

## Carpal tunnel syndrome and its associated factors in third trimester of pregnancy

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**Objective:** To assess Carpal tunnel syndrome (CTS) presence and its associated factors in third trimester of pregnancy.

**Methodology:** By using convenient sampling this cross-sectional study of 150 Patients was done in 6 months at Madinah teaching Hospital and Allied Hospital, Faisalabad. Boston Carpal tunnel questionnaire, Tinel's test and Phalen's test were used. Data were analyzed through SPSS version 20.

**Result:** Out of 150 females, Only 24(16%) had CTS symptoms measured through Tinel's test and Phalen's test. There was no significant

association ( $P=0.179$ ) between CTS and third trimester of pregnancy. CTS occurrence was not associated ( $P=0.251$ ) with age of patient.

**Conclusion:** The study shows low presence of CTS in third trimester of pregnancy. Moreover, there is no significant association exists among age of patient, month of pregnancy and carpal tunnel syndrome. CTS can occur at any age and during any month of pregnancy. (Rawal Med J 202;45:367-369).

**Keywords:** Carpal tunnel syndrome, Boston carpal tunnel questionnaire, Tinel's test, Phalen's test.

### INTRODUCTION

Carpel tunnel is an osteofibrous canal present in the lower part of wrist. It consists of nine flexor tendons (flexor pollicis longus, four flexor digitorum superficialis and four flexor digitorum profundus) and median nerve. When contents in the canal increase due to; trauma, fracture, fluid retention, swelling and hormonal changes, median nerve is compressed.<sup>1</sup> Carpal tunnel syndrome (CTS) is median nerve involvement in the wrist causing numbness, prickling and fleshing impression along the pathway of median nerve in the arm. Tinel's, Phalen's and median nerve compression tests reproduce the CTS manifestations.<sup>2</sup>

Alcohol intake, diabetes, low thyroid hormone, malformation, gestation and obesity are related to CTS.<sup>3</sup> It is more prevalent in women having history of depression, miscarriage and marital problems.<sup>4</sup> Fluid retention highly affects the females in pregnancy causing CTS but tobacco use and alcohol have minor affects.<sup>5</sup> BMI greater than 30 are more prone to develop CTS.<sup>6</sup> Median nerve function is damaged due to many factors like forceful activities, repetitive functions, overweight, hyperglycemia and Sensation loss is influenced by psychological factors.<sup>7</sup>

Pregnancy involves physical, physiological and

psychological changes. These changes include fluid retention and hormonal alterations (raised level of progesterone). Due to these changes compression of median nerve occurs in the carpal tunnel. With the progression of pregnancy hormonal changes increase as a result tissue inflammation reducing the mobility of joints and compression of nerve further increases in third trimester.<sup>4</sup> In pregnancy, 0.8%-70% women have hormonal changes,<sup>8</sup> and in third trimester 2.3% to 4.6% out of 9.6% of all pregnant women have this syndrome.<sup>9,10</sup>

In some women symptoms disappear after the delivery of baby, while in some women pain and numbness persist for several months. Incidence of carpal tunnel syndrome is high in women as compare to males.<sup>11</sup> Warning sign of CTS e.g. pain, numbness and tingling sensations along the pathway of median nerve are more severe in women than men.<sup>12</sup> Tinel's sign is positive in 95% patients.<sup>13</sup> Malay race in Malaysia was the mostly affected (87%) with CTS and these females were in the third trimester of pregnancy.<sup>14</sup> The purpose of this study was to assess the presence of CTS and its associated factors in the third trimester of pregnancy in the hospitals.

### METHODOLOGY

This observational cross sectional study was

conducted on 150 pregnant females in their third trimester at Allied hospital and Madinah Teaching Hospital for 6 months. Women aged between 25 to 40 years, having born more than one child or giving birth for the first child were included for data collection. While those having previously CTS, any psychological condition and diabetes mellitus were excluded from the study. The subjects were enrolled after taking an informed consent.

Data were collected by using of the Boston protocol questionnaire (BCTQ) which is a reliable, consistent and satisfactory protocol used specifically for the patients of CTS. CTS were diagnosed through Tinel's test and Phalen's test. The questionnaire is divided into two parts, first part describes the severity of symptoms (11 questions) and second part explains about functional limitations (8 items).<sup>15</sup> Information like name and age other parameters including pain, its type, intensity, duration, timing, dormancy, tingling sensation and hand weakness were also analyzed in this questionnaire.

**Statistical Analysis:** The data were analyzed by SPSS version 20. Descriptive statistics were applied upon quantitative variables and Chi-square test for association was used for qualitative variables.

## RESULTS

Out of 150 pregnant females, 24(16%) were diagnosed CTS through Tinel's test and Phalen's test. There was no correlation exists between CTS and age of patient ( $P=0.251$ ) (Table 1).

**Table 1. Independent Sample T-test between CTS and age of patients.**

CTS Status		N	Mean	Std. Deviation	Std. Error Mean
Age of patient	Negative	126	27.66	3.165	0.282
	Positive	24	28.50	3.822	0.780

**Table 2. Carpal Tunnel Syndrome and month of pregnancy.**

	Month of pregnancy			Total
	7 <sup>th</sup> month	8 <sup>th</sup> month	9 <sup>th</sup> month	
Negative	36 (92.30%)	47(78.33%)	43(84.31%)	126(84%)
Positive	3(7.69%)	13(21.66%)	8(15.68%)	24(16%)
Total	39(26%)	60(40%)	51(34%)	150

**Table 3. Boston Carpal tunnel Questionnaire.**

	N	Minimum	Maximum	Mean	SD
Boston severity score	24	1.000	4.909	3.12833	1.088521
Boston functional score	24	1.000	5.000	2.56771	1.254870

Out of 150 women, 39 were in 7<sup>th</sup> month of pregnancy 36 did not complain of CTS symptoms and 3 females complaint of CTS. In the same way, 60 females were in 8<sup>th</sup> month in which 47 have showed negative results and 8 have showed positive results. 51 females were in 9<sup>th</sup> month, out of them 43 had not complain of CTS and 8 females have showed positive CTS. There was no association between CTS status and month of pregnancy ( $P=0.179$ ) (Table 2). Boston severity score was  $3.12833 \pm 1.088521$  while Boston functional score was  $2.56771 \pm 1.254870$  (Table 3).

## DISCUSSION

This study found no significant association between age of patient and CTS as the value ( $P=0.251$ ). Tinel's and Phalen's tests were used for diagnosis. CTS was positive in pregnant females having mean age of 28.50 and negative in females having mean age of 27.66, showing that CTS is not affected by the age. These results are similar to those reported by Hanif et al.<sup>1</sup> Some authors suggest that incidence of CTS increases with the age due to increase body weight with age,<sup>6,17</sup> Stevens et al also reported that risk of CTS increases as the person gets older.<sup>18</sup> CTS during pregnancy is related to fluid retention. All females experience fluid retention during pregnancy, however its level varies from female to female. Some females retain more fluid as compared to other females due to hormonal changes. The result of our study showed that pregnancy had no significant affect on CTS occurrence because mostly females did not complain of symptoms this reveals that less fluid accumulate in them.

We found that very few cases experienced difficulty during performance of functional activities. Symptoms did not aggravate with the passage of time, and remained constant throughout the gestation period. The symptoms did not reduce the

ability of the person to perform activities of daily living.

## CONCLUSION

The study shows low presence of CTS during third trimester of pregnancy. Further, there was no significant association with age of patient, month of pregnancy. CTS can occur at any age and it can also occur during any month of pregnancy.

### Author contributions:

Conception and design: Shaheen Noor  
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Analysis and interpretation of the data: Shaheen Noor, Aneela Sana, Rabia Tariq, Aqsa Tariq, Hina Tahir

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