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A Concise review on management of Type 2 Diabetes Mellitus with Homoeopathic drugs

Una revisión concisa sobre el manejo de la diabetes mellitus tipo 2 con medicamentos homeopático

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ABSTRACT

Type 2 diabetes mellitus (DM) is a chronic metabolic disorder in which prevalence has been increasing steadily all over the world. As a result of this trend, it is fast becoming an epidemic in some countries of the world with the number of people affected expected to double in the next decade due to increase in ageing population, thereby adding to the already existing burden for healthcare providers, especially in poorly developed countries. This review is based on a search of Medline, the Cochrane Database of Systemic Reviews, and citation lists of relevant publications. Subject heading and key words used include type 2 diabetes mellitus, prevalence, current diagnosis, and current treatment. Only articles in English were included. Screening and diagnosis is still based on World Health Organization (WHO) and American Diabetes Association (ADA) criteria which include both clinical and laboratory parameters. No cure has yet been found for the disease; however, treatment modalities include lifestyle modifications, treatment of obesity, oral hypoglycemic agents, and insulin sensitizers like metformin, a biguanide that reduces insulin resistance, is still the recommended first line medication especially for obese patients.

Keywords: Type 2 diabetes mellitus, Diagnosis, Management

RESUMEN

La diabetes mellitus (DM) tipo 2 es un trastorno metabólico crónico cuya prevalencia ha ido aumentando de manera constante en todo el mundo. Como resultado de esta tendencia, se está convirtiendo rápidamente en una epidemia en algunos países del mundo y se espera que el número de personas afectadas se duplique en la próxima década debido al aumento del envejecimiento de la población, lo que se sumará a la

carga ya existente para los proveedores de atención médica. especialmente en los países poco desarrollados. Esta revisión se basa en una búsqueda en Medline, la base de datos Cochrane de revisiones sistémicas y listas de citas de publicaciones relevantes. El título de tema y las palabras clave utilizadas incluyen diabetes mellitus tipo 2, prevalencia, diagnóstico actual y tratamiento actual. Sólo se incluyeron artículos en inglés. La detección y el diagnóstico todavía se basan en los criterios de la Organización Mundial de la Salud (OMS) y la Asociación Estadounidense de Diabetes (ADA), que incluyen parámetros tanto clínicos como de laboratorio. Aún no se ha encontrado ninguna cura para la enfermedad; sin embargo, las modalidades de tratamiento incluyen modificaciones en el estilo de vida, tratamiento de la obesidad, agentes hipoglucemiantes orales y sensibilizadores a la insulina como la metformina, una biguanida que reduce la resistencia a la insulina, sigue siendo el medicamento de primera línea recomendado, especialmente para pacientes obesos.

Palabras clave: Diabetes mellitus tipo 2, Diagnóstico, Manejo

INTRODUCTION

Diabetes MellitusDiabetes mellitus is a metabolic disorder of multiple etiology characterized by chronic hyperglycemia with disturbance of carbohydrates, fat and protein metabolism resulting fromdefects in insulin secretion, action or both.[2]

Classification:

Diabetes is classified on basis of pathogenic process that leads to hyperglycemia. Two broad categories of DM are designated as TYPE 1 DM and TYPE 2 DM.[1]

Type 1 is termed as Insulin dependent Diabetes Mellitus

- Type I diabetes mellitus is due to deficiency of insulin because of destruction of β-cells inislets of Langerhans.
- This type of diabetes mellitus may occur at any age of life.
- But, it usually occurs before 40 years of age and persons affected by thisrequire insulin injection.

Type 2 is termed as Noninsulin dependent Diabetes Mellitus.

Type II diabetes mellitus is due to insulin resistance (failure of insulin receptors to give response to insulin).

- So, the body is unable to use insulin.
- About 90% of diabetic patients have type II diabetes mellitus.

It usually occurs after 40 years. Only some forms of Type II diabetes require insulin Other types include Gestational Diabetes.

FEATURES	TYPE1 DM	TYPE 2 DM
Age of onset	Usually before 40	Usually after 40 years
Major Cause	Lack of insulin	Lack of insulin receptor
Insulin deficiency	Yes	Partial deficiency
Immune destruction of β-cells	Yes	No
Involvement of other endocrine disorders	No	Yes
Hereditary cause	Yes	May or may not be
Need for insulin	Always	Not in initial stage May require in later stage
Insulin resistance	No	Yes
Control by oral hypoglycemic agents	No	Yes
Symptoms appear	Rapidly	Slowly
Body weight	Usually thin	Usually overweight
Stress-induced obesity	No	Yes
Ketosis	Yes	May or may not be

Type 2DM is characterized by impaired insulin secretion, insulin resistance, excessive hepatic glucose production, and abnormal fat metabolism.

1. ABNORMAL FAT AND LIPID METABOLISM :

Insulin resistance, the decreased ability of insulin to act effectively on target tissues (especially muscle,liver & fat) is a prominent feature of type 2 DM. . Insulin dose-response curves exhibit arightward shift,indicating reduced sensitivity and decrease in maximum glucose utilization.

Insulin resistance impairs glucose utilization by insulin-sensitive tissues and increases

hepatic glucose output; both effects contribute to the hyperglycemia. Insulin receptor levels and tyrosine kinase activity in skeletal muscle are reduced, but these alterations are most likely secondary to hyperinsulinemia and are not a primary defect. Therefore,"postreceptor" defects in insulin- regulated phosphorylation or dephosphorylation appear to play the predominant role in insulin resistance.[1]

2.OBESITY

The obesity accompanying type 2 DM,particularly in a central or visceral location is thought tobe part of the pathogenic process. The increased adipocyte mass leads to increased levels of circulating free fatty acids and other fat cell products. In addition to regulating body weight, appetite and energy expenditure, adipokines also modulate insulin sensitivity. The increased production of free fatty acids and some adipokines may cause insulin resistance in skeletal muscle and liver. Free fatty acids impair glucose utilization in skeletal muscle, promote glucoseproduction by the liver and impair beta cell function.[1]

3.IMPAIRED INSULIN SECRETION

In type 2 DM insulin secretion initially increases in response to insulin resistance to maintain normal glucose tolerance. Initially, the insulin secretory defect is mild and selectively involvesglucose-stimulated insulin secretion. Eventually it progresses to a state of grossly inadequate insulin secretion. [1]

4.INCREASED HEPATIC GLUCOSE AND LIPID PRODUCTION

Insulin resistance results in decreased insulin production which inturn results in Gluconeogenisis causing fasting hyperglycemia.Insulin resistance results in decreased glycogen storage by liver resulting in postprandial.

Increased hepatic glucose production occurs early in the course of diabetes, although likelyafter the onset of insulin secretory abnormalities and insulin resistance in skeletal muscles.

Insulin Resistance in adipose tissue causing increased lipid synthesis in hepatocytes which leadto Nonalcoholic fatty liver.[1]

MATERIALS AND METHODS

A comprehensive research about type 2 diabetes mellitus has been carried out.clinical studies were included along with treatment offered by various therpies(Homoeopathy, ayurveda , unani , yoga and naturopathy)are included in the review.

Search methods for identification of studies

Electronic search

A thorough literature search was conducted in most popular international search databases, including pubmed ,Reasearch gate , and google scholar for all human clinical research trials. direct searches were done on websites of specific peer-reviwed journals that publish articles on homoeopathy.

Search terms

For this search all keywords related to diabetes such as increased glycemic level ,homoeopathy, ayurveda, allopathy,naturopathy were used.

REVIEW OF LITERATURE

The condition diabetes is a multisystemic disease so according to that a remedy which covers the pathological symptoms of diabetes which is cephalandra indica.

Phyto is the Greek word for plant. There are many families of Phytochemical and they help the human body in a variety of ways. This may protect from a host of disease. Cephalandra indica roots contain flavonoid glycoside ombuin 3 arabinofuranoside, Triterpenoid, saponin coccinioside – k, stigmast – 7 –en 3-one, Lupeol, Beta amyrin and beta sitosterol and whole plant is contain aspartic acid, glutamic acid, asparagines, tyrosine, Histidine, phenylalanine and threonine valine arginine. This plant fruits contain taraxerone, taraxerol and ethylcholest-5-en-3beta glucoside, carotene lycopene cryptoxanthin and apo 6 lycopenal, beta sitosterol and taraxero. Steam and leaves contain beta sitosterol,cephalandrol, cephaladnrine A&B, Heptacosane, this aerial part contain heptacosane, cephalandrol, beta sitosterol alkaloids cephalandrine A and cephalandrine B. Pharmacological studies: Antidiabetic activity: Ghose in 1952 introduced this medicine in Homoeopathy through proving and gave few case reportsabout its usefulness in the treatment of diabetes mellitus in mother tincture. The study concluded that continuous administration of C. indica reduces increased level of serum lipidssecondary to the diabetic state.

Various studies related to diabetes mellitus

The effects of Cephalandra indica mother tincture and potencies on blood glucose level, cholesterol level, body weight, and beta-cells of pancreatic islets of Langerhans, in streptozotocin (STZ)-induced diabetic Wistar rats is to be observed in this study. The Glucose uptake was monitored in mother tincture-treated mouse fibroblast cell line. Diabetes mellitus was induced by intraperitoneal injection of STZ (55 mg/kg body weight) in adult male

rats. After three days of injection, diabetic rats received mother tincture orally (750 µL/kg body weight) daily for three weeks, and it was observed that There was a significant reduction of blood glucose level, regain of body weight, and regeneration of beta-cells in the pancreas of the mother tincture-treated rats. Mother tincturetreated 3T3 cells also showed reduced uptake of glucose in comparison to normal cells. From this study we can understand that there is significant antidiabetic effect of Cephalandra indica and lends support for its usage as a homoeopathic medicine.[6]

Second one An article “diabetes therapy” by Dr. P. S. Kamthan in “Advent of Homoeopathy” in janmarch 1994, and another article in the same issue “Quick reference notes on Diabetes” by Dr. Madhu Syal are reared in this article, Dr. Kamthan had written that both liver and pancreas disease are responsible for Diabetes M. Dr. Kamthan cured cases by giving Phosphorus (5 grains in a day 4 times a day) being guided by one symptom only (Patient full of heat desiring for cold drinks). According to Dr. B. C. Chatterjee, Dr. John claimed that Rhus Aeromatic in ten drops to teaspoonful doses of mother tincture was a sovereign remedy for diabetes. Dr. Nash records a case of rheumatic pains, supervening cured with Lactic acid 200. In “Advent of Homoeopathy” Jan- March 1994- quoted elsewhere Dr. B. C. Chaterjee, says in respect of two remedies; “Vaccininum Mytrilloides” decreases sugar in urine with little or no restriction in the diet. Dr. W. Morgan, in his book “diabetes” had given treatment with skimmed milk for few days and also with Phemic acid for complete cure of Diabetes Mellitus. He also cited two cases of Diabetes cured by Phosphoric Acid. One was Phosphoric Acid (1st trituration) and Nitrate of Uranium 6. (Following) which cured in four months. [7]

Another study .In this study ,randomly assigned 522 middle aged, overweight subjects (172 men and 350 women; mean age, 55 years; mean body mass index [weight in kilograms divided by the square of the height in meters], 31) with impaired glucose tolerance to either the intervention group or the control group. Each subject in the intervention group received individualized counseling aimed at reducing weight, total intake of fat and intake of fiber and physical activity. An oral glucose tolerance test was performed annually; the diagnosis of diabetes was confirmed by a second test. The mean duration follow up was 3.2 years, it was observed that The mean amount of weight lost between baseline and at the end of year 1 was 4.2+5.1 kg in the intervention group and 0.8+3.7 kg in the control group; the net loss by the end of year 2 was 3.5+5.5 kg in the intervention group and 0.8+4.4 kg in the control group. The cumulative incidence of diabetes after four years was 11 percent in the intervention group and 23 percent in the control group. During the trial, the risk of diabetes was reduced by 58 percent in the intervention group. The reduction in the incidence of diabetes was directly associated with changes in lifestyle. From this study we understand that Type 2 diabetes can be prevented by changes in the lifestyles of high risk subjects.[8]

The present study aimed at evaluate the role of these homoeopathic preparations in glycation induced structural modifications and further to examine their cellular protection ability. In human erythrocytes, in vitro mother tincture and dilutions of Syzygium jambolanum Q,30C,200C Cephalandra indica Q,30C,200C and standard antiglycator were compared and their antiglycation potential assessed by the estimating different markers of glycation, structural modifications. Phytochemical characterization was performed.

The homoeopathic preparation have different mode of action on albumin glycation modifications. Syzygium jambolanum Q preparation demonstrated effective inhibition of all glycation, structural modifications except amino group protection. When dilutions were compared, Syzygium jambolanum preparations showed reduction of glycation, structural modifications. All preparations showed significant erythrocyte protection. Syzygium jambolanum Q preparation exhibited noteworthy antiglycation and cell protection ability as compared to antiglycator.These homoeopathic preparations especially Syzygium jambolanum Q prevented glycation induced albumin modifications and subsequent toxicity in human erythrocyte in vitro.

Another study was effective in showing efficiency of cephalandra indica ,

Role of Cephalandra indica Q, in the management of patients suffering from Diabetes mellitus (type I or type II) continuing on anti-diabetic treatment for maintenance of blood sugar levels and to identify its reliable indications. This open, prospective, observational study was carried out during the period July 1992 - March 2000; 96 patients with post-prandial blood sugar level more than 160 mg/dL even after taking anti-diabetic medicine were enrolled for the study. All the patients were administered with Cephalandra indica Q in the dosage, one drop per kilogram of their body weight. The dose was divided in three parts, mixed with one ounce of water and was given three times a day, until disappearance of all signs and symptoms along with control of Blood sugar level. Fasting and post-prandial blood and urine sugar levels were measured on every follow-up visit of the patient. Other required investigations were also conducted. All the patients were advised to take low calorie and high fiber diet, do regular physical exercise and to avoid physical and mental stress. In this study Out of 96 patients registered, 88 patients were followed up. Mean FBS level of patients before treatment was 138.90 ± 24.388 (range 83 to 216 mg/dL) whereas mean FBS after treatment was 115.86 ± 26.363 (range 64 to 202 mg/dL). Mean PPBS level before treatment was 265.08 ± 44.675 (range 178 to 386 mg/dL) whereas mean PPBS after treatment was 204.75 ± 39.968 (range 116 to 341 mg/dL). Dosage of allopathic medicines was reduced in maximum number of patients but, it was completely withdrawn in 17 patients. There was improvement in signs and symptoms, along with decrease in recurrence: no recurrence in 9 patients, recurrence with less intensity in 55. The indications for Cephalandra also verified. From This study it is observed that Cephalandra indica Q is effective in maintaining blood sugar level. Future controlled studies with Cephalandra indica alone and along with other 46 conventional anti-diabetic medicines, by doing the required laboratory tests, are suggested to explore more about the hypoglycemic effect of Cephalandra indica.[9]

Another study of Diabetic nephropathy (DN) is the foremost cause of morbidity and has become the most recurrent cause of end-stage renal disease among diabetic patients. Thus, agents having antidiabeticeffect along with safety potential in the kidneys would have a higher remedial value. Various phytoconstituents reported in C. indica are cephalandrol, tritriacontane, lupeol, b-sitosterol,cephalandrine A, cephalandrine B, stigma-7-en-3-one, taraxerone and taraxerol. Terpenoids are found to be responsible for antidia-betic activity. DN was induced by intraperitoneal injection of STZ (60 mg/kg) 15 min after Nicotinamide (230 mg/kg, i.p.) administration. Rats were divided into six groups (n ¼ 6). Group 1 and 2 was kept normal control and diabetic control respectively whereas Groups 3e5 consist of diabetic nephropathy rats treated with different doses of C. indica Mother tincture, 6C and 30 C potencies for 45 days. Glimepride (10 mg/kg) was used as standard. DN was assessed by

determining serum glucose, urea,uric acid, creatinine level and tissue histological examination. Tissue antioxidant enzymes (SOD, GSH,LPO) level was measured to assess the oxidative stress. Also, the level of advanced glycation end products in kidney was determined. Mother tincture, 6C and 30 C potencies of C. indica produced significant attenuation in the biochemical parameters used to assess diabetic nephropathy that Mother tincture, 6C and 30 C potencies of C. indica confers protective effect against diabetic nephropathy via inhibition of Oxidative stress and AGE's.[9]

CONCLUSION

According to the gathered data about use of homoeopathy therapy for diabetes mellitus.According to all analysis of the subjects homoeopathy is successful in treatment of diabetes and the remedy cephalandra indica is effective in the treatment of diabetes.

These studies gave valuable information on homoepathic approaches in treatment of diabetes.

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