



Diabetic Neuropathy

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ABSTRACT

Diabetes is a chronic metabolic disorder characterized by persistent hyperglycaemia. The prevalence of diabetes is increasing in epidemic proportions worldwide.

Diabetic neuropathy is a common clinical complication of Diabetes mellitus, as almost all of diabetic patients will have some form of nerve damage. Majority are asymptomatic, while others show symptoms (depending on the nerve(s) affected) ranging from paraesthesia, numbness to major and fatal neuropathies.

Autonomic neuropathies can be prevented by adequate glycaemic control in diabetics. They can be properly managed and their progression considerably slowed down. The type of management instituted will depend on the form of neuropathy.

INTRODUCTION

Diabetic neuropathy is a common complication of Diabetes mellitus. It is the clinical manifestation of nerve damage as a result of the persistent hyperglycaemia or following mechanical injuries, seen in diabetic patients

The clinical manifestations of diabetic neuropathies are varied and they depend on the type and location of the nerves affected. It can affect sensory, motor and/or autonomic nerves in the body

Diabetic neuropathy occurs in about half of diabetic patients after about 10 years from the onset of diabetes¹. In patients with juvenile DM, diabetic neuropathy is commonly seen between the ages of 30- 40 years, while in those with adult- onset DM, it is seen between 40- 50 years of age²

The prevalence of diabetic neuropathy is related to the duration of diabetes and the degree of metabolic control³

AETIOLOGY

Several theories have been put forward about how diabetes can result in nerve damage. Nerve damage is likely due to a combination of the following factors⁴:

- Ø Metabolic factors such as high blood glucose, low level of insulin, abnormalities in fat metabolism
- Ø Neurovascular factors leading to damage of blood vessels that carry oxygen and nutrients to the nerves
- Ø Inflammation in the nerves due to autoimmune factors
- Ø Mechanical injury to nerves such as carpal tunnel syndrome, trauma
- Ø Lifestyle factors such as smoking, alcohol

Clinical features of diabetic neuropathy

The clinical manifestation of diabetic neuropathy is varied and it depends on the nerve(s) affected. Majority of patients with diabetic neuropathy do not show any symptoms⁵, while others can present with mild symptoms such as paraesthesia, tingling sensation, or hypoaesthesia

The sensory, motor or autonomic nerves of the body can be affected

either singly or in various combinations, producing the features seen in diabetic neuropathy

The clinical features are thus discussed under the following subheadings:

Ø Sensory polyneuropathy:

This type of neuropathy is asymptomatic in most cases. It usually affects both sides of the body (symmetrical). The common manifestations of this kind of neuropathy include⁶:

- Paraesthesia in the feet
- Pain in the lower limb
- Burning sensation in the soles of the feet
- Cutaneous hyperaesthesia
- Muscle weakness, abnormal gait and numbness in the feet
- Foot ulceration

Ø Diabetic amyotrophy

This results from the affection of motor nerves in the body. It is characterized by severe and progressive weakness and wasting of the proximal muscles of the lower (and sometimes the upper) limbs.⁷ it is usually accompanied by hyperaesthesia, paraesthesia in the anterior aspect of the leg and can even lead to significant weight loss in these patients (neurotropic cachexia).

Ø Mononeuropathy

Affection of single nerves, either peripheral or cranial nerves can also occur in Diabetes mellitus. Mononeuropathies are usually of rapid onset and are severe, but, recovery is very common. The nerves most commonly affected are the 3rd and 6th cranial nerves, femoral and sciatic nerves⁸. The median nerve can also be affected, giving a clinical picture of carpal tunnel syndrome.

Ø Autonomic neuropathy

Autonomic neuropathy affects the nerves that control the heart, regulate blood pressure, and control blood glucose levels and also

internal organs; resulting in problems with digestion, respiratory function, urination, sexual response and vision⁹

The clinical manifestation of this neuropathy likewise depends on the system affected¹⁰:

- Heart and blood vessels: Damage to nerves in the cardiovascular system interferes with the body's ability to adjust blood pressure and heart rate. There can be postural hypotension, resting tachycardia.

- Digestive system: The commonest symptom here is constipation. There is general decrease in the gastrointestinal motility leading to delayed gastric emptying, hence, nausea and vomiting, abdominal fullness are commonly seen

- Genitourinary system: Affection of the nerves that control micturition can lead to atonic bladder, as a result, incomplete bladder emptying with bacterial colonization and recurrent urinary tract infections.

There is also affection of the sexual response as can result in erectile dysfunction and retrograde ejaculation

- Sudomotor system: There is inability of the body to regulate its temperature. There can be nocturnal sweats, gustatory sweating

- Eyes: Autonomic neuropathy affects the pupils of the eyes and makes them less responsive to light.

MANAGEMENT OF DIABETIC NEUROPATHY

The first step in the management of Diabetic neuropathy, like other complications of Diabetes, is to ensure good glycaemic control. This will help to lessen the symptoms and also prevent further damage to the nerve tissues¹¹. Additional treatment will depend on the type of nerve damage:

Pain and paraesthesia: These are the most common symptoms of peripheral somatic neuropathy. They can be very discomforting to the patient. There are several drugs and combinations of drugs available to treat severe pain¹²:

- Anticonvulsants- Gabapentin, carbamazepine, pregabalin, phenytoin
- Tricyclic antidepressants- Amitriptyline, imipramine
- Substance P deplete- capsaicin
- Opiates- Oxycodone

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- Antioxidants- a- lipoic acid

- Membrane stabilizers- Mexiletine, intravenous lidocaine

Gastroparesis: In mild cases, this can be managed by eating small, frequent meals; avoiding fats. However, in severe cases, drugs are given to increase the gastrointestinal motility and reduce nausea. Drugs such as dopamine antagonists (metoclopramide, domperidone), erythromycin

Atonic bladder: Intermittent self- catheterization is done for this condition. Antibiotics can be prescribed for the urinary tract infection

Erectile dysfunction: This is a very important symptom as it is a great source of worry to the patient. It is estimated that about 30% of diabetic males have erectile dysfunction and the cause is multifactorial¹³. The various modalities for management of erectile dysfunction include:

- Phosphodiesterase type 5 inhibitor- sildenafil, vardenafil, tadalafil
- Dopamine agonist
- Prostaglandin E1
- Vacuum tumescence devices
- Psychosexual therapy

Excessive sweating can be managed with topical anticholinergic drugs (propranolol, poldine), clonidine, and topical antimuscarinic agent (glycopyrrolate cream)

Foot care: The nerves to the feet are the ones most often affected by neuropathy, therefore, careful attention should be paid to the care of the feet as sores and injuries will be often unnoticed and can become infected or ulcerated. The care of the feet include, cleaning the feet daily with warm water; inspecting the feet daily for cuts, blisters, swelling; using lotion to moisturize the skin; wearing protective foot wears always.

CONCLUSION

The clinical manifestations of Diabetic neuropathy can range from being asymptomatic to being life threatening to the patient. Signs of neuropathy should be looked for in all diabetic patient as it is a very common complication of diabetes, and adequate glycaemic control might be all that is needed to prevent or manage these neuropathies

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