Tuijin Jishu/Journal of Propulsion Technology
ISSN: 1001-4055
Vol. 44 No. 4 (2023)

Literature Reviews of Diabetic Neuropathy Due to Type 2 Diabetes Mellitus

Dr. Sonali R. Patil[1], Dr.Abhinandan Muke[2], Dr. Dhananjay M Patil[3], Dr. Lata D. Patil[4]

[1]PhD (Scholar) Department of Rognidan evam Vikriti vigyan, BVDU College of Ayurved, Pune, India.
[2]Professor, Department of Rognidan evam Vikriti vigyan, BVDU College of Ayurved, Pune, India.
[3]Assistant professor, Department of Swasthavritta, BVDU College of Ayurved, Pune, India.
[4]Associate Professor, Department of Rognidan evam Vikriti vigyan, BVDU College of Ayurved, Pune, India.

Abstract: Diabetes mellitus is the most common problem in routine practice. It is lifestyle induced disorder. In day to day lifestyle induced diseases are increase due to faulty lifestyle. In all type of Diabetes the main symptom is hyperglycemia. In this chapter we are going to study various aspects of type 2 Diabetes and complication occurred due to Diabetes mellitus that is Diabetic neuropathy. When We think about of Diabetes mellitus then points comes under that from sign, symptoms, Diagnosis and treatment of Diabetes but some time person with uncontrolled Diabetes Mellitus get complication like neuropathy and after all management of complication is also important. Experience of any type of diabetes is very difficult task for every patient and doctor too, so study of diabetic neuropathy due to type 2 diabetes mellitus is necessary hence I have chosen this topic for review article.

Keywords: *Diabetes mellitus, diabetic neuropathy, Hyperglycemia,*

1. INTRODUTION

The term Diabetes mellitus contains two words that is 'Diabetes' and 'Mellitus'. In Greek language the 'Diabetes' means that 'to run through a siphon' and 'Mellitus' means honey. Diabetes is now worldwide problem.

Diabetes mellitus is a clinical syndrome mainly diagnosed by hyperglycemia due to lack of or relative deficiency of insulin. It can arise in many different way but is most commonly due to autoimmune type 1 diabetes or in adult-onset type 2 diabetes.[1] Deficiency of insulin affects the metabolism of various factors like carbohydrate, protein and fat, and it can cause a significant disturbance of electrolyte and water homeostasis.

The long-term effects of diabetes mellitus can leads to dysfunction, destruction and failure of various organs and systems[2]. The long-term effects of diabetes leads to progressive generation of retinopathy with blindness, nephropathy that may causes, neuropathy with risk of foot ulcers, renal failure and features of autonomic dysfunction, including sexual dysfunction.[3] Persons with diabetes malleus are more prone to, peripheral vascular cardiovascular attactck, and cerebrovascular attack.

Aim and objectives

1) To study the concept of type 2 diabetes mellitus and diabetic neuropathy

2) To study management of type 2 diabetes mellitus and diabetic neuropathy

2. MATERIAL-METHODE

1) For this study we referred Charaka samhita for various references of Madhumeha

2) Related modern text books also referred for modern references

Review of Literature

Types:

Classification of diabetes mellitus[4]

- Type 1 diabetes

a. Immune-mediated

b. Idiopathic

- Type 2 diabetes
- Other specific types

1. Excess endogenous production of hormonal antagonists to insulin
2. Viral infections (e.g. congenital rubella, mumps, Coxsackie virus B)
3. Uncommon forms of immune-mediated diabetes Associated with genetic syndromes (e.g. Down's syndrome, Turner's syndrome, diabetes mellitus.
4. Genetic defects of B-cell function
5. Pancreatic disease
6. Genetic defects of insulin action
7. Klinefelter's syndrome, diabetes insipidus.
8. Drug-induced (e.g. corticosteroids, thiazide diuretics, phenytoin)

- Gestational diabetes

Causes : [5]

- Lifestyle and genetic factors.
- While some of these factors are under personal control, such as diet and obesity
- Increasing age,
- Genetics.

Pathology[6]

Type 2 diabetes is a more complicated condition than type 1 diabetes because there is a combination of resistance to the actions of insulin in liver and muscle together with impaired pancreatic B-cell function leading to 'relative' insulin deficiency. The natural history including physical inactivity, generous dietary intake and degree of obesity influences the occurrence of type II Diabetes Mellitus. Insulin resistance appears to come first, and leads to elevated insulin secretion in order to maintain normal blood glucose levels. hence, in susceptible person the pancreatic B cells are unable to sustain the increased demand for insulin and a slowly progressive insulin deficiency develops

Sign and Symptoms : [7]

- Thirst, dry mouth
- Blurring of vision
- Pruritus vulvae,

- Polyuria
- Hyperphagia; predilection for sweet foods
- Mood change, irritability, difficulty in concentrating, apathy
- Nocturia
- Tiredness,
- fatigue
- Recent change in weight
- balanitis (genital candidiasis)
- Nausea; headache

Diagnosis and Investigation:[7,8.]

Diagnosis of Diabetes Mellitus is done on the basis of:

1. Symptoms of Diabetes Mellitus: e.g. Polyuria, Polydipsia, etc.

2. Blood Sugar Test :

There are two types of test – Screening tests for Diebetis Mallitus and diagnostic test. Screening tests are performed on people who have no symptoms of Diabetes.

- Fasting plasma glucose level ≥ 7.0 mmol/L (126 mg/dL). For this test, blood is taken after a period of fasting, i.e. in the morning before breakfast, after the patient had sufficient time to fast overnight.
- Random Plasma glucose ≥ 11.1 mmol/L (200 mg/dL) two hours after a 75 gram oral glucose load as in a glucose tolerance test (OGTT)
- Glycated hemoglobin (HbA1C) ≥ 48 mmol/mol (≥ 6.5 DCCT %)

c. Urine Test for Glucose :
It is most usual procedure for detecting Diabetes but most serious disadvantage in its use; arise from individual variations in renal threshold.

Treatment

- A well-balanced nutritious diet remains basic important fundamental element of therapy.
- In patient with obesity with mild hyperglycemia the major goal of diet therapy is weight reduction by caloric restriction.
- Dietary treatment of Diabetes still constitutes the basis for management, so that it is believed even today that 50% of diabetics could be put to control only by judicious dietary regimen.
- The main aims of diabetic diet are as follows : *f*
  a. Prevent excessive postprandial hyperglycemia and thus symptoms of Diabetes.
  b. Prevent hypoglycemia if the patient is on exogenous Insulin. *f*
  c. Obtain ideal body weight. *f*
  d. Prevent or delay premature atherosclerosis.
  e. Normalize serum cholesterol and triglycerides.
  f. If not in control then appropriate hypoglycemic drug should be given as follows[10]
- Thiazolidinediones
- Meglitinides and amino acid derivatives
- Sulphonylureas
- Metformin
- Acarbose
- Insulin

Diabetic Neuropathy:

Definition: [12]

Diabetic neuropathy is can be defined as the presence of clinical features of peripheral dysfunction of nerves in persons with diabetes after the exclusion of other causes.

Classification of Diabetic Neuropathies[13]

1. **Symmetrical Polyneuropathies**

- Distal sensory or sensorimotor polyneuropathy
- Large-fibre neuropathy
- Small-fibre neuropathy
- Autonomic neuropathy

2. **Asymmetrical Neuropathies**

- Cranial neuropathy (single or multiple)
- Truncal neuropathy (thoracic radiculopathy)
- Lumbosacral radiculopathy (asymmetrical proximal motor neuropathy)
- Limb mononeuropathy (single or multiple)
- Entrapment neuropathy

3. **Combinations.**

- Polyradiculoneuropathy
- Diabetic neuropathic cachexia
- Symmetrical polyneuropathies

Clinical Features[14]

1. **Symmetrical Polyneuropathies:**

Its frequently asymptomatic. Most common sign found on physical examination are diminished perception of vibration sensation distally and loss of tendon reflexes in the lower limbs

2. **Asymmetrical Neuropathies:**

a. Sometimes its known as diabetic amyotrophy,
b. this always associated with severe and progressive weakness and wasting of the proximal muscles of the lower limbs.
c. It is commonly associated with severe pain, mainly felt on the anterior aspect of the leg, paraesthesiae and hyperaesthesia.
d. Sometimes there may be associated with weight loss, patient may look as extremely ill and not to be able to get out of bed.

3. **Mononeuropathy:**

Either sensory or motor function can be affected within a cranial nerve or single peripheral

Treatment of Diabetic Neuropathy:[15]

Treatment of diabetic neuropathy is therapeutic challenge due to its pathophysiology is not yet fully known and pain relief is yet not satisfactory. Good glycemic control and The pharmacological treatments is the key of treatment of diabetic neuropathy.

Drugs from various pharmacological classes as follows,

- Anticonvulsants- Pregabalin
- Antidepressants
  Antidepressants represent the first line drugs in DNP management. Duloxetine,
- Venlafaxine
- Opioids
- Capsaicin topical cream
- Lidocaine patch
- Alpha lipoic acid
- Isosorbide dinitrate spray.

Relation of type 2 Diabetes and Diabetic Neuropathy :

This is a most common and early forming complication affecting approximately 30% of type 2 diabetic patients. In some patients it can cause severe disability, it is non-symptomatic in the many cases. As a retinopathy, it form secondary to metabolic disturbance, and prevalence is depends upon the duration of diabetes and the degree of metabolism. May be there central nervous system is affected in long-term diabetes, the clinical impact of diabetes is mostly affected on the peripheral nervous system.

2. DISCUSSION

Now days number of lifestyle induced diseases increases due to advanced lifestyle. It can be says that Diabetic is one of the lifestyle induced disease. Diabetic neuropathic is the one of early forming ans most comman complication of type 2 diabetic mellitus. By literature study it is found that diabetic neuropathic has limited treatment.

3. CONCLUSION

Due to technology and fast lifestyle there are risk of increase in lifestyle induced disorder so diseases like type 2 diabetic mellitus and its complication like diabetic neuropathic can be treated by good glycemic control and pharmacological treatments is the key of treatment of type 2 diabetic mellitus and diabetic neuropathy.

References

[1] Davisons Principal and practice of medicine, by sie Stanley Davidson, 20th
[2] edition, page no. 808.
[3] API Textbook of Medicine by Yash Pal Munjal, Vol 1, 9th edition, page no. 321.
[4] API Textbook of Medicine by Yash Pal Munjal, Vol 1, 9th edition, page no. 321.
[5] Davisons Principal and practice of medicine, by sie Stanley Davidson, 20th edition, page no. 810.
[6] https://en.wikipedia.org/wiki/Type_2_diabetes#Causes
[7] Davisons Principal and practice of medicine, by sie Stanley Davidson, 20th edition, page no. 813.
[8] Davisons Principal and practice of medicine, by sie Stanley Davidson, 20th edition, page no. 818.
[9] https://en.wikipedia.org/wiki/Diabetes#Diagnosis
[10] Davisons Principal and practice of medicine, by sie Stanley Davidson, 20th edition, page no. 817.
[11] Davisons Principal and practice of medicine, by sie Stanley Davidson, 20th edition, page no. 832.
[12] API Textbook of Medicine by Yash Pal Munjal, Vol 1, 9th edition, page no. 382

[13] API Textbook of Medicine by Yash Pal Munjal, Vol 1, 9th edition, page no. 382
[14] Davisons Principal and practice of medicine, by sie Stanley Davidson, 20th edition, page no. 843
[15] https://pubmed.ncbi.nlm.nih.gov/25897354