

Carpal Tunnel Syndrome and Its Prevalence in Pregnant Females of Faisalabad Pakistan

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Abstract: Carpal Tunnel Syndrome is symptomatic compression neuropathy of the median nerve at the level of the wrist. This syndrome is the second highly frequent musculoskeletal disorder, followed by a back pain. To find out the prevalence of pregnancy-related carpal tunnel syndrome, data was collected from the DHQ and Allied hospitals of Faisalabad with the help of Boston carpal Tunnel questionnaire modified according to studies. Total 300 patients were assessed by taking the history of sign and symptoms and provocative physical tests. Among them 103 patients showed all the symptoms and tests positive, these diagnosed patients were then asked to fill out a questionnaire to check the severity of their symptoms and functional limitations. Data was collected and analyzed by SPSS-23. Results have shown that the prevalence of PRCTS is 34.3%. Multigravida women 72.8 % shows more occurrence than that of primigravid which is 27.2 %. On the numeric pain rating scale, most patients reported severe pain. On the BCTQ, the most patient reported severe pain, weakness, numbness/tingling at night, medium pain at daytime; Numbness and tingling were the most prominent symptoms in most of the patients. A relationship was found between education and symptoms and between education and treatment taken, both showed significant relationship $\chi^2= 28.540a$ and $p\text{-value}=.000$ ($P<0.05$). Another relationship was found between socioeconomic status and symptoms and between socioeconomic status and treatment taken, both show significant relationship $\chi^2= 11.776a$ and $p\text{-value}=.001$ ($P<0.05$).

Keywords: Carpal tunnel syndrome, Functional limitation, Multigravida, Primigravid, Median nerve

INTRODUCTION

American Academy of orthopedic surgeons defines Carpal Tunnel Syndrome (CTS) as the entrapment of the median nerve at the level of wrist causing symptomatic neuropathy. The incidence rate in the general population is about 3.8% and seems to be extra common in a female with up to 9.2% prevalence rate than in male with 6%. Bilateral occurrence is common in 40-60 years of age (1) and up to 73 % of cases (2). In 1854, Sir James Paget, presented the first case of median nerve compression at the level of wrist, which occurred after a fracture of the distal radius (3). CTS can be acute and chronic, Acute CTS is uncommon and requires more aggressive

and instant management (4). CTS is the most expensive musculoskeletal disorder of upper-extremity in the US with the annual estimated cost of medical care beyond \$2 billion, mainly due to surgical releases (5).

The carpal tunnel is bounded by the carpal bones on its three borders and by the flexor retinaculum on the fourth side, thus the carpal tunnel volume remains fixed at around 5 ml, with a very small space for swelling or expansion secondary to its inflexible borders (4). The carpal tunnel is nearly as wide as a width of a thumb (6). Total 10 structures the median nerve and nine tendons pass through the tunnel. These tendons comprise of the four flexor digitorum superficialis tendons, four flexor

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digitorum profundus tendons, and the tendons of the flexor pollicis longus. The hamate, triquetrum, scaphoid, and capitate forms the dorsal floor of the carpal tunnel. Scaphoid tubercle and the trapezium makes radial border while the ulnar border is composed of the pisiform, the hook of the hamate and triquetrum. Three structures that frame flexor retinaculum forms volar surface, which includes the transverse carpal ligament, the deep forearm fascia, and the distal aponeurosis dividing hypothenar and thenar musculature. Carpal tunnel proximally begins at the volar wrist crease and extends distally to a line running from the abducted border of thumb to the hook of the hamate i.e. Kaplan cardinal line, with tunnel's average width is 25 mm. The tunnel's narrowest part is about 20 mm long which is present at the level of the hook of the hamate. There is an opening at a proximal and distal part of the tunnel, and synovium at either end give it the features of closed compartment. The rise in compartment pressure above the threshold level causes a decrease in blood flow consequently compromised median nerve and paresthesia in the distribution of the nerve (4).

Patients most of the time come with a complaint of numbness in the distribution area of the median nerve of the hand, wrist pain, nighttime awakenings due to pain, wrist torment, the decay of the thenar muscles, and weakness of the muscles in later stages of life. Most pregnant patients come with a history of pain in both wrists and generally in their third trimester of pregnancy, however, it can also appear in initial days of pregnancy and with one-sided side symptoms. Carpal Tunnel Syndrome most commonly appears with the symptoms of pain and numbness in the palmar side of the thumb, radial half of the ring finger, long finger, index finger, likewise throbbing pain in the thenar prominence, weakness in the thumb opposition, and weakness and atrophy of thenar muscles (7). Usually both hands are affected but one hand typically presents with more severe symptoms (8).

Other common manifestations observed were burning pain of wrist with the weakness of grip strength and dexterity; symptoms get more

severe at night time and can aggravate while performing powerful activities and extreme positions of the wrist. CTS can be diagnosed to a high degree of specificity through history and physical examination (9). CTS may progress with changing symptoms through different severity level: in mild CTS, is described as swelling, nighttime paresthesia, and pain released by varying the position of the hand and shaking hands. In moderate CTS, symptoms persist during the day and a decrease in sensation of hands leads to clumsiness of the finger and falling objects. In severe CTS, there is atrophy of the thenar eminence and numbness without pain in wrists (10).

Pregnancy comprises 37 to 42 weeks due to musculoskeletal changes, hormonal variations, and extravascular and intravascular fluid shifts. The real basis of pregnancy-linked Carpal Tunnel Syndrome is still unknown; may be multiple factors, with compression of the median nerve developing from usual physiological changes which occur during pregnancy. Expanded Maternal blood volume comes about because of the increase in both erythrocyte count and plasma volume. Raised heart rate, increased metabolism, and raised stroke volume are combined with a decline in peripheral vascular obstruction, so mean systemic blood pressure is often unaltered. Hormonal alterations, for example, raised levels of angiotensin and rennin, progesterone leads to retaining of fluid in the body, increase in weight, combined with the development of the growing embryo, highly burden the musculoskeletal system; and fluid retention leads to the development of wide spread edema during pregnancy. Edema and swelling in carpal tunnel can develop pressure on the median nerve. Pregnant female who develop pregnancy-induced hypertension or develop preeclampsia during pregnancy carries a risk of CTS development. There is a solid relationship of summed up edema and CTS improvement, however, there is less proof for an immediate connection between weight pick up amid pregnancy and CTS. Patients nursing their babies after conveyance have expanded

CTS improvement that diminished with the end of nursing. There is a known relationship between the development of generalized edema and Carpel Tunnel Syndrome during pregnancy but there is less known about the direct link between weight gain and development of Carpel Tunnel Syndrome. There is a recognized relation between altered Glucose metabolism and development of Carpel Tunnel Syndrome. Pregnant females suffer from glucose metabolism variations; leading to an increase in fasting insulin levels, decrease in insulin sensitivity, hepatic glucose production to compensate increased metabolic demands of fetus and mother during pregnancy. Endocrine adaptations of pregnancy as in diabetic patients can add to the development of CTS. However, diabetes is not a risk factor for PRCTS development. Finally, pregnancy may predispose to hypersensitivity of nerves in females (7).

Evaluating PRCTS is not dissimilar than assessing any new patient coming with hand paresthesia. A complete physical examination and medical history are required. The history of the patient should explain the quality, length, and regularity of symptoms. Precisely, to comprehend the area of distribution of the numbness and if the clinical features are intermittent or constant; also question about the age of gestation, nulli-parity, previous PRCTS, massive edema, weight gain, and any recent complications of pregnancy, such as development of gestational high blood pressure or pre-eclampsia. Difficulties in performing tasks such as writing, combing hair buttoning shirts are common complaints. Increase in symptoms by sleep or repetitive hand movements. Females having pregnancy, in their first 2 trimesters usually suffer from acute, rapidly developing symptoms for which conservative treatment most often does not work. Electrodiagnostic evaluation can confirm the diagnosis of acute median nerve compression with sensory and motor conduction blocks at the wrist. CTS occurring during the third trimester of pregnancy, most often present with a gradual onset of symptoms that responds very effectively to conservative management and usually recovery post-delivery. Physical examination, include complete evaluation

of thenar atrophy, muscle strength, 2-point discrimination, and sensory deficits. Provocative examination beneficial in the accurate diagnosis of CTS include Tinel's test, Durkin's compression test Phalen's test and reverse Phalen's. The occurrence of tingling in the distribution area of the median nerve and numbness indicates a positive test. These tests are beneficial in the clinical diagnosis but none of these tests carry 100% sensitivity; the sensitivity for Phalen's test ranges from 49% to 89% and Tinel's test ranges from 45% to 75%. (7). BCTQ is a most frequently recommended in Italy for outcome measure in Carpel Tunnel Syndrome as it is highly reproducible, patient-oriented, and authenticated in the Italian language. For the evaluation of clinical feature (BCTQ SYMP, 11-parameter scale is used, and for the evaluation of functional level BCTQ FUNCT, 8-parameter scale is used, having 5-point scale; higher scores indicate slow functional level and more-severe symptoms. The pain visual analog scale is used for the evaluation of pain (11). Evaluation of pain symptoms in a little finger will differentiate median and ulnar nerve compression; similarly, Spurling's test can identify a cervical spine cause.

The Tinel test includes the analysis of median of the median nerve by percussing the site of the median nerve at the wrist; the development of numbness in the area of distribution of the nerve indicates a positive test. Phalen's test is carried out by flexing the wrist at 90 for 60-s. The median nerve is compressed between the transverse carpal tendon and flexor ligaments. If the patient reports numbness in the area of median nerve distribution, the test is regarded as positive. Durkan described the carpal tunnel compression test, requiring the analyst to apply direct pressure to the carpal tunnel for 30-s, development of numbness in the area of the distribution of nerve declares a positive test confirmatory testing with NCS and EMG are recommended when clinical diagnosis is ambiguous; when fewer clinical features are present; and when other neurologic diagnoses, instead of CTS, are supposed. Electro-diagnostic assessment can be carried out in patients who do not respond

to conservative treatment, in the presence of persistent numbness, when surgical treatment is considered thenar atrophy is present. MRI or ultrasonography is helpful for direct picturing of the median nerve and other soft tissue of that area but MRI for diagnosing CTS is comparatively less specific, there is also significance of high-frequency ultrasound examination of the median nerve in the identification of CTS, it can recognize disorders like flattening distal carpal tunnel nerve, increase in palmar flexion of the transverse ligament swelling of the median nerve (10). The BCTQ is considered a valuable assessment tool for identifying the intensity of the clinical features and functional capability in Carpel Tunnel Syndrome. The questionnaire is self-administered which is supportive in the screening of patients for Carpel Tunnel Syndrome and for assessing the result of interventions of treatment (12).

American Academy of Orthopedic Surgeons reports that there is no specific data to deliver therapeutic suggestions for pregnancy-related carpal tunnel syndrome. Conservative treatment with local corticosteroid injections into the carpal tunnel and night time neutral wrist splints are considered to be the first line treatment plan. NSAIDs give pain relief, and suppress inflammation (13) steroid injection replaced diuretics and is equally effective with less systemic side effects (12). Some researcher has reported that a deficiency of pyridoxine (vitamin B6) leads to the development of Carpel Tunnel Syndrome, so oral supplementation of Vitamin B6 pyridoxine is recommended to prevent CTS in pregnant females (13). Carpal tunnel syndrome needs to be managed conservatively in pregnant females as symptoms commonly resolve postpartumly. Splinting is done in the wrist at a neutral angle which helps to reduce repetitive flexion and rotation, helps in the relieve of mild soft tissue swelling when applied within three months of the onset of symptoms can be most effective. Night splint usage is suggested to avoid continued wrist flexion or extension (8). Neutral position maximizes carpal canal volume and reduces pressure on the median nerve. Splints can be worn during the day if needed. Steroid injection gives

temporary relief in 80% of patients and avoiding extreme flexion or extension and as well as prolonged exposure to vibration is helpful (9). For short time management oral corticosteroids may be found highly effective whole local injections of corticosteroid may relieve the symptoms for a longer duration (8). Corticosteroids can be used both as therapeutically and also as a diagnostic tool (3). In the short term treatment of Carpel Tunnel Syndrome Oral corticosteroids have been found more effective than the use of diuretics or NSAIDs. A recent systematic review proved that NSAIDs, pyridoxine, and diuretic has placebo effect in relieving CTS symptoms (8). Some Studies do not pleasingly support NSAIDs usage in pregnancy, except for ibuprofen also continuous exposure to NSAIDs, or taking them after 30 weeks, is linked with the high possibility of premature fetal ductus arteriosus closure and oligohydramnios due to its inhibitory results on activity of prostaglandin (14). In the longer-term management of carpal tunnel syndrome Ultrasound therapy may be helpful (8). Splinting has been used in the treatment of CTS for above 40 years; however, randomized studies conducted on its usefulness and efficiency are very few (11). A few trials showed that it's better to have splint at night then no splint with very less side effect. Splinting is low-cost and linked with few complications and should be the first option of the treatment, specifically in moderate to mild cases of CTS. Splints deliver some instant relief in symptoms in severe cases for patients undergoing surgical treatment. Splints should be recommended for at least 4 weeks, and relief commonly occurs within the initial 2 weeks. Full-time splinting may be more effective than night-only splinting, and neutral position splints relieve symptoms better than cock-up (extension) splints (10). Splinting and patient education about positioning, help in reduction of the painful symptoms of PRCTS In the general population, CTS treatment involve surgical intervention when symptoms are progressive and conservative treatment is no more effective, while 85% of cases of PRCTS usually recover within 2 to 4 weeks postpartum so patient must be kept comfortable and surgery is recommended when conservative management fails or shows

significant nerve compression to elect diagnostic studies. The PRCTS patient shows 3 to 4 times more improvement than non-pregnant patients with Carpel Tunnel Syndrome. 82% of cases are resolved by using splints alone (7). Carpal tunnel release surgery is done by using regional anesthesia. The surgical method uses a long palmar curvilinear incision to divide the transverse carpal ligament and its overlying structures. A new procedure Endoscopic carpal tunnel release allows the transverse carpal ligament division with intact overlying structures; this procedure lessens scar formation and allows a faster come back to work and professional activities of daily life. The wrist is generally immobilized for three to four weeks post surgically (8). Excellent results are reported after surgical decompression by 98% of pregnant patients. Most PRCTS have complete resolution after delivery, however, some of the pregnant patients may not feel well after delivery and may need constant conservative management or surgical treatment after the delivery (7). Reduction in symptoms postpartum has a correlation with weight loss, a recent report of 1 and 3-year postpartum follow-up showed that at 1 year, 84% of patients still had reduced median distal sensory conduction velocities despite symptomatic and electrodiagnostic improvement. At 3 years, 49% of patient have complaints of symptoms and 11% still wore a splint (9). Postsurgical care involves hand elevation, hand, and forearm gradual exercise, and wrist splinting for 2 to 3 weeks in a neutral or slightly extended position. Early mobilization, instead of splinting, may cause shorter time for coming back to actions of daily living or work (10). Stretching the adhesions in the carpal canal, nerve and tendon gliding exercises, helps in expanding the area of contact between the transverse carpal ligament and median nerve, improving venous return from area of the nerve bundles, reduction of pressure inside the carpal tunnel, decrease in edema of tenosynovial by a milking action (15). Rate and force of the exercises should not be so strong that the intensity of symptoms is elicited. The gliding exercises are found to be more effective in the movements of the nerve directly, to facilitate the venous return and for the reduction of edema

(12). Females who do not get any benefit from splitting or alteration of repetitive actions can experience relief by preventing breastfeeding and other activities of daily life which needs excessive hand movements or activities. Some of them used steroid injections locally (6). Musculoskeletal manipulation is extensively used it involves massage, exercise, and mobilization of the wrist joint (16).

The rationale of this study was based on the facts that there were no previous researches on PRCTS in Pakistan, its prevalence was unknown among Pakistani pregnant females as some studies show it is the second most common musculoskeletal condition among pregnant females.

MATERIAL AND METHODS

Place of study

The study is conducted in Faisalabad the 3rd largest city of Pakistan. After the approval of synopsis from the research committee of the directorate of medical sciences GCUF, the data was collected, from the pregnant females of Faisalabad who came for the routine check-up in the DHQ and Allied hospital. Data was collected from gynecological OPD of DHQ and Allied hospitals of Faisalabad from the pregnant females.

Study design

Observational and cross-sectional study design

Duration

The duration of the study was five months from September 2017 to January 2018, after the approval from research committee of the Directorate of Medical Sciences GCUF.

Inclusion criteria

The pregnant women visiting for the consultation for their pregnancy in the Gynae ward, without the prior symptoms of CTS were included in the study. The women lying in the age group of 20-40 either primigravida or multigravida was made the part of the study. Both educated and un-educated pregnant women belonging to any of the socio-economic backgrounds were included.

Exclusion Criteria

The women with the prior history of CTS were

not included. Women with any other cervical radiculopathy, any fracture of the wrist, injury or trauma to the hand leading to chronic pain in neck or arm, gout, osteoarthritis, women with Diabetes mellitus, thyroid disease. Drugs, smoking and alcohol addiction reported by any women was also eliminated.

Sample Size

The sample size was composed of 300 participants, all these pregnant females were enrolled in the study from the DHQ and Allied hospitals of the Faisalabad.

Data Collection Procedure

In this observational cross-sectional study, data was collected from pregnant females who visited DHQ and Allied hospitals of Faisalabad. The consent form was signed before starting the procedure, 300 pregnant females from the gynecological outdoor patient ward were enrolled in the study to identify pregnancy-related Carpal tunnel syndrome. The ethical values, moral, and the society norms were kept in mind while attaining the data. For the diagnosis, History was taken and the patients were asked about symptoms of pain, weakness and numbness/tingling in their hands or wrist. Afterward, the special diagnostic clinical tests for CTS were performed on the patients to confirm the diagnosis. These provocative tests namely Durkan compression test, Tinnel sign test, and Phalen's test were performed. Durkan compression test provokes the symptoms as the median nerve was compressed for 30 secs, whereas in the Tinel signs the median nerve was tapped at the level of the wrist with hammer head or with the fingers. The Phalen test, in which wrists are flexed and dorsal surface of hands pushed against each other for 60 secs, was also used. It was decided that for confirming the diagnosis of PRCTS and claiming the pregnant patient for having CTS, the patient should have shown anyone positive symptom out of all three symptoms and should have shown positive values for at least one of clinical provocative test performed out of all three. The Pregnant patients declared for having carpal tunnel Syndrome were asked to fill out the questionnaire which was based on the severity of the symptoms and the

functional impairment affecting their activities of daily living. The questions were narrated in easy language that could easily be understood by the layman patient. The data was collected in the hard form and was entered in the SPSS-23 for further analysis.

Data Collection Tool

A standardized Boston Carpel Tunnel Questionnaire modified according to our own study was used to check the functional impairment and the severity of the symptoms of CTS in the pregnant females. It was further modified according to the need of the project. The basic sign and symptoms, numbness/tingling, pain, and weakness were also interrogated by everyone. The pain rating scale was used to quantify the pain out of 10. The zero shows no pain, while 5 exhibits the pain at a moderate level and 10 illustrates the unbearable pain. It was further divided, 0 to 2 was considered less pain, 4 to 7 was considered as the moderate pain, 8 to 10 was considered as the severe pain. The data was taken manually and it was made sure that each form was filled under the researcher's supervision.

Data Analysis

For data analysis, the SPSS-23 system was used. Data were coded and then entered to SPSS 23 for the analysis and results formation.

RESULTS

Data is analyzed by using the Statistical Package for the Social Sciences (SPSS) 23. Frequency distribution and percentages of each variable are illustrated by the help of tables and bar charts. Similarly, chi-square is used to represent the relationship between variables

Table.1 shows PRCTS sign and symptoms that are numbness/Tingling, pain and weakness present in pregnant females shows that total cases included in study irrelevant of CTS sign and symptoms are 300 out of which all three sign and symptoms are present in 103 pregnant females i.e. 34.3% out of total 100%; there are only 4 cases which have only one CTS sign and symptom i.e. 1.3% and finally 193 cases i.e. 64.3% do not show any of the CTS sign and symptom.

Table. No. 1: Classification of respondents with respect to sign and symptoms

Symptoms	Frequency	Percent
0- symptom	193	64.3
1- symptom	4	1.3
3 symptoms	103	34.3
Total	300	100.0

Table 1.1 shows Numbness/Tingling out of total 300 cases there are 105 cases i.e. 35.0% have positive values for symptoms of Numbness and Tingling in hand and 195 cases with 65.0% have negative values that show they don't have Numbness/Tingling in their hand.

Table: 1.1: Classification of respondents with respect to Numbness/Tingling

Symptoms	Frequency	Percent
No	195	65.0
Yes	105	35.0
Total	300	100.0

Table: 1.2 shows PRCTS Pain out of total 300 cases there are 103 cases i.e. 34.3% show positive values for symptoms of pain in hand and 197 cases with 65.7% shows negative values for the pain symptom that shows they don't have pain in their hand.

Table: 1.2: Classification of respondents with respect to Pain

Symptoms	Frequency	Percent
No	197	65.7
Yes	103	34.3
Total	300	100.0

Table 1.3 shows Weakness out of total 300 cases there are 105 cases i.e. 35.0% show positive values for symptoms of weakness in the hand and 195 cases with 65.0% show negative values for the weakness symptoms that show they don't have weakness in their hand.

Table: 1.3: Classification of respondents with respect to weakness

Symptoms	Frequency	Percent
No	195	65.0
Yes	105	35.0
Total	300	100.0

Table. 2 shows provocative physical tests namely Tinels, Phalen's and Durken compression test to diagnose pregnancy-related Carpal Tunnel Syndrome. It shows that a total of 300 cases included in study on which all three Test were applied out of which all three tests were positive in 103 cases i.e. 34.3% of the total cases, while all three Test show negative value for 197 cases i.e. 65.7% of the total cases.

Table. No. 2: Classification of respondents with respect to the Provocative test

Symptoms	Frequency	Percent
0- positive test	197	65.7
3- positive test	103	34.3
Total	300	100.0

Table 2.1 shows Tinel's sign out of total 300 cases on which Tinel's sign test was performed 103 cases i.e. 34.3% shows positive value for a test while 197 cases with 65.7% show a negative value for the test.

Table:2.1. Classification of respondents with respect to Tinel's sign

Test	Frequency	Percent
Negative	197	65.7
Positive	103	34.3
Total	300	100.0

Table 2.2 shows Phalen's sign Test out of total 300 cases on which Phalen's sign test was performed 103 cases i.e. 34.3% shows positive values for the test while 197 cases with 65.7% show negative values for the test.

Table 2.2 Classification of respondents with respect to Phalen’s Test

Test	Frequency	Percent
Negative	197	65.7
Positive	103	34.3
Total	300	100.0

Table 2.3 shows Durken Compression Test, out of total 300 cases on which Durkan Compression test was performed 103 cases i.e. 34.3% shows positive values for the test while 197 cases with 65.7% showed negative values for the test.

Table 2.3: Durkan compression Test

Test	Frequency	Percent
Negative	197	65.7
Positive	103	34.3
Total	300	100.0

Table 2.4 shows combined results for sign and symptoms among total 300 cases, all three sign and symptoms were present in 103 (34.3%) case and 4 (1.3%) cases present with only one kind of symptom while 193 (64.3%) cases show the absence of symptoms.

Numbness/tingling was present in 105 (35.0%) of the case and absent in 195 (65.0%) of cases.

The pain was present in 103 (34.3%) of cases and absent in 197 (65.7%) of cases while Weakness was present in 105 (35.0%) of cases and absent in 195 (65.0%) of cases.

Table 2.4 shows combined results for provocative physical tests, total 300 cases on which all three test namely Tinel’s, Phalen’s and durken compression test were applied out of which 103(34.3%) shows positive values for all three test and 197(65.7%) shows negative value for all three test i.e Tinel’s Phalen’s and Durken Compression Test.

Table.2.5:Classification of respondents with respect to symptoms and physical test

	Frequencies Total=N=300	Percentage Total=100%
No of total symptoms present	.00=no symptom=193 1.00=one symptom=4 3.00= three symptoms=103	64.3% 1.3% 34.3%
Numbness/ Tingling	No=195 Yes=105	65.0% 35.0%
Pain	No=197 Yes=103	65.7% 34.3%
Weakness	No=195 Yes=105	65.0% 35.0%
Total provocative test positive	0=No test positive =197 3=all test positive =103	65.7% 34.3%
Tinnels sign	Negative = 197 Positive = 103	65.7% 34.3%
Phalens test	Negative = 197 Positive = 103	65.7% 103%
Durkan compression test	Negative = 197 Positive = 103	65.7% 103%

These results show the prevalence of carpal tunnel syndrome in pregnant females is 34.3%, total 103 cases have both symptoms and provocative physical test positive out of the total 300 cases. There were four cases, each having one symptom either weakness or numbness positive among all four of them while all provocative clinical tests were negative, so all these four cases were not considered as cases of CTS, their symptoms

of weakness and numbness were referred to as generalized body weakness and numbness present during pregnancy.

DISCUSSION

The prevalence of Carpel Tunnel Syndrome is reported to be higher in some professions, especially those requiring forced or repetitive hand motions. In this research study, the prevalence of CTS found to be higher in the pregnant females in the area Faisalabad, Pakistan. The intensity of pain and functional loss level was greater in pregnant females with CTS. Carpal tunnel syndrome is most often seen as general community health issue. Although various pathological tests and strategies have been recommended for the confirmed diagnosis of Carpel Tunnel Syndrome, level of clinical features and electrophysiological assessments are viewed as the most solid analytic instruments (17). Three comparative tests have been employed to enhance the reliability, specificity, and sensitivity of NCS to assess and diagnose Carpel Tunnel Syndrome. Abnormal is characterized as 0.9 ms and carries level of specificity of 95% sensitivity of 83%.

CTS is reported more commonly in employed people than unemployed people in the general population but overall its incidence is reported in the large interval as 0.1 to 10%. This Study discussed that the prevalence of carpal tunnel syndrome in pregnant females of Faisalabad according to the severity of symptoms and functional limitation based on Boston carpal tunnel questionnaire.

The prevalence of Carpal Tunnel syndrome in pregnant females is still unknown and literature varies in reporting prevalence of Pregnancy-related carpal tunnel syndrome, our study has based its diagnosis on history taking, clinical sign and symptoms and provocative physical test and has find out the prevalence of pregnancy-related carpal tunnel

syndrome is (34.3%), which is in accordance with the studies of whose studies has also shown prevalence of 34% (16). Which has reported the incidence of Pregnancy-related carpal tunnel syndrome ranged from 31% to 62% diagnosed clinically, also in accordance with the previous study (18) who reported pregnancy-related carpal tunnel syndrome incidence to be 2.3% to 35% with the help of clinical diagnosis. Our study has used BCTQ as it is a standardized, patient-oriented based outcome measure to check the symptoms severity and functional status in patients having carpal tunnel syndrome, as also used BCTQ in their research to check symptoms severity and functional status. We preferred using BCTQ in this study as it was found to be effective, reliable, responsive and it is a satisfactory tool for accessing CTS (19). our studies showed numbness/tingling in hand was severe in most of the patients 60.2% also at night time numbness/tingling was severed in most of the patients 52.4%, causing 2-3 times night awakenings in most of the patient 44.7%, so our finding shows that the numbness/ tingling are prominent symptoms among all other symptoms followed by pain and are in agreement with the previous study (20) in which numbness and tingling sensation were prominent symptoms among all other symptoms, but here is the difference, our studies show numbness/ tingling is severe in night which is in accordance with the most of the already present literature while studies of previous study shows that the symptoms of numbness and pain are mostly present at daytime as compared to night time (20).

CONCLUSION

According to pain numeric rating scale mostly patient reported severe pain followed by moderate pain and then less pain. Most of the patients had symptoms in previous pregnancies. PRCTS, sign and symptoms

were checked and provocative physical test was performed on all the individuals. All three symptoms were reported and all three tests were found to be positive confirming diagnosis in 103 (34.4%) patients, while only four patients showed one of the three

symptoms individually but didn't give positive value for any of the provocative test. Thus, this study demonstrates a significant relationship between the presence and severity of carpal tunnel syndrome in pregnant females in Faisalabad district of Pakistan.

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