

# Risk Factors for Carpal Tunnel Syndrome in Pregnant Women: A Literature Review

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## Abstract

Carpal tunnel syndrome (CTS) is a symptom of compression neuropathy that occurs in the hands, specifically the median nerve. The incidence of carpal tunnel syndrome in adults is known to be around 0.7% -9.2% in women, while in men it is around 0.4% -2.1%. The incidence of carpal tunnel syndrome has a 3x greater risk in women compared to men and 2-3 times more common in pregnant women than those who are not pregnant. The purpose of this paper is to determine the risk factors for carpal tunnel syndrome in pregnant women. This research is a literature review as secondary research with analytic research type using observational research methods and quantitative approaches. This literature search was conducted at JKII using keywords such as carpal tunnel syndrome, pregnant women, and risk factors. The etiology of CTS during pregnancy is still unknown but there are several risk factors that can cause carpal tunnel syndrome in pregnant women such as edema or water retention, hormonal changes, gestational hypertension with preeclampsia, diabetes mellitus, hypothyroidism, nerve hypersensitivity, sleeping position, relaxin hormone, increase in fatty tissue during pregnancy, and changes in uterine size.

Keywords: Carpal Tunnel Syndrom, Pregnant Women, Risk Factors

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## Introduction

The incidence of carpal tunnel syndrome in adults is known to be around 0.7% -9.2% in women, while in men it is around 0.4% -2.1%. [1]. The incidence of carpal tunnel syndrome has a 3x greater risk in women compared to men. This disease is more common in women aged 45-54 years. The incidence of Carpal tunnel syndrome is also 2-3 times more common in pregnant women than those who are not pregnant [2, 3]. Until now the cause of carpal tunnel syndrome is still unknown (idiopathic). Carpal tunnel syndrome is often associated with several diseases such as hypertension, diabetes mellitus, hypothyroidism, rheumatoid arthritis, and leukemia multiple myeloma. In addition, workers who perform repetitive movements and pregnant women are more likely to suffer from carpal tunnel syndrome [4]. Therefore, the purpose of this paper is to determine the risk factors for carpal tunnel syndrome in pregnant women.

## Methods

This research is a literature review as secondary research. A literature search was conducted at JKKI using keywords such as carpal tunnel syndrome, pregnant women, and risk factors. The research method used is the observational method using a quantitative approach with the type of analytic research.

## Results

Carpal tunnel syndrome (CTS) is a symptom of compression neuropathy that occurs in the hands, specifically the median nerve. This disease is usually characterized by decreased nerve function and increased pressure in the carpal tunnel. Complaints such as pain, tingling and numbness along the median nerve are often felt by CTS patients [2, 3]. The clinical symptoms of CTS that are often felt are: burning, tingling and numbness in fingers and palms; pain in the palm, wrist, and or forearm, especially when the hand is being used; there is a decrease in hand grip strength; thumb experiencing weakness; sensation of swelling in the finger (swelling can be seen or not seen); it is difficult to distinguish between hot and cold sensations [5]. The diagnosis of CTS can be known by conducting anamnesis and clinical examination such as nerve percussion test (Tinel Test), wrist flexion (Phalen Test), Compression Test, the Semmes-Weinstein Monofilament Test (SWMT), and the Two Point Discrimination test [6].

The etiology of CTS during pregnancy is still unknown, but several factors are said to be related, such as age, edema, hormones, weight gain during pregnancy, smoking, and alcohol [7, 8]. The factor that is said to be the most frequent cause of CTS during pregnancy is fluid retention. During pregnancy there is an increase in plasma and erythrocyte volume which then causes an increase in blood volume [7, 8]. Changes in hormone fluctuations in pregnant women, such as estrogen, progesterone, renin, and angiotensin also affect the occurrence of CTS. Hormone fluctuations cause fluid retention which then causes swelling and compression of nerves in the carpal tunnel. Fluid retention during the last trimester of pregnancy causes swelling of the face, hands and feet which then results in stiffness in the joints and nerve compression syndromes, such as CTS [9].

CTS can also be caused by the hormones estrogen and progesterone. Research conducted by Toesca (2017) shows that the number of estrogen and progesterone receptors in the transverse carpal ligament is found more in CTS patients than in non-CTS patients. In this study it was stated that the hormone estrogen can change the structure and composition of ligaments so that injuries occur more easily. This suggests that estrogen and progesterone receptors have a role in the occurrence of CTS in pregnant women and menopausal women [10]. Other risk factors that cause CTS during pregnancy are gestational hypertension with preeclampsia, diabetes mellitus, hypothyroidism, nerve hypersensitivity, sleeping position, relaxin hormone, increase in fatty tissue during pregnancy, and changes in uterine size [11, 12, 13, 14].

## Conclusion

Risk factors that can cause carpal tunnel syndrome in pregnant women are edema or water retention, hormonal changes, gestational hypertension with preeclampsia, diabetes mellitus, hypothyroidism, nerve hypersensitivity, sleeping position, relaxin hormone, increase in fatty tissue during pregnancy, and changes in uterine size.

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