Rani početak sindroma karpalnog tunela u trudnoći: Prikaz slučaja

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Source / Izvornik: **Acta clinica Croatica, 2010, 49, 80 - 80**

Journal article, Published version
Rad u časopisu, Objavljena verzija rada (izdavačev PDF)

Permanent link / Trajna poveznica: https://urn.nsk.hr/urn:nbn:hr:184:112058

EARLY ONSET OF CARPAL TUNNEL SYNDROME DURING PREGNANCY: CASE REPORT

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SUMMARY – Carpal tunnel syndrome is common during pregnancy and is considered to have a short and benign course. Carpal tunnel syndrome occurs most frequently in third trimester. Patients are usually managed conservatively; symptoms improve after delivery and do not require surgical intervention. We report an interesting case of pregnancy-associated carpal tunnel syndrome in a 23-year-old woman, with detailed electrophysiological studies before and after wrist splinting.

Key words: *Carpal tunnel syndrome – etiology; Pregnancy – complications; Carpal tunnel syndrome – diagnosis; Musculoskeletal diseases – diagnosis; Case report*

Introduction

Carpal tunnel syndrome (CTS) is defined as median nerve dysfunction due to compression at the level of the carpal tunnel. Patients experience pain, numbness and motor weakness in median distribution. Most cases of CTS are idiopathic, but CTS may be associated with trauma, and with systemic diseases such as diabetes mellitus, hypertension, hypothyroidism, Raynaud's disease, rheumatoid arthritis, multiple myeloma and amyloidosis. Also, certain occupations are reported to be associated with a high risk for CTS[1,2]. CTS is common during pregnancy and is considered to have a short and benign course. It occurs most frequently in the third trimester but can develop at any time. Conservative therapies are common initial measures and very few cases require surgery. The symptoms usually disappear after delivery.

We report a case of early onset of CTS during pregnancy studied with nerve conduction studies before and after conservative therapy[1,2].

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Received January 8, 2010, accepted February 11, 2010

Case Report

A 23-year-old right-handed primigravida, 20 weeks of gestation, staff nurse by profession, presented with repeated transient episodes of blenching of the right hand for about a week. Symptoms were most prominent in the early morning. The right hand complaints became persistent in digits I–III and were exacerbated by activities including driving and lifting objects with the hand. Contralateral symptoms were first noted at 22 weeks of gestation with lesser wrist pain and distal digit I–III paresthesias that increased in severity until week 24 when she experienced bilateral persistent burning pain and numbness. She denied any previous history of diabetes mellitus, thyroid disorders, rheumatoid arthritis or osteoarthritis of upper extremities. She did not sustain any trauma to the upper extremities or neck in the past. There was no history of any actions with repetitive use or abnormal and prolonged abnormal positioning of the hands. She was not taking any medications prior to these episodes. She did not complain of any weakness in the hands, neck pain or radicular pain. Both the brachial and radial pulses were equally palpable. Motor and sensory examination of both upper limbs did not reveal any abnormality. Tinel's sign was absent bilaterally while mildly positive Phalen's test was noted over the right hand. The

rest of neurologic examination was unremarkable.

Conservative therapies including neutral-angle wrist splinting and salt reduction were initiated at 24 weeks. Bilateral splints were applied throughout the day and night for 3 weeks and then nocturnally for the remainder of pregnancy. Clinical symptoms began to improve 2 weeks following initial therapy. Pain and paresthesias symptomatically resolved by the end of third trimester and prior to delivery. Postpartum, no symptoms were noted, even nocturnally or with prior exacerbating activities.

Electrophysiologic studies

Electrophysiologic studies were performed 3 times: I at 24 weeks of gestation (4 weeks after symptom onset); II at 38 weeks of gestation; and III at 2 months postpartum (Tables 1 and 2). A diagnosis of CTS was analyzed using motor conduction parameters including distal latency (DML) and amplitude of the compound muscle action potential (CMAP). For examination, bipolar stimulation electrodes were placed on the standard position. A coaxial needle electrode was used to measure MEP in the short extensor muscles of both hands. Also, motor velocity of median nerve was analyzed. Orthodromic sensory nerve action potentials (SNAP) were recorded from digit II, and SNAP amplitude and conduction velocity (CV) were determined. Care was taken to use the same distances and electrode placements for each study.

Table 1. Electrophysiological findings in motor nerves

Right	Visit I	Visit II	Visit III
Median DML	4.5	4.6	3.9
Median CMAP amplitude	5.5	5.5	5.2
Median NCV	50.0	50.0	50.0
Left			
Median DML	4.2	4.2	3.8
Median CMAP amplitude	6.5	6.5	6.1
Median NCV	54.0	54.0	54.0

DML = distal latency (in m/sn); CMAP = compound muscle action potential (in mV); NCV = nerve conduction velocity (in m/sn)

Discussion

Carpal tunnel syndrome is a compression neuropathy that occurs when the median nerve is compressed in the region where it crosses the wrist. The symptoms are numbness, tingling, and weakness in a median distribution. The diagnosis of CTS is made from patient history, physical examination findings, and electrodiagnostic studies. The reference standard for the diagnosis of CTS is electrophysiological testing, and it is necessary to be done in every patient with clinical suspicion of CTS. Sensory nerve conduction velocity of median nerve is the most sensitive electro-neurodiagnostic test. It is latent in 70%-90% of patients[3].

The occurrence of CTS during pregnancy has been reported by many authors and CTS is known to be the most common compression neuropathy that complicates pregnancy, with the incidence ranging from 2% to 35%[4]. CTS that develops in pregnancy appears to be a separate clinical entity to that developing in non pregnant women. The precise causative factors relating CTS to pregnancy are still unknown. Hormonal fluctuations in pregnant women play a role in CTS. Such fluctuations may cause fluid retention and other changes in the body that cause swelling and nerve compression in the carpal tunnel. Fluid retention is one reason for which CTS may develop in pregnancy. Some investigators speculate that weight gain increases the risk of CTS in pregnancy, but a more generally recognized cause is generalized edema causing local swelling[2-4]. Other mechanisms have been proposed.

Table 2. Electrophysiological findings in sensory nerves

Right	Visit I	Visit II	Visit III
Median SNCV – second digit	40.1	39.0	50.0
Median SNAP amplitude – second digit	18.0	17.0	18.0
Left			
Median SNCV – second digit	47.0	47.0	51.0
Median SNAP amplitude – second digit	20.0	20.0	18.0

SNAP = sensory nerve action potential (in microV); SNCV = sensory nerve conduction velocity (in m/sn)

Treatment of CTS depends on the severity of symptoms. It is often based on conservative treatment, including physical therapy, wrist splints and nonsteroidal anti-inflammatory agents. Conservative treatment was sufficient for symptom relief in our case, which is in accordance with other reports of complete improvement achieved by conservative therapy. Only a few cases have been described where operation was needed to abolish pain and to avoid disturbances of hand function[5].

Some authors report that CTS symptoms are most prominent during the day, in contrast to others reporting on a predominance of nocturnal symptoms[6]. In our case, the symptoms were most pronounced in the early morning. Data from our case report are in agreement with the authors reporting that CTS is often bilateral and more severe in the dominant hand[6,7].

Many studies have been performed to investigate CTS, however, most of the published reports are based on subjective patient assessment, clinical evaluation or retrospective chart reviews. There are limited data showing electrophysiological changes during pregnancy induced CTS[8]. Melvin *et al.*[9] were the first to analyze median nerve conduction by EMG in pregnancy and found a 7% incidence of CTS in pregnancy. Another study using only distal latency as an indicator of nerve conduction reports on the conduction velocities of both median and ulnar nerves to be affected by pregnancy; however, only 72% of the sample of pregnant women were symptomatic[10].

CTS occurs most frequently in third trimester, but can develop at any time in pregnancy. In a study of 76 women, Padua *et al.* found 62% of women in third trimester to have a clinical diagnosis of CTS, but only 43% had a positive electrophysiological diagnosis[8]. According to the literature, CTS is more common in nulliparae and in women older than 30 with pregnancy complicated by edema[4,8]. Interestingly, in our case pregnancy induced CTS occurred in a young woman aged 23.

Our finding of spontaneous resolution of CTS symptoms after delivery is inconsistent with the results reported by Turgut *et al.*[11]. In contrast, a multicenter study by Pazzaglia *et al.* found the CTS symptoms to disappear one year after delivery in only half of the women[12]. According to Mondelli *et al.*, pregnancy related CTS has a benign course and improvement of symptoms was evident at 1- and 3-year follow up, but distal sensory conduction velocity of the median nerve remained delayed in 84% of women one year after delivery despite symptom improvement[13].

CTS should be suspected in pregnant women with paresthesias in hands and complete diagnostic evaluation including electrophysiological testing has to be performed to avoid permanent damage to the median nerve.

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Sažetak

RANI POČETAK SINDROMA KARPALNOG TUNELA U TRUDNOĆI: PRIKAZ SLUČAJA

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Sindrom karpalnog tunela često se javlja za vrijeme trudnoće i najčešće ima kratak i benigni tijek. Obično se javlja u trećem tromjesečju trudnoće. Bolesnice se liječe konzervativno i simptomi se povuku nakon poroda te ne zahtijevaju kirurško liječenje. Prikazuje se zanimljiv slučaj sindroma karpalnog tunela koji se javio u dvadesettrogodišnje žene, potkrijepljen detaljnim opisom elektromiografske analize prije i poslije nošenja ortoze za ručni zglob.

Ključne riječi: *Sindrom karpalnog tunela – etiologija; Trudnoća – komplikacije; Sindrom karpalnog tunela – dijagnostika; Mišićnokoštane bolesti – dijagnostika; Prikaz slučaja*