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A short review on carpel tunnel syndrome

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ABSTRACT

Carpal tunnel syndrome is one of the most common peripheral neuropathies. It affects mainly middle aged women. In the majority of patients the exact cause and pathogenesis of CTS is unclear. Although several occupations have been linked to increased incidence and prevalence of CTS the evidence is not clear. Occupational CTS is uncommon and it is essential to exclude all other causes particularly the intrinsic factors such as obesity before attributing it to occupation. The risk of CTS is high in occupations involving exposure to high pressure, high force, repetitive work, and vibrating tools. The classic symptoms of CTS include nocturnal pain associated with tingling and numbness in the distribution of median nerve in the hand.

Keywords: CNS, Peripheral, syndrome, Vitamin B, Corticosteroid technique.

INTRODUCTION

Carpal tunnel syndrome (CTS) is a median entrapment neuropathy that causes paresthesia, pain, numbness, and other symptoms in the distribution of the median nerve due to its compression at the wrist in the carpal tunnel. The mechanism is not completely understood but can be considered compression of the median nerve traveling through the carpal tunnel. It appears to be caused by a combination of genetic and environmental factors. Some of the predisposing factors includes: diabetes, obesity, pregnancy, hypothyroidism, and heavy manual work or work with vibrating tools. There is, however, little clinical data to prove that lighter, repetitive tasks can cause carpal tunnel syndrome. Other disorders such as bursitis and tendinitis have been associated with repeated motions performed in the course of normal work or other activities. The main symptom of CTS is intermittent numbness of the thumb, index, long and radial half of the ring finger. The numbness often occurs at night, with the hypothesis that the wrists are held flexed during sleep. Recent literature suggests that sleep positioning, such as sleeping on one's side, might be an associated factor. It can be relieved by wearing a wrist splint that prevents flexion. Pain in carpal tunnel syndrome is primarily numbness that is so intense that it wakes one from sleep. Conservative treatments include use of night splints and corticosteroid injection. The only scientifically established disease modifying treatment is surgery to cut the transverse carpal ligament [1].

CAUSES

This syndrome is often a consequence of injury to the wrist and conditions that put pressure on the median nerve at the wrist like rheumatoid arthritis, diabetes, osteoporosis, hypothyroidism, obesity, and even pregnancy.

SYMPTOM

Carpal tunnel syndrome usually starts gradually with numbness or tingling in your thumb, index and middle fingers that comes and goes. This may be associated with discomfort in your wrist and hand. Common carpal tunnel syndrome symptoms include.

Tingling or numbness

You may experience tingling and numbness in your fingers or hand, especially your thumb and index, middle or ring fingers, but not your little finger. This sensation often occurs while holding a steering wheel, phone or newspaper or, commonly, waking you from sleeping. The sensation may extend from your wrist up your arm. Many people "shake out" their hands to try to relieve their symptoms. As the disorder progresses, the numb feeling may become constant.

Weakness

You may experience weakness in your hand and a tendency to

drop objects. This may be due to the numbness in your hand or weakness of the thumb's pinching muscles, which are controlled by the median nerve.

PATHOPHYSIOLOGY

The carpal tunnel is an anatomical compartment located at the base of the palm. Nine flexor tendons and the median nerve pass through the carpal tunnel that is surrounded on three sides by the carpal bones that form an arch. The median nerve provides feeling or sensation to the thumb, index finger, long finger, and half of the ring finger. At the level of the wrist, the median nerve supplies the muscles at the base of the thumb that allow it to abduct, or move away from the fingers, out of the plane of the palm. The carpal tunnel is located at the middle third of the base of the palm, bounded by the bony prominence of the scaphoid tubercle and trapezium at the base of the thumb, and the hamate hook that can be palpated along the axis of the ring finger. The proximal boundary is the distal wrist skin crease, and the distal boundary is approximated by a line known as Kaplan's cardinal line. This line uses surface landmarks, and is drawn between the apex of the skin fold between the thumb and index finger to the palpated hamates' hook. The median nerve can be compressed by a decrease in the size of the canal, an increase in the size of the contents (such as the swelling of lubrication tissue around the flexor tendons), or both. Simply flexing the wrist to 90 degrees will decrease the size of the canal. Compression of the median nerve as it runs deep to the transverse carpal ligament (TCL) causes atrophy of the eminence, weakness of the flexor pollicisbrevis, opponenspollicis, abductor pollicisbrevis, as well as sensory loss in the digits supplied by the median nerve (8). The superficial sensory branch of the median nerve, which provides sensation to the base of the palm, branches proximal to the TCL and travels superficial to it [2].

TREATMENT

When a patient is diagnosed, the treatment options are many. Combined with lifestyle changes the condition can be treated appropriately. Some of the options a patient has are.

Splints

Braces and splints are advised, especially at night, to support the wrist**.**

Physiotherapy and exercises

Once diagnosed the patient will be taught to do exercises to tone the muscles of the upper limb, along with specific exercises to treat CTS that can reduce the severity of the symptoms, especially in the early stage. Exercises aim to stretch the carpal tunnel, and hopefully create some space for the affected nerve [3].

Steroid injections

These injections help temporarily, by reducing the inflammation, and therefore the symptoms. That being said, they cannot be considered appropriate as a permanent or long-term therapy.

Nonsurgical therapy

If the condition is diagnosed early, nonsurgical methods may help improve carpal tunnel syndrome. Methods may include:

Wrist splinting. A splint that holds your wrist still while you sleep can help relieve night time symptoms of tingling and numbness. Nocturnal splinting may be a good option if you're pregnant and have carpal tunnel syndrome.

Non-steroidal anti-inflammatory drugs NSAIDs such as ibuprofen (Advil, Motrin IB, others) may help relieve pain from carpal tunnel syndrome in the short term.

Corticosteroids. Your doctor may inject your carpal tunnel with a corticosteroid such as cortisone to relieve your pain. Corticosteroids decrease inflammation and swelling, which relieves pressure on the median nerve. Oral corticosteroids aren't considered as effective as corticosteroid injections for treating carpal tunnel syndrome [4].

Surgery

If your symptoms are severe or persist after trying nonsurgical therapy, surgery may be the most appropriate option. The goal of carpal tunnel surgery is to relieve pressure on your median nerve by cutting the ligament pressing on the nerve. The surgery may be performed with two different techniques. Discuss the risks and benefits of each technique with your surgeon before surgery. Surgery risks may include incomplete release of the ligament, wound infections, scar formation, and nerve or vascular injuries. The final results of endoscopic and open surgery are similar.

Endoscopic surgery**.** In endoscopic surgery, your surgeon uses a telescope- like device with a tiny camera attached to it (endoscope) to see inside your carpal tunnel and cut the ligament through one or two small incisions in your hand or wrist. Endoscopic surgery may result in less pain than does open surgery in the first few days or weeks after surgery.

Open surgery**.** In open surgery, your surgeon makes a larger incision in the palm of your hand over the carpal tunnel and cuts through the ligament to free the nerve. This procedure may also be conducted using a smaller incision, which may reduce the risk of complications [5].

Suggested healthy habits such as avoiding repetitive stress, work modification through use of ergonomic equipment (wrist rest, mouse pad), taking proper breaks, using keyboard alternatives (digital pen, voice recognition, and dictation), and employing early treatments such as taking turmeric (anti-inflammatory), omega-3 fatty acids, and B vitamins have been proposed as methods to help prevent carpal tunnel syndrome. The potential role of B-vitamins in preventing or treating carpal tunnel syndrome has not been proven. There is little or no data to support the concept that activity adjustment prevents carpal tunnel syndrome. Stretches and isometric exercises will aid in prevention for persons at risk. An example for an isometric exercise of the wrist is done by clinching the first tightly,

releasing and fanning out fingers. None of these stretches or exercises should cause pain or discomfort. Biological factors such as genetic predisposition and anthropometrics had significantly stronger causal association with carpal tunnel syndrome than occupational/environmental factors such as repetitive hand use and stressful manual work. This suggests that carpal tunnel syndrome might not be preventable simply by avoiding certain activities or types of work/activities [6, 7].

CONCLUSION

The risk factors for developing CTS are often debated; however, the condition is very painful for those patients afflicted by it. Because it is one of the major conditions that affect workers today, pharmacists are likely to encounter patients with CTS. Based on the studies available, it appears that NSAIDS, diuretics, and oral steroids may work for a subset of patients with mild-to- moderate symptoms. Injectable corticosteroids appear to have the most beneficial outcomes in improving patient symptoms associated with CTS; however, the effects are often short-lived and rarely curative. Based on the limited studies with pyridoxine and the potential for toxicity, it is best to avoid this therapy in patients. In patients who fail to respond to oral therapy or wrist splinting, surgery is likely to result in a cure of the condition; however, surgery is not without risks and at times may fail to produce the desired outcome of a cure.

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