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HOME REMEDIES FOR DIABETES MELLITUS –A REVIEW

K.Harikumar*, Sahil Ansari, Bharat Raj Joshi, K.Rekha, Arjun Kumar Ray, G. Hima Bindu

Department of Pharmacology, Sri Venkateswara College of Pharmacy, R.V.S.Nagar, Chittoor-517127, Andhra Pradesh, India.

ABSTRACT

Diabetes mellitus is well thought-out to be a metabolic disorder ensuing from a defect in insulin secretion, insulin action, or both. Insulin deficiency leads to route for chronic hyperglycaemia with disturbances of carbohydrate, fat and protein metabolism. It is a general endocrine disorder and by the year 2015, it is estimated that more than 200 million people worldwide will have DM and 350 million will subsequently have the disease by 2025. As the disease progresses tissue or vascular damage takes place and leads to most important sever diabetic complications like retinopathy, neuropathy, nephropathy, cardiovascular complications and diabetic foot ulcer (gangrene). Thus, diabetes is one of the wide range complicated diseases in the present world. Diabetes mellitus is basically classified into several types but the two main types are Type 1 and Type 2. Drugs are used for diabetic complications and, by eliminating various risk factors, to increase longevity. Insulin and Oral hypoglycaemic agents are also useful in the treatment of Type 1 & Type 2 Diabetes mellitus. Oral hypoglycaemic agents include sulphonylureas, biguanides, alpha glucosidase inhibitors, meglitinide analogues, and thiazolidenediones. The main motto of these drugs is to correct the underlying metabolic disorder, such as insulin resistance and inadequate insulin secretion. But they are having so many side effects, to overcome these adverse reactions using home remedies along with diet and exercises is having importance for the treatment of diabetes.

Key Words: Diabetes Mellitus, Insulin, Sulphonylureas, Biguanides, Alpha Glucosidase Inhibitors, Meglitinide Analogues, Thiazolidenediones.

INTRODUCTION

Diabetes mellitus is a severe complex chronic condition that is a major source of ill health worldwide. This metabolic disorder is described by hyperglycemia and disturbances of carbohydrate, protein, and fat metabolisms, secondary to an absolute or relative not have of the hormone insulin [1]. Besides hyperglycemia, several other factors including dislipidemia or hyperlipidemia are involved in the development of micro and macrovascular complications of diabetes that are the major causes of morbidity and death. According to WHO projections, the prevalence of diabetes is likely to increase by 35%. Currently, there are over 200 million diabetic patients worldwide and this is likely to increase to 350 million or more by the year 2025. Reasons for this increase include increase in sedentary lifestyle, consumption of energy-rich diet, obesity, higher life span, etc. Other regions with greatest number of diabetics are Asia and Africa, where diabetes mellitus rates could rise to twofold to threefold than the present rates. Home remedies are used for diabetes mellitus is of growing concern as they contain many bioactive substances with therapeutic potential [2].

Corresponding Author

K. Harikumar
Email: harikumarpharmacology@gmail.com

CLASSIFICATION

- ❖ Type 1
- ❖ Type 2
- ❖ Gestation diabetes
- ❖ Feline diabetes – diabetes in cats

Symptoms of type 1 diabetes

1. Frequent urination
2. Unusual thirst
3. Extreme hunger
4. Unusual weight loss
5. Extreme fatigue and Irritability

Symptoms of type 2 diabetes

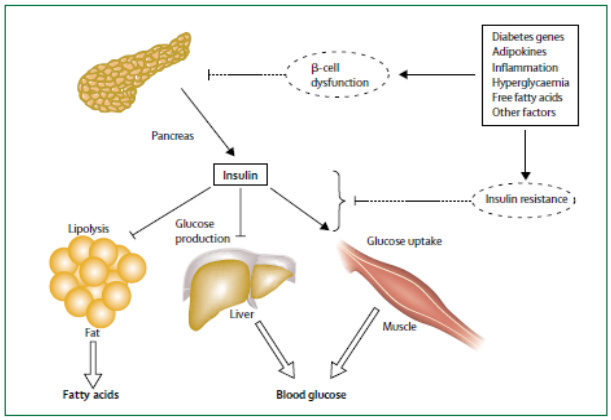
1. Excessive Urination and Thirst
2. Increased Hunger
3. Unexplained Weight Gain
4. Irritability and Fatigue
5. Blurred Vision
6. Warning Signs of Diabetes

a) Decelerated Healing

b) Skin and Yeast Infections plus Frequent Gum and Bladder Infections

Other symptoms

1. Sexual Dysfunction in Men
2. Vaginal Infections in Women
3. Numbness/Tingling in hands and feet
4. Itchy or Flaky Skin



Pathophysiology of hyperglycaemia and increased circulating fatty acids in type 2 diabetes

Insulin secretion from the pancreas normally reduces glucose output by the liver, enhances glucose uptake by skeletal muscle, and suppresses fatty acid release from fat tissue. The various factors shown that contribute to the pathogenesis of Type 2 diabetes affect both insulin secretion and insulin action. Decreased insulin secretion will reduce insulin signalling in its target tissues. Insulin resistance pathways affect the action of insulin in each of the major target tissues, leading to increased circulating fatty acids and the hyperglycaemia of diabetes. In turn, the raised concentrations of glucose and fatty acids in the bloodstream will feed back to worsen both insulin secretion and insulin resistance [3].

Obesity

Insulin resistance is strongly associated with obesity and physical inactivity, and several mechanisms mediating this interaction have been identified. A number of circulating hormones, cytokines, and metabolic fuels, such as non-esterified (free) fatty acids (NEFA) originatein the adipocyte and modulate insulin action. An increased mass of stored triglyceride, especially in visceral or deep subcutaneous adipose depots, leads to large adipocytes that are themselves resistant to the ability of insulin to suppress lipolysis. This results in increased release and circulating levels of NEFA and glycerol, both of which aggravate insulin resistance in skeletal muscle and liver (figure 3). Excessive fat storage not only in adipocytes but "Ectopically" in non-adipose cells also has an important role. For example, increased intramyocellular lipids are associated with skeletal muscle insulin resistance under some circumstances. The coupling between intrahepatic lipids and hepatic insulin resistance seems to be even tighter.

Risk factors for type 1 diabetes includes

- **Viral exposure:** Exposure to Epstein-Barr virus, coxsackie virus, mumps virus or cytomegalovirus may trigger the autoimmune destruction of the islet cells, or the virus may directly infect the islet cells.
- **Early vitamin D:** Research suggests that vitamin D may be protective against type 1 diabetes. However, early drinking of cow's milk — a common source of vitamin D — has been linked to an increased risk of type 1 diabetes.
- **Other dietary factors:** Omega-3 fatty acids may offer some protection against type 1 diabetes. Drinking water that contains nitrates may increase the risk. Consuming dairy products, particularly cow's milk, may increase infants' risk of the disease. Additionally, the timing of the introduction of cereal into a baby's diet may affect risk. One clinical trial found that between ages 3 and 7 months appears to be the optimal time for introducing cereal.

Some other possible risk factors includes

- Having a mother younger than age 25 when she gave birth to you
- Having a mother who had preeclampsia during pregnancy
- Being born with jaundice
- Having a respiratory infection just after birth

RISK FACTORS OF DIABETES TYPE 2

Researchers don't fully understand why some people develop type 2 diabetes and others don't. It's clear, however, that certain factors increase the risk, including:

- **Weight:** Being overweight is a primary risk factor for type 2 diabetes. The more fatty tissue you have, the more resistant your cells become to insulin.
- **Fat distribution:** If your body stores fat primarily in your abdomen, your risk of type 2 diabetes is greater than if your body stores fat elsewhere, such as your hips and thighs.
- **Inactivity:** The less active you are, the greater your risk of type 2 diabetes. Physical activity helps you control your weight, uses up glucose as energy and makes your cells more sensitive to insulin.
- **Family history:** The risk of Type 2 diabetes increases if your parent or sibling has type 2 diabetes.

- **Race:** Although it's unclear why, people of certain races — including blacks, Hispanics, American Indians and Asian-Americans — are more likely to develop type 2 diabetes than whites are.
- **Age:** The risk of type 2 diabetes increases as you get older, especially after age 45. That's probably because people tend to exercise less, lose muscle mass and gain weight as they age. But type 2 diabetes is also increasing dramatically among children, adolescents and younger adults.
- **Prediabetes:** Prediabetes is a condition in which your blood sugar level is higher than normal, but not high enough to be classified as diabetes. Left untreated, prediabetes often progresses to type 2 diabetes.
- **Gestational diabetes:** If you developed gestational diabetes when you were pregnant, your risk of later developing type 2 diabetes increases. If you gave birth to a baby [4].

COMPLICATIONS OF DIABETES

- Heart and blood vessel disease
- Nerve damage (Neuropathy)
- Kidney damage (Nephropathy)
- Diabetic cardiomyopathy
- Coronary artery disease
- Stroke (Mainly the ischemic type)
- Diabetic myo-necrosis (Muscle wasting)
- Diabetic encephalopathy
- Eye damage
- Foot damage (Diabetic foot)
- Skin and mouth functions
- Osteoporosis
- Pregnancy complications
- Hearing problems.

LIST OF HOME REMEDIES FOR DIABETES MELLITUS

1. **American Ginseng (Panaxquinquefolius) - ASHWAGANDA**

This is a popular chinese herb that can be effective in lowering blood sugar in type 2 diabetic patients. Lowering of blood sugar by this herb may result from direct stimulation of insulation release, tissue insulin sanitization or a combination of both.

2. **Bitter Melon (*Momordica charantia*) – BITTER GOURD**

Bitter melon has at least three compounds that can lower level of blood sugar in type 2 diabetic patients.

3. **Fenugreek (*Trigonellafoenum-graecum*) - MENTHULU**

Fenugreek seed are highly recommended for lowering blood sugar that gets elevated after meal. The seeds contain certain compounds that seem to stimulate insulin secretion.

4. **Neem (*Azadirachta indica*)**

Extract from leaves and seeds of this plant are renowned as effective cures for diabetes. Extracts from neem leaf has the potential to dilate blood vessels and improve blood circulation.

5. ***Allii sativi Bulbus*** **- GARLIC**

The bulbs of *Allium sativum* L., has a very long folk history of use in a wide range of ailments. It is also alleged to help regulate blood sugar levels. It can reduce glucose metabolism in diabetics, slows the development of arteriosclerosis and lowers the risk of further heart attacks in myocardial infarct patients

6. ***Allii cepa Bulbus*** **- ONION**

Onion feeding improved the metabolic status in diabetic conditions, probably because of hypoglycemic and hypo-cholesterolemic effect, mediated diabetic nephropathy by lowering blood cholesterol levels and decreasing lipid peroxidation. Its active principles showed that allyl propyl disulfide and S-methyl cysteine sulfoxide have an anti-diabetic and anti-hyperlipidemic effect, the latter being analogous to glibenclamide and insulin

7. ***Psidium guajava*** **(L.) - GUAVA**

The fruit contains a high percentage of vitamin C, carotene, vitamin B1, B2, B6, and pectin. The extract of the whole plant of ***P. guajava*** excluding roots was reported to be devoid of any antibacterial, antifungal, antiviral, anti-fertility, hypoglycemic, diuretic, and anti-inflammatory activities.

8. ***Nelumbon ucifera*** **(Gaertn.) - LOTUS**

Nelumbon ucifera Gaertn. is a useful medicinal culinary plant. It has been reported that rhizome extract showed anti-diabetic and anti-inflammatory effects. On the other hands; it has recently been used as plain extraction or blend tea to treat obesity in China. Alkaloids isolated from *Nelumbon ucifera*, including liensinine, daurisoline, neferine, and flavonoids are the main compounds that give medicinal effects.

9. ***Stevia rebaudina*** **(Bert.) Hemsl. – MADHU TULSI**

Plant contain stevioside sweetener that reduces postprandial blood glucose levels in T2DM patients, indicating beneficial effects on the glucose metabolism. The plant contain stevioside with the mechanism to stimulate insulin secretion via a direct action on β cells of pancreatic islet, which is considered to have the potential of becoming a new anti-diabetic drug for use in T2DM.

***10. Prunella vulgaris* (L.) – SELF HEAL**

The possible mechanism of this plant is to repair β cells of pancreatic islet to release insulin. Constituents in the *P. vulgaris* have been identified, such as, phenolic acids (rosmarinic, caffeic.), triterpenoids (methyl oleanolate, methyl ursolate, methyl maslinate),flavonoids (quercetin, campherol, rutin), tannins, and polysaccharide.

***11. Ganoderma lucidum* – BITTER MUSHROOM**

The sporophore of *Ganoderma lucidum* is used as both tonic nourishment and medicine for care of diabetic patients. Some research results showed that polysaccharides are the active principles for anti-diabetes. Ganoderans A and B have been isolated and confirmed to have a hypoglycemic activity.

***12. Punica granatum* - POMEGRANATE**

The flowers of *Punica granatum* are also used for the treatment of diabetes mellitus in India. Oral administration of the aqueous ethanolic extract of Punicagranatum flowers led to a significant blood glucose lowering effect in normal, glucose fed and alloxan-induced diabetic rats. The extract of *Punica granatum* seeds was also reported to have antidiabetic activity; ursolic acid may be the active constituent.

***13. Momordica charantia* (L.) – BITTER MELON**

*Momordica charantia **L***. is not only a nutritious vegetable, but is also used in traditional medical practices to treat T2DM. Experimental studies with animals and humans suggested that the vegetable has a possible role in glycemic control.

***14. Murraya koenigii* (L.) – KARIVEPAKU (Curry leaf)**

The findings from this study suggested that the aqueous extract of these leaves may be prescribed as adjunct to dietary therapy and drug treatment for controlling diabetes mellitus.

***15. Artocarpus heterophyllus* (Lam.) – JACK FRUIT (Panasa)**

The plant is reported to possess antibacterial, anti-inflammatory, anti-diabetic, antioxidant and immunomodulatory properties.

***16. Mangifera indica* (L.) - MANGO**

The leaves of *Mangifera indica* were proven for antidiabetic properties using normoglycemic, glucose-induced hyperglycemia and streptozotocin (STZ)-induced diabetic mice.

***17. Aegle marmelos* (L.) Corr. – BAEL (BILVAMU)**

The leaves, fruits, and stems contain skimianinc, sterol and aegelin, lupeol, marmin. In pharmacological trials, both the fruit and root showed anti-amoebic and hypoglycemic activities. *A. marmelos* would act like insulin in the restoration of blood sugar and body weight to normal levels in rat and was therefore recommended as a potential hypoglycemic agent.

***18. Curcuma longa* (L.) - TURMERIC**

Curcuma longa L., commonly known as turmeric, has been used as spice and coloring agent with long history. Its rhizomes have been reported to possess anti-diabetic properties in experimental animal models. Researches reported that active ingredient curcumin is the response for anti-diabetic action.

19. Amla or Indian gooseberry:

Packed with vitamin C, aamla is an elixir for diabetics. Having a tablespoon ofaamla juice mixed with a cup of karela juice on a regular basis can help stimulate the proper functioning of the islets of Langerhans (the group of cells responsible for the production of insulin) and keep blood sugar under control.

20. Ambul fruit or jamun:

Known as a very potent home remedy against diabetes, jamun is great for diabetics as it helps the pancreas function optimally. Apart from that, not only is the fruit useful for diabetics, but even its seeds help lower blood sugar.

21. Grapefruit:

Also known as angora in hindi, this is a fruit that looks somewhat like an orange, but has a reddish interior. Grapefruits are the perfect medicine for people with diabetes and those who have a risk of suffering from the disease.

22.Bengal gram

Also known as chickpeas, Bengal gram is great to lower glucose levels in a diabetic patient.

23. Black gram or kalachana

This is especially good in cases where a person's diabetes has not become chronic and is at the beginning stages. All you need to do is add two table spoons of germinated black gram to half a cup of freshly made karela juice. Add a spoon of honey to the mix and have this on a daily basis. Once a day should suffice.

24. Cinnamon

Cinnamon is another ingredient that is bliss for patients, suffering from diabetes mellitus. Mix 4 teaspoons of cinnamon powder with water and boil it on low flame. Consume this extract every day for controlling and maintaining healthy blood glucose levels in your body.

25. *Aloe Vera*

Aloe vera has already proved its consistency in being beneficial in a lot of body ailments as a home

remedy, and diabetes is not an exception. Take equal quantities of aloe vera juice, turmeric, and bay leaf, and mix them together. Have this mix every day before the meal as it will help in keeping the blood glucose levels in control [5-8].

CONCLUSION

All synthetic drugs like sulfonylureas and biguanides have their own adverse effects like Nausea, Vomiting, Cholestatic jaundice, Skin rashes, Anaemia, Leucopenia, Hypoglycaemia, Intolorance to alchol, GIT disturbances, Visual disturbances, Anorexia, Abdominal discomfort, Metalic taste in mouth. By using of home remedies we can reduce complications of diabetes and control blood glucose levels

REFERENCES

1. American Diabetes Association. Screening for diabetes. *Diabetes Care*, 21(suppl 1), 1998, 20-s22.
2. Expert Committee on the Diagnosis and Classification of Diabetes Mellitus. Diagnosis and Classification of Diabetes Mellitus. *Diabetes Care*, 32(suppl 1), 2009, 62-67.
3. American Diabetes Association. All about Diabetes. http://www.diabetes.org/about-diabetes.jsp (accessed 10 Feb 2009).
4. American Diabetes Association. Standards of medical care in diabetes—2007. *Diabetes Care*, 32(suppl 1), 2009, s13-61.
5. World Health Organization Study Group. Prevention of diabetes mellitus. Technical Report No. 844, Geneva, 1994.
6. The International Expert Committee. International Expert Committee report on the role of A1C Assay in the diagnosis of diabetes. *Diabetes Care*, 32, 2009, 1327-1334.
7. Fagot-Campagna A, Pettitt DJ, Engelgau MM *et al*. Type 2 diabetes among North American children and adolescents: An epidemiologic review and a public health perspective. *J Pediatr*, 136, 2000, 664-72.
8. American Diabetes Association. Standards of medical care in diabetes. *Diabetes Care*, 32(suppl 1), 2009, 15.