

Prevalence of Carpal Tunnel Syndrome in Pregnant Women

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ABSTRACT

Carpal tunnel syndrome (CTS) is a frequent complication of pregnancy, with a prevalence reported as high as 62%. The most typical symptoms are numbness and tingling in the thumb, index finger, middle finger, and radial half of the ring finger. Other common manifestations include burning dysesthetic wrist pain, as well as the loss of grip strength and dexterity. Proximal radiation along the volar forearm, medial arm, and shoulder, while not as common, is not unusual. Symptoms are often worse at night and can be exacerbated by forceful activity and extreme wrist positions. It can be diagnosed to a high degree of specificity via history and physical examination. Median nerve function is impaired in virtually all pregnant women during the third trimester, even in the absence of symptoms. Treatment is symptomatic and usually consists of activity modification, splinting, edema control, and, if necessary, steroid injections. While most women experience symptomatic improvement following delivery, a significant percentage may still have some complaints up to at least 3 years post-partum and continue to wear splints. A high level of vigilance should be maintained in the management of these patients.

INTRODUCTION

Carpal tunnel syndrome (CTS) is a frequent complication of pregnancy. The true prevalence is unknown, but has been reported to be as high as 62%.¹⁻⁶ CTS commonly presents during the third trimester, but can occur during the first trimester. It is the most common compression neuropathy of the upper extremity. The most

typical symptoms are numbness and tingling in the thumb, index, middle, and radial half of the ring finger. Other common manifestations include burning dysesthetic wrist pain as well as the loss of grip strength and dexterity. Proximal radiation along the volar forearm, medial arm and shoulder, while not as common, is not unusual. Symptoms are often worse at night and can be exacerbated by forceful activity and extreme wrist positions.

There are numerous causative factors. Any condition that causes increased pressure within the carpal canal or depresses nerve function can cause carpal tunnel syndrome. Common conditions associated with carpal tunnel syndrome include alcoholism, diabetes mellitus, hypothyroidism, post-traumatic deformity, pregnancy, and rheumatoid arthritis. In pregnancy, the likely causes are hormonal changes and edema. Gestational diabetes can also play a role due to generalized slowing of nerve conduction.

METHODS

A search of the PubMed database from 1957 to 2008 for the topics carpal tunnel syndrome, median neuropathy, and pregnancy yielded 116 papers. Several additional landmark papers regarding the topic of carpal tunnel diagnosis and treatment were also selected for review. A review of the abstracts and available papers, as well as the references of those papers, resulted in a focus on 18 manuscripts on the topic.

Diagnosis

There are several easily performed tests that, when performed in conjunction with each other, can have a high level of specificity. The most specific test is the carpal tunnel compression test (Figure 1).⁷ The examiner applies direct thumb pressure over the median nerve at the carpal tunnel; a positive test consists of paresthesias elicited within 30 seconds. A positive Phalen's test consists of paresthesias elicited within 60 seconds of passive wrist flexion (Figure 2).⁸ In this test, it is important to

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not simultaneously flex the elbow. The Tinel test involves direct percussion of the median nerve at the carpal tunnel; reproduction of paresthesias is considered a positive result. Nerve conduction and electromyographic testing are the diagnostic gold standard, although if carpal tunnel compression, Phalen's, and Tinel tests are all positive, there is a specificity of >98%, and it is usually unnecessary to order electrodiagnostic studies prior to referral.⁹

Typical early electrodiagnostic findings include increased median nerve sensory and motor latencies. Diminished amplitude is a later finding and can be indicative of axonal damage.¹⁰

Prevalence

Existing data reports a prevalence rate of carpal tunnel syndrome during pregnancy as high as 62%.¹⁻⁶ Most of these data are based on clinical symptoms. A recent prospective clinical trial assessed electrophysiologic changes in median nerve function during pregnancy. Women in their third trimester were paired with age- and sex-matched non-pregnant controls. All sensory nerve conduction parameters (latency, amplitude, and velocity) of the median nerve were prolonged in the pregnancy compared to controls. Only 11% fit the diagnostic criteria for CTS.¹¹ These changes have been supported by Tupkovic et al in an evaluation of pregnant women in their third trimester pairing them with age- and sex-matched controls.¹² They also noted a high incidence of electrophysiologic changes in median nerve function compared to controls.¹² Thus, while not all pregnant women exhibit symptoms, most, if not all, exhibit impaired median nerve function.

Treatment

Early treatment consists of activity modification and splinting the wrist in a neutral position. Activity modification consists of avoidance of both positions of extreme flexion or extension and as well as prolonged exposure to vibration. Examples of vibration exposure include driving, lawn mowing, and use of power tools. Splinting the wrist in a neutral position maximizes carpal canal volume and decreases pressure on the median nerve. Splints are usually only necessary at night but can be worn during the day as needed.¹³

Systemic treatment directed at edema reduction can also be effective, if not otherwise contraindicated. Steroid injection offers temporary relief in 80% of patients. In diabetic patients, steroid injection can cause transient serum glucose elevation for up to 5 days. Symptoms usually resolve following birth.¹⁴ Surgery is very rarely indicated for carpal tunnel syndrome of pregnancy.¹⁵⁻¹⁶



Figure 1. A demonstration of the carpal tunnel compression test. The examiner applies manual pressure with thumbs over patient's carpal tunnel.



Figure 2. A demonstration of Phalen's test. The examiner passively flexes the patient's wrist while maintaining the elbow in an extended position.

Follow-up

Most reports in the literature regarding post-pregnancy follow-up note disappearance of symptoms post-partum. Following delivery, pain scores diminish by half during each of the first 2 weeks. This reduction has a correlation with weight loss.¹⁷

However, a recent report including 1- and 3-year postpartum follow-up noted that at 1 year, despite symptomatic and electrodiagnostic improvement, 84% of patients still had diminished median distal sensory conduction velocities. At 3 years, 49% of patients complained of symptoms and 11% still wore a splint.¹⁸

CONCLUSION

CTS is a very common disorder of pregnancy. Historically, it has been considered to be a relatively benign condition. Recent evidence points to both a higher prevalence of symptoms as well as electrophysiologic nerve changes that occur even in asymptomatic

women. While most women experience symptomatic improvement following delivery, a significant percentage may still have some complaints and continue to wear splints. A high level of vigilance should be maintained in the management of these patients.

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Overview of Carpal Tunnel Syndrome

Carpal Tunnel Symptoms and Signs

Numbness and tingling in the thumb, index finger, middle finger, and radial half of the ring finger
 Burning dysesthetic wrist pain
 Loss of grip strength and dexterity

Diagnostic Methods

Carpal tunnel compression test
 Phalen's test
 Tinel test
 Nerve conduction testing and/or electromyography

Treatment

Activity modification
 Splinting
 Steroid injection
 Surgery

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