Research Square

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Comparison between Carpal Tunnel Syndrome and Individuals with Symptoms of Obsessive-Compulsive Disorder

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Abstract

Objective: Carpal tunnel syndrome (CTS) is the most common peripheral nerve entrapment neuropathy and is seen in 3 % of the general population. The aim to this study was examine the relationship between the symptoms of cleaning compulsion with using Moudsley obsessive compulsive inventory (MOCI) and patients with CTS.

Methods: Sixty patients with CTS and 60 healty controls were evaluated in Bezmialem Vakif University Faculty of Medicine Neurosurgery Clinic. Neurological examination, Electrophysiological findings, the presence of neuropathic pain evaluated by the Leeds assessment of neuropathic symptoms and signs (LANSS) , the symptoms of obsessive- compulsive disorder using with MOCI and anxiety levels assessed by the Beck Anxiety Inventory (BAI) were evaluated.

Results: No statistically significant relationship was observed between anxiety levels and CTS (p › 0.005). No statistically significant relationship was found MOCI rumination, control and doubting subscale scores (p › 0.005). Patient group had higher MOCI cleaning subscale scores than the control group and the difference was statistically significant (p=0.008). Patient group had higher MOCI slowness subscale scores than the control group and the difference was statistically significant (p=0.004).

Conclusion: Increased wrist movement in people that have the symptoms of compulsive cleaning is associated with the risk of CTS. Our study show that a reduction of high level of wrist flexion-extansion movements may decrease the new CTS cases.

Introduction

Carpal tunnel syndrome (CTS) is the most common peripheral nerve entrapment and is seen in 3% of the general population (1). The carpal tunnel (CT) is formed by the wrist bones, the transvers ligament (TL), flexor retinaculum, and the median nerve (MN) passes into the CT (2). Due to its specific location in CT, MN is highly susceptible to compression, and in repeated wrist flexion/extansion movement, the pressure in CT increases and compresses MN and symptoms begin (2). Typical syptoms include numbness, paraesthesia and pain in the areas innervated by MN, weakness and atrophy of the thenar muscles which affects the quality of life and work efficiency in affected patient (1, 6). Electromyography (EMG) is 49–84% sensitive and 95–99% specific for diagnosis (3). The Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) scale is a clinical-based test used to identify patients whose pain is dominated by neurophatic mechanisms (4).

People who have the symptoms of Obsessive compulsive disorder (OCD) feels need to perform certain routines repetedly called compulsion and thoughts repetedly called obsessions and they don’t control either the activities and thoughts in a short period of time (5). Especially in individuals with symptoms of cleaning activities ,due to excessive flexion/extension movements MN could be trapped in CT, so between these persons and CTS was evaluated. Psychiatric disorders can also be observed in people have the symptoms of OCD, anxiety levels were also evaluated in our study (6).

Methods

Our study was carried out Bezmialem Vakif University Faculty of Medicine Neurosurgery Clinic, consist of 60 CTS patients and 60 control groups, between January 2017 and March 2019. Patients with older than 18 and younger than 65 years old were included in this study. The exclusion criteria were older than 65 years old, cervical disk herniation ans cervical canal stenosis. EMG findings of upper extremity has two groups minimal-mild and moderate-severe CTS.

Neurophatic pain was assessed with LANSS that consist of two parts pain questionnaire and sensation. Pain questionnaire consist of 5 questions and is worth 16 points. And a total aof 8 points including 5 points allodini and 3 points pin-prick thereshold sections. I this way, the LANSS test is totally 24 points. Twelve and below not have neurophatic pain b1tween 13 and 24 have neuropathic pain (8).

Beck anxiety inventory (BAI) is required to measure standards anxiety levels. The BAI consist of 21 questions each has between 0–3. Between 0–9 shows minimal, 8–15 mild, 16–25 medium and 26–63 serius anxiety (10).

Moudsley obsessive compulsive inventory (MOCI) is a self report scale performed by Hodgson and Rachman and used to measure the type and severity of OCD symptoms (10, 22). The MOCI scale is consist of 30 items and 4 sub-scales that are called checking, cleaning, slowness and doubting. Adaptation of the scale into Turkish, validity and reliability of the Turkish form were done by Erol and Savasir (9). Turkish form of MOCI contains 37 items (7 items from Minnesota Multiple Personality Inventory [MMPI]) and 5 sub-scales (5th sub-scale is called rumination). The measurement is made according to the “right” or “wrong” responses given by the participants. As the MOCI scale scores increase, it is assumed that the severity of OCD symptoms increases (7).

Statistical Analysis

Statistical analysis of the data of our study which was planned as a cross-sectional study, was performed using SPSS 24.0 package program. All numerical variables were expressed as mean ± standard deviation, and categorical variables were represented by frequency and probability tables. Kolmogorov Smirnov and Shapiro-Wilk tests were performed to test the compatibility of the sample with normal distribution in terms of age and educational level. It was shown that it had normal distribution. Due to the compatibility with the normal distribution, independent samples t-test (Student t-test) was used for comparison of numerical data and the chi-square test was used for comparison of categorical variables. Pearson correlation test was applied to investigate the correlation between numerical data. A p value < 0.05 was accepted as statistically significant in all statistical analyses.

Results

A total of 60 CTS patients, 54 (90%) women and 6 (10%) men were included in our study. The mean age of patients was 46, (26 ± 8.76 years). Eight patients have hypertension, 6 have diabetes mellitus, 2 have

hypothyroidism, 1 has OCD, 1 has pregnant and 1 has cow milking work for a long years. There was no comorbidity in 41 of the patients. According to the EMG findings, patients were analyzed in 2 groups minimal-mild and moderate-severe CTS. Twenty-eight of the patients were minimal to mild and 32 were moderate to severe CTS. Neuropathic pain was present in 33 (55%) of the patients. Four of the patients had surgery. According to the BAI, 15 (25%) patients have minimal, 17 (28%) mild, 16 (27%) moderate and 12 (20%) severe anxiety syptomps. No significant relationship was observed between anxiety levels and CTS (p ›0,005). No significant relationship was observed between MOCI (checking sub-scale) and CTS (p ›0,005). No significant relationship was observed between MOCI (doubting sub-scale) and CTS (p ›0,005). A significant relationship was observed between MOCI (cleaning sub-scale) and CTS (p = 0,008). A significant relationship was observed between MOCI (slowness sub-scale) and CTS (p = 0,004).

Table 1

	group	n	mean	Standard deviation	F	t	p
Age	CTS	60	46.3	8.8	18.5	1.8	0.068
	control	60	42.6	13.0		1.8	0.069
Anxiety	CTS	59	1.3	1.1	1.3	-.2	0.871
	control	60	1.4	1.8		-.2	0.870
MOCI(control sub-scale)	CTS	50	2.9	2.0	0.3	.1	0.922
	control	58	2.9	2.2		.1	0.922
MOCI(cleaning sub-scale)	CTS	50	4.8	3.0	25.8	2.7	0.008
	control	58	3.6	1.5		2.6	0.011
MOCI(slowness sub-scale)	CTS	50	2.5	1.5	3.9	3.0	0.004
	control	58	1.7	1.2		2.9	0.004
MOCI(doubting sub-scale)	CTS	50	3.2	1.7	2.7	.2	0.874
	control	58	3.2	1.3		.2	0.877
MOCI(rumination sub-scale)	CTS	50	2.2	5.2	1.4	-.5	0.599
	control	58	3.7	20.1		-.6	0.576

Discussion

Most patients of CTS are manifested by pain and numbness. Understanding the mechanism of pain is necessary to create an appropriate treatment plan. The LANSS pain scale is a validated tool for distinguishing patient with neuropathic pain from with nociceptif pain. Gursoy et al. showed that neuropathic pain mechanisms in CTS does not have a significant relationship with CTS severity in EMG (8). In another study, Truini et al. reported that there was no difference between the the presence of neuropathic pain and CTS severity in 70 CTS patients (14). In our study 28 patients had minimal to mild and 32 patients had moderate to severe CTS. We found neuropathic pain in 33 (55%) of our patients.

Lund et al.measured wrist angular velocity, mean power frequency and range of motion on 33 different professions. They reported that statistically significant relationship between wrist movements level with risk of CTS (7). In another study, Violente et al found an increased incidence of CTS for workers exposure to fast and forceful manual work (11). Mattioli et al. reported that prolonged flexion-extension movement of the wrist, and especially the use of vibrating hand tools, increase the risk of CTS (12). In our study, we found that statistically significant relationship between individuals with symptoms of cleaning compulsion and the risk of CTS ($p = 0.008$).

CTS usually occurs with repetitive movements of wrist and resulting in synovial sheath hypertrophy, tenosynovitis, intracarpal swelling and MN compression (1, 15, 16). Rheumatoid arthritis, scleroderma, systemic lupus erythematosus, polymyalgia rheumatica, collagen tissue diseases, diabetes mellitus, pregnancy, estrogen and oral contraceptive use, acromegaly, myxedema, hyperparathyroidism, amyloidosis, tumors such as lipoma and ganglioma, chronic trauma are diseases and conditions associated with CTS. However usually the cause of CTS is unknown called idiopathic CTS (17).

The treatment is carried out according to the cause of the CTS. For example, it is thought that during pregnancy CTS is caused by fluid retention, and postpartum resolves spontaneously (18). Conservatively, a splint is recommended to holding the wrist at 15 degress of dorsiflexion to reduce the night awakening of the patients. In addition, non-steroidal anti-inflammatory drugs, physical therapy methods such as ultrasound and electrical nerve stimulation, can also be used. If the CTS symptoms do not improve with treatment of systemic disease, if conservative treatment methods are not effective and the symptom are progressing, if there is neurological motor loss, EMG nerve conduction abnormalities, surgical decompression should be considered. In surgery, it is aimed to remove the median nerve compression by cutting the transverse ligament completely. Surgical intervention may fail due to insufficient incision of the transverse ligament, cutting of the MN palmar motor branch, and the development of abnormal granulation. In this case, symptoms may continue in the same way, recur after a certain improvement, and new symptoms may develop (19).

As surgical treatment methods, open surgery, microsurgery or endoscopic surgery methods can be used. In generally local anesthesia is used in open surgery. In open surgery, which is a minimally invasive technique, standard incision and mini incision can be applied. The longitudinal long incision is used in tha standard incision, the advantage is that all carpal tunnel elements are visible, and the disadvantage is

that the scar tissue is large and can lead to loss of hand function. Mini incision is preferres due to minimal scar tissue but since all of the carpal tunnel elements cannot be seen, it is necessary to check whether the transverse ligament is completely cut. The advantage of standart open surgery over all other surgical methods is to dissect and protect the MN motor branch. There are those who claim that microsurgery is the most important advantage of fully viewing and incising the distal part of the transvers ligament, as well as those who claim the same advantage in open surgery.

In a study comparing endoscopic surgery with open surgery, it was reported that infection, hypertrophic scar tissue and scar sensitivity are more common in open surgery, and when total number of complications is evaluated, endoscopic surgery is more reliable. Also, in endoscopic surgery, the muscle and skin on the transverse carpal ligament are preserved, providing better grip strength and earlier return to work. However, the most important disadvantages of endoscopic surgery are injury to MN and superficial palmar arcus. As a result, regardless of the surgical method, recovery rates in CTS are reported to above 90% (20, 21).

Conclusion

Our study is associated with an increased risk of CTS due to recurring wrist movements in individuals with symptom of cleaning compulsion. The management of reducing the repetitive movement in the wrist of the individuals with symptom of cleaning compulsion shows that the development of new CTS cases can be prevented. Our study is retrospective, single-center and limited, since it contains few cases. However, large-scale studies are needed.

Abbreviations

BAI Beck anxiety inventory

CT Carpal tunnel

CTS Carpal tunnel syndrome

EMG Electromyography

LANSS Leeds Assessment of Neuropathic Symptoms and Signs

MMPI Minnesota Multiple Personality Inventory

MN Median nerve

MOCI Moudsley obsessive compulsive inventory

OCD Obsessive compulsive disorder

TL Transvers ligament

Declarations

Ethics approval and constend to participate :

This study was approved by Bezmialem Vakif University non-interventional research Ethics Committee (18.07.2018, 14/14).

Constent for publication:

None

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None

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Authors’ contributions :

MGP and AA were main contributors for designing and preparing this article. MHS, EC and ATP collected data . YS reviewed for this article. All authors read and approved the final manuscript.

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