class 2 obesity 14 (23.3%), class 3 obesity 10 (16.7%) and Overweight 14 (23.3%) of classification of BMI. Fig (2).

The left 21 (35%) and right 39 (65%) of side Fig (3).

The Mild 30 (50.0%), Moderate 10 (16.7%) and Severe 20 (33.3%) of CTS severity Fig (4).

The ranged 15.8-20.4 with mean  $18.03 \pm 0.99$  of wrist circumference (cm) Table (1)

The mean of motor latency (ms)  $5.55 \pm 1.61$ ; sensory latency (ms)  $3.68 \pm 0.70$  and F-wave (ms)  $27.45 \pm 2.04$  Table (2)

This table shows statistically significant relation between CTS severity with age (years), while sex insignificant Table (3)

This table shows statistically significant relation between CTS severity with weight, BMI and classification of BMI Table (4)

This table shows no statistically significant relation between CTS severity with side Table (5)

This table shows statistically significant relation between CTS severity with wrist circumference Table (6)

This table shows statistically significant relation between CTS severity with motor latency, sensory latency and F-wave Table (7).

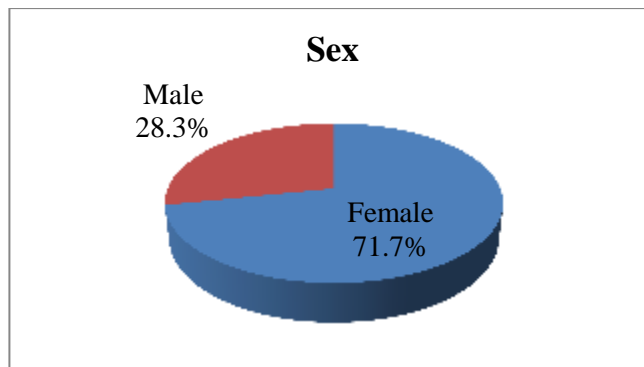


Fig (1) Pie chart sex distribution of the patients group

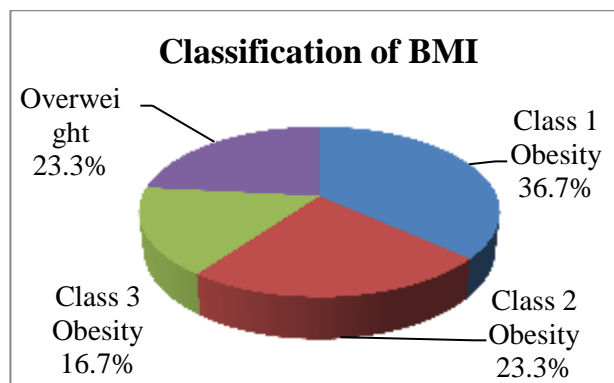


Fig (2) Pie chart classification of BMI distribution of the patients group.

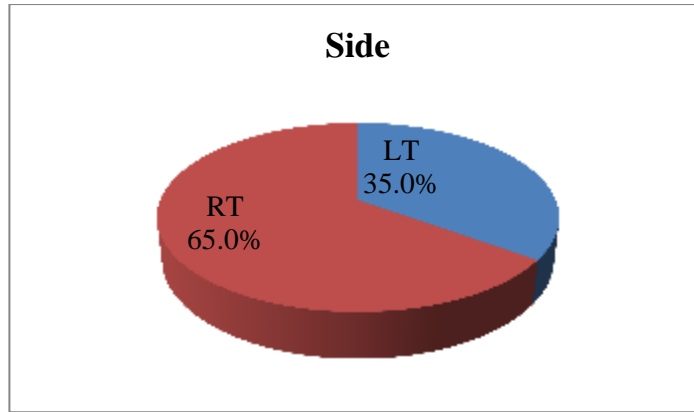


Fig (3) Pie chart side distribution of the patients group.

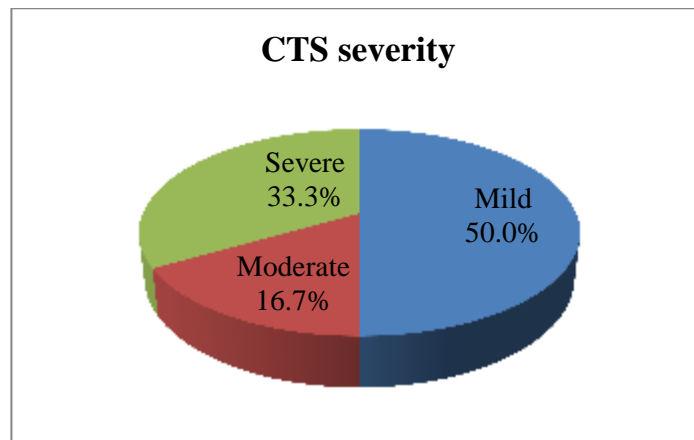


Fig (4) Pie chart CTS severity distribution of the patients group.

Table (1) Wrist circumference (cm) descriptive of the patients group.

Wrist Circumference (cm)	Total (n=60)
Range	15.8-20.4
Mean±SD	18.03±0.99

Table (2) Motor latency, sensory latency and F-wave descriptive of the patients group.

	Total (n=60)
Motor Latency (ms)	3.9-9.8 [5.55±1.61]
Sensory Latency (ms)	2.1-5.2 [3.68±0.70]
F-wave (ms)	23-31 [27.45±2.04]

Table (3) Relation between CTS severity and demographic data of the patients group.

Demographic data	CTS severity			F/x <sup>2</sup> #	p-value
	Mild (n=30)	Moderate (n=10)	Severe (n=20)		
Sex					
Female	25 (83.3%)	6 (60.0%)	12 (60.0%)	4.022#	0.134
Male	5 (16.7%)	4 (40.0%)	8 (40.0%)		
Age (years)					
18-35 years	10 (33.3%)	0 (0.0%)	0 (0.0%)	---	---
36-50 years	20 (66.7%)	6 (60.0%)	10 (50.0%)	6.815	0.033*
>50 years	0 (0.0%)	4 (40.0%)	10 (50.0%)	14.610	<0.001**

Table (4) Relation between CTS severity and anthropometric measurements of the patients group.

Anthropometric measurements	CTS severity			F/x <sup>2</sup> #	p-value
	Mild (n=30)	Moderate (n=10)	Severe (n=20)		
<b>Height (cm)</b>					
Mean±SD	159.60±7.56	164.00±1.15	161.60±6.54	1.791	0.176
Range	145-172	162-165	150-168		
<b>Weight (kg)</b>					
Mean±SD	81.70±14.84	97.80±6.97a	93.90±15.28a	7.177	0.002*
Range	67-117	91-107	70-127		
<b>BMI [wt/(ht)<sup>2</sup>]</b>					
Mean±SD	31.90±4.94	36.08±2.15a	35.98±6.66a	4.547	0.015*
Range	25-41	33.8-39	26.6-46.6		
<b>Classification of BMI</b>					
Overweight	10 (33.3%)	0 (0.0%)	4 (20.0%)		
Class 1 Obesity	12 (40.0%)	4 (40.0%)	6 (30.0%)	15.221#	0.019*
Class 2 Obesity	4 (13.3%)	6 (60.0%)	4 (20.0%)		
Class 3 Obesity	4 (13.3%)	0 (0.0%)	6 (30.0%)		

Table (5) Relation between CTS severity and side of the patients group.

Side	CTS severity			x <sup>2</sup>	p-value
	Mild (n=30)	Moderate (n=10)	Severe (n=20)		
LT	9 (30.0%)	4 (40.0%)	8 (40.0%)		
RT	21 (70.0%)	6 (60.0%)	12 (60.0%)	0.659	0.719

Using: x<sup>2</sup>: Chi-square test; p-value >0.05 NS

Table (6) Relation between CTS severity and wrist circumference of the patients group.

Wrist Circumference (cm)	CTS severity			F	p-value
	Mild (n=30)	Moderate (n=10)	Severe (n=20)		
Mean±SD	17.57±1.03	18.48±1.18a	18.49±0.33a	7.909	0.007*
Range	15.8-19.5	16.9-20.4	18-19		

Table (7) Relation between CTS severity and motor latency, sensory latency and F-wave of the patients group.

	CTS severity			F	p-value
	Mild (n=30)	Moderate (n=10)	Severe (n=20)		
<b>Motor Latency (ms)</b>					
Mean±SD	4.32±0.30	5.30±0.15a	7.51±1.21ab	114.943	<0.001**
Range	3.9-4.9	5.1-5.5	6.1-9.8		
<b>Sensory Latency (ms)</b>					
Mean±SD	3.43±0.40	3.40±0.54	4.19±0.86ab	10.449	<0.001**
Range	2.2-4	2.4-3.8	2.1-5.2		
<b>F-wave (ms)</b>					
Mean±SD	26.40±1.84	28.08±0.12a	28.70±2.05a	10.968	<0.001**
Range	23-30	28-28.3	25-31		

### 3.2 Discussion

Carpal tunnel syndrome (CTS) will be the the vast majority every now and again seen neuropathy of the upper extremities and it influences roughly

1–2. 7% of the general number. CTS will be the clinical outcome manifeste by the side effects in the average nerve conveyance region (thumb, pointing finger, working finger) created Toward the

layering of average nerve underneath those flexor retinaculum at the hand wrist vicinity [7]. CTS finding is attained for clinical discoveries Furthermore electrophysiological examinations. Preservationist medicines might a chance to be supportive clinched alongside some CTS patients, Yet Eventually surgical mediation may be required for The majority patients [8]. CTS need multifactorial etiology. Systemic, anatomical, idiopathic, Furthermore ergonomic Components Might make noteworthy done etiology. A few parameters for example, such that age, gender, and form impostor list (BMI) Might make danger figures to CTS [9]. This examine meant to figure out the relationship the middle of those CTS seriousness assessed Eventually Tom's perusing electrophysiological estimations to patients for clinical CTS Furthermore age, gender, BMI, hand wrist perimeter. This might have been crosswise over sectional healing facility built contemplate led for 60 patients with CTS diagnosed clinically Also were evaluated electrophysiologically. Patients were recruited from neurology Branch over Benha school Furthermore el Sahel educating doctor's facilities.

In this consider dominant part of the liable assembly were females 71. 7% However no noteworthy distinction might have been identifier At those association for CTS seriousness and sexual orientation might have been investigated.

Comparable discoveries were accounted Toward large portions past investigations and established no huge association between sex and seriousness of CTS [7] & [10]. Over A percentage investigations it need been accounted that those female sex is a autonomous hazard calculate in all ages and it might have been more stupendous "around nonobese ladies Also diabetic patients. [11]. Our contemplate exhibited that there may be a statistically noteworthy relationship between agdistis Also CTS seriousness. This finding will be perfect for some other examination [12] & [13]. The point when we sorted our patients as stated by their ages Concerning illustration 35 What's more younger, 36–50, 50 Also older, Also assessed them, those CTS seriousness of 36–64 agdistis aggregations might have been seen to have expanded in examination of the age class from claiming 35 Furthermore more youthful. Also the CTS improvement hazard of the agdistis 65 What's more more seasoned gathering need expanded for in examination of the 35 What's more more youthful aggregation. It need been accounted for that the accomplishment for CTS medication will be considerably more level over more seasoned patients, What's more On particular, maturity may be An negative prognostic calculate in CTS decompression [14]. Accoring will brings about this letter, we decipher that Likewise there would proclamations with admiration to possibility CTS hazard build for those reduction for axon,

advancement for nerve conduction, Also vascular abnormalities because of maturing [7]. In this investigation Our discoveries backing those comes about for exploration reporting weight that CTS improvement hazard may be identified with BMI Also weight expand [15], [7] & [16] On our consider it need been watched that Likewise the BMI builds so can the CTS seriousness.

An causal cooperation between BMI and CTS will be underpinned via a few epidemiologic investigations. ( Shiri r 2015) as stated by An later meta-analysis, those hazard for CTS or carpal tunnel arrival ascents relentlessly with BMI (subjects who need aid hefty display An 2-fold increment for risk), Furthermore this affiliation didn't vary between men and ladies [17]. Despite the pathogenic pathway between BMI and CTS may be vague. Our brings about this ponder Might make demonstrated Toward that those amassing from claiming fat tissue in the carpal canafistula Presumably expanded the hydrostatic weight because of those translocation of blood volume starting with the legs of the arms in the supine position, Also synovial thickening On large individuals through those waterway compresses the average nerve. Fast determination of side effects then afterward surgical decompression proposes the inclusion of ischemic segments auxiliary will Ceaseless nerve packing [11]. Done other consider it need been accounted that higher quality BMI builds the CTS improvement danger Yet would inconsequential of the seriousness of the CTS [13] in this study there might have been a noteworthy Factual relationship between CTS seriousness for wrist perimeter. Past investigations underpinned that Concerning illustration it might have been found that there will be An huge association between the CTS seriousness Furthermore hand-wrist perimeter [11]. Our comes about Might be demonstrated as stated by [15] who stated that Concerning illustration those wrist breadth build weight inside those tunnel expansion bringing about layering from claiming structures inside the tunnel.

On contrast, the contemplate of [18] discovered no different relationship the middle of the seriousness of CTS and hand wrist circumduction.

This finding Might be explained as stated by [7] who found that there may be a huge relationship the middle of those CTS seriousness Also hand-wrist circumduction. But, The point when the measurable assessment might have been rehashed then afterward the revision from claiming BMI impact looking into hand-wrist circumference, no noteworthy relationship might have been watched the middle of the hand-wrist circumduction What's more CTS seriousness. This discovering recommends that weight expansion need an impact once CTS seriousness yet the build during the hand-wrist circumduction need no regulate impact around CTS seriousness.

#### 4. Conclusion

There are statistically significant a relation between Age, Body Mass Index, Wrist Circumference to Carpal Tunnel Syndrome Severity. but no statistically significant a relation between sex and side to Carpal Tunnel Syndrome Severity.

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