Original Article

Prevalence of Carpal Tunnel Syndrome in Third Trimester of Pregnancy

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ABSTRACT

Objective: To find out the prevalence of carpal tunnel syndrome in women during the third trimester of pregnancy.
Study Design: Cross-sectional survey research study
Place and Duration of Study: This study was conducted at the conducted at the Department of Physiotherapy, CMH, Lahore from Oct 2020 to March 2021.
Materials and Methods: Three hundred and twenty-two pregnant women in the third trimester had participated in this study taken from both private and government hospitals, aged between 18 to 40 years, women with a history of multigravida and prim gravida were included. Data was shown in the form of frequencies and percentages. A cross-sectional survey was used for research. A validated questionnaire (Boston Carpal Tunnel Syndrome questionnaire) was used as a tool for data collection.
Results: 29.11% of women were reported with carpal tunnel syndrome in their third trimester of pregnancy.
Conclusion: The severity of hand or wrist pain at night, frequency of pain in hand or wrist at night, numbness and tingling sensation in hand.
Key Words: Carpal tunnel syndrome (CTS), Median neuropathy, Third trimester, Entrapment, Boston carpal tunnel questionnaire

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INTRODUCTION

Carpal tunnel syndrome (CTS) is symptomatic neuropathy caused by compression of the median nerve at the level of the wrist. It's characterized by discomfort, numbness, and tingling sensation in the hand, which progresses to decreasing muscle strength and sensory loss. The symptoms might be confined in the hand, or they might radiate upto the elbow. Patients frequently report waking up in the middle of the night and shaking their hands for relief.

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This is known as the flick sign, and it is 93% sensitive and 96% specific for CTS.[1] The canal on the volar side of the wrist is known as the carpal tunnel. The Piriformis bones, a hook of Hamate on the medial side, and Scaphoid and Hamate on the lateral side are the bones that bind it. Flexor Retinaculum connective tissue surrounds these bones and forms a tunnel. Carpal tunnel syndrome is caused by entrapment of the median nerve at two levels: either at the narrow section of the hook of Hamate or by wrist flexion at the proximal border of the carpal tunnel, either owing to tunnel narrowing or swelling of the palmer's tendons.[2]

Carpal Tunnel Syndrome is usually attributed to hereditary factors or idiopathic. The nocturnal rise in carpel pressure in idiopathic carpal tunnel syndrome could be linked with many mechanisms, like shifting of lymphatic drainage of the upper limb in the supine position, a lack of muscle pump mechanism that assist significantly in the outflow of interstitial fluid in the carpal tunnel, a placing of the wrist in bending position, enhancing intra-canalicular pressure, also later night spike in BP and decrease cortisol hormone.[3] Thyroid dysfunction and diabetes mellitus, menopause, sedentary lifestyle, pregnancy, and inflammatory arthritis of the wrist joint are all secondary disorders that reduce the tunnel's space.[4] And also many diseases mimic the characteristics of carpal tunnel syndrome, but they do not include the median nerve, so medical practitioners narrow down the real finding.[5]

Pregnancy is divided into three trimesters. The most prevalent problem of the last trimester is carpal tunnel syndrome (CTS) with unknown cause. As typically pregnancy lasts between 37 and 42 weeks, during which time the body undergoes various changes to support the developing fetus. The median nerve may be compressed due to a variety of changes connected to pregnancy. Many hormone levels, including angiotensin, rennin, and progesterone, rise in response to physiological changes, resulting in fluid retention, weight gain, fetal growth, and edema. Weight gain during pregnancy may raise the risk of carpal tunnel syndrome, but a more well-known cause is widespread edema, which causes local swelling. Carpal tunnel syndrome is more likely in pregnant women with preeclampsia.[6]

Clinically significant examination finding for the assessment is Phalenmaneuver, flick sign, and median nerve compression test.[1] Boston carpal tunnel questionnaire is a standardized score to predict the severity of Carpal tunnel syndrome (CTS). Usually for secondary conditions imaging is recommended for the affirmation of carpal tunnel syndrome. It is investigated based on symptoms presentation in the clinical setting and affirmed by Electromyogram (EMG) and ultrasonography criteria are very reliable.[7] Along with that median nerve or tunnel, swelling is more accurate for diagnosis through ultrasonography.[8]

Treatment of CTS is surgical and nonsurgical both depending upon the severity of symptoms. Its management must start with the appearance of symptoms.[9] Carpal tunnel syndrome symptoms that normally show during the third trimester may manage and resolve after pregnancy non-operatively.[10]

Meems et al. conducted a cohort study in 2015 to determine the frequency, severity, and edema of pregnancy-related CTS syndrome symptoms in gravida. In the Netherlands, he took a sample of 693 pregnant women. He utilized the Boston carpal tunnel questionnaire to measure Carpal Tunnel Syndrome indications in all trimesters. Edema and sleep difficulties were recorded at several points throughout the pregnancy. To measure depression, he used the Edinburg depression scale. Symptoms of carpal tunnel syndrome were reported in 219 women. The Boston Carpal Tunnel Questionnaire was quite raised after 32 weeks. Only a few women have severe symptoms, although it was observed that pregnant women with Carpal Tunnel Syndrome have higher fluid retention than those who do not have CTS symptoms. The presence of Carpal Tunnel Syndrome has nothing to do with sleep issues.[11]

Descriptive cross-sectional research on pregnant women was undertaken by Khosrawiet al.[12] To diagnose carpal tunnel syndrome, he employed ultrasound imaging, the Boston Carpal Tunnel Questionnaire (BCTQ), and the functional status scale. A total of 100 patients, ranging in age from 17 to 41 years, were studied. CTS affected 19 percent of the population, with bilateral CTS accounting for 47% of the total, and severe CTS accounting for 26.3%. Clinical indications had a sensitivity and specificity of 52% and 23% respectively, when compared to electrodiagnostic results. Pregnancy without indications of CTS before conception was the only criterion for inclusion. Women who had trauma or fracture were excluded.[12]

Syed Rehan Iftikhar Bukhari et al conducted an observation and cross-sectional study. He used Boston Carpal Tunnel Questionnaire, Ultrasonic imaging, functional status scale to confirm the diagnosis. A total of 300 patients ages ranged from 20 – 40 years were included in the research. And among them, 103 patients showed all the symptoms and signs positive and having a prevalence of 34.3%. Out of 300 patients, 103(34%) patients had CTS, and 193 (64%) cases did not show any CTS symptoms.[13]

Yazdanpanahet al[14] had conducted a cross-sectional analytical study. He used ultrasonic imaging, Boston Carpal Tunnel syndrome, Functional status scale to confirm the diagnosis. Total 2656 non-pregnant women and 1508 pregnant women and having the prevalence of pregnant and non-pregnant 3.4% and 2.3 % respectively. 51 pregnant women had CTS. 59% had mild,18.8% had moderate and 21% had severe CTS. Women suffered from paresthesia (88%) and in the physical exams were Tinel's signs (58.9%) and Phalen's test (50.9%).

MATERIALS AND METHODS

This cross-sectional survey research was conducted in different hospitals within six months, from Oct 2020 to March 2021 and comprised 322 patients. Pregnant women with no prior history of carpal tunnel syndrome, Age between 18 to 40 years, women with history of multigravida and primigravida were included. Exclusion criteria involves women who have cervical radiculopathy and osteoarthritis, women who have fracture of wrist or any trauma that leads to chronic pain in arm, age <18 and >40 years. Data was analyzed by using SPSSV-22.

RESULTS

Prevalence of carpal tunnel syndrome in pregnant women during third trimester was 29.11%. Women with severity of hand and wrist pain at night was 45.3%, 31.4% had hand or wrist pain during daytime and 38.8% women feels numbness or tingling sensation in hand. 54.7% participants were normal, 27.6% had slight,12.1% had medium 2.8% had severe, 2.8% had very serious pain in wrist or hand at night (Table 1).

72% were normal, 16.1% had 1-2times/day, 7.4% had 3-5times/day, 3.1% had more than 5 times, 1.2% had continued wrist or hand pain during day time (Fig. 1).

61.2% were normal, 22.7% had slight, 11.8% had medium, 3.7% had severe, .6% had very serious numbness or tingling at night (Table 2).

Table No.1: Severity of hand or wrist pain at night (n=322)

Variable	No.	%
Normal	176	54.7
Slight	89	27.6
Medium	39	12.1
Severe	9	2.8
Very serious	9	2.8

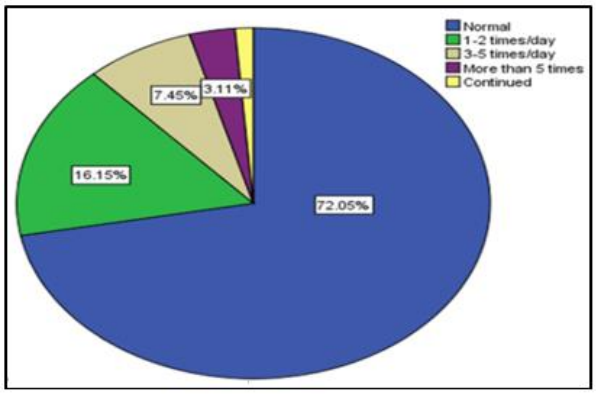

Figure No.1: Frequency of hand or wrist pain during daytime

Table 2: Numbness or tingling at night (n=322)

Variable	No.	%
Normal	197	61.2
Slight	73	22.7
Medium	38	11.8
Severe	12	3.7
Very serious	2	0.6

DISCUSSION

The study focused on the "prevalence of Carpal Tunnel Syndrome in the Third Trimester of pregnancy" in Lahore. This topic has a great importance as there is high prevalence of Carpal Tunnel Syndrome during pregnancy especially in the third trimester, by finding the prevalence, we will be able to educate the women about its symptoms and get it diagnosed and treated as early as possible. The results of this study reflected that women in their third trimester of pregnancy had the highest risk of developing Carpal Tunnel Syndrome. Most of the studies till 2019, different were discussed by different authors separately, in their respective studies. But this study considered all major and most significant variables, which are related to each other. Also these variables are greatly associated with the prevalence of Carpal Tunnel Syndrome in pregnant women in their third trimester.

Guan.[15] used the Boston Questionnaire to measure the severity of the symptoms and functional status. He took the sample of 482 pregnant women, results of the study showed prevalence of 23.03%, whereas in our study, we took the sample of 322 pregnant women, result showed prevalence of 29.11%.[15]

A study conducted by Bukhari[13], they used the Boston Questionnaire. He took 300 pregnant women ranging from 20 to 40 years, out of them 103 pregnant women showed positive results of Carpal Tunnel Syndrome and had a prevalence of 39 34.3%. While in our study, we took 322 pregnant women, results showed 29.11% prevalence of Carpal Tunnel Syndrome.[13].

CONCLUSION

Prevalence of Carpal Tunnel Syndrome in different trimesters of pregnancy in Pakistan and educate them to avoid this syndrome to convert into a more severe and debilitating condition by using proper techniques and preventive measures.

Author's Contribution:

Concept & Design of Study:	Sameena Pari
Drafting:	Mehwish Niaz
Data Analysis:	Laraib Khan, Rida Aziz, Aneela Aslam
Revisiting Critically:	Sameena Pari, Ayesha Siddiqa
Final Approval of version:	Sameena Pari

Conflict of Interest: The study has no conflict of interest to declare by any author.

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