INTRODUCTION
Diabetes mellitus is a clinical syndrome characterised by hyperglycaemia due to absolute or relative deficiency of insulin. Under ICD 10-CM Classification diagnosis Code of Type II Diabetes Mellitus is E11.9 (Type II Diabetes Mellitus without any Complication). This can arise in many different ways but is most commonly due to autoimmune type 1 diabetes or to adult-onset type 2 diabetes. Lack of insulin affects the metabolism of carbohydrate, protein and fat, and can cause a significant disturbance of water and electrolyte homeostasis. Diabetes occurs world-wide and the incidences of both type 1 and type 2 diabetes are rising; it is estimated that, in the year 2000, 171 million people had diabetes, and this is expected to double by 2030. This global pandemic principally involves type 1 diabetes mellitus.

Key Words:
Homeopathy, Diabetes Mellitus type II, Syzizium Jmbolanum, Gymnema Sylvester, Randomized comparative trial, single blind, FBS, PPBS, HbA1C etc

ABSTRACT
Purpose/background of study: The burden of Type II Diabetes mellitus increased worldwide. World Health Organization report show that 300 million people may suffer from Diabetes up to 2025 in which 79 million people from India. India Become the capital of Diabetes mellitus. Most common is Type II Diabetes Mellitus in which body does not make enough insulin or does not properly utilize it. Homeopathy, a common form of alternative medicine is used worldwide and plays a major role in healing of different diseases. Due to minimal side-effects, homoeopathic remedies may serve as potential method of treatment in the management of diabetes. Objective: The objectives of this study to evaluate the mean change in blood glucose level (FBS, PPBS & HbA1C) after administration of homoeopathic medicines Gymnema Sylvestre Q along with life style modification (LSM) compared to Syzygium Jambolanum Q along with Life style modification.

Material & Method: This is Single-blind randomized comparative trial was conducted in Sri Ganganagar Homoeopathic Medical college Hospital and Research Institute, Sri Ganganagar, Rajasthan from August 2018 to December 2019. A total 60 participants suffering from type II Diabetes Mellitus were randomly allocated in two interventional group of 30 participant. Group A receive Gymnema Sylvester Q and Group B receive Syzygium Jambolanum Q for 6 months. Assessment was done at Pre and Post treatment using different stastical test like Independent 2 sample T test or Mann Whitany Test at significance level <0.5.

Observation and Result: Total 60 (n) participant analyzed after study. Group A which received Gymnema Sylvester Q show change in Fasting blood sugar level(Mean±SD) 148.16 ±16.73 to 96.76 ±8.70 mg/dl, Post Prandial Blood Sugar Level (Mean±SD) 235.36 ±17.71 to 148.36 ±29.52 mg/dl, HbA1C from 7.82 ± 0.54 to 7.16 ± 0.55. Group B which received Syzygium Jambolanum Q show change in Fasting blood sugar level (Mean±SD) 147.83 ±15.54 to 100.43 ± 14.23 mg/dl, Post Prandial Blood Sugar Level (Mean±SD) 235.33 ±19.25 to 149.93 ± 15.37 mg/dl, HbA1C from 7.85 ± 0.45 to 7.23 ± 0.40. Data is normally distributed (K-S Test) so we used 2 sample independent T test for comparison of both group before and after treatment. After applying the t test show that change in level of FBS, PPBS and HbA1C in both group is non significant. It show that both the drug Gymnema Sylvester Q and Syzygium Jambolanum Q have same blood sugar lowering capacity.

Conclusion: The result of this study show that both the Medicine have similar effect on diabetes mellitus type II. Mean changes blood sugar level of both group is non significant. This study give evidence that Homoeopathic medicine reduce the blood sugar level effectively.

Copyright © Pranesh Kuamar Singh, Anil vangani and Poonam Singh, 2020, this is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

*Corresponding author: Pranesh Kuamar Singh
Assistant Professor, Sri ganganagar Homoeopathic Medical College hospital and Research Institute, Sri Ganganagar, India
Randomized Pranesh Kuamar Singh, Anil vangani and Poonam Singh, Efficacy of Gymnema Sylvestre and Syzygium Jambolanum in Case of Type ii Diabetes Mellitus – A Randomized Comparative Trial

2 diabetes, to which several factors contribute, including greater longevity, obesity, unsatisfactory diet, sedentary lifestyle and increasing urbanisation. Many cases of type 2 diabetes remain undetected.1,2,3,4

After meals, blood insulin levels rise. Insulin is an anabolic hormone with profound effects on the metabolism of carbohydrate, fat and protein. Insulin is secreted from pancreatic β cells into the portal circulation, with a brisk increase in response to a rise in blood glucose. Insulin lowers blood glucose by suppressing hepatic glucose production and stimulating glucose uptake in skeletal muscle and fat.5,6

Type 1 diabetes was previously termed 'insulin-dependent diabetes mellitus' (IDDM) and is invariably associated with profound insulin deficiency requiring replacement therapy. Type 2 diabetes was previously termed 'non-insulin-dependent diabetes mellitus' (NIDDM) because patients retain the capacity to secrete some insulin but exhibit impaired sensitivity to insulin (insulin resistance) and can usually be treated without insulin replacement therapy. However, up to 20% of patients with type 2 diabetes will ultimately develop profound insulin deficiency requiring replacement therapy so that IDDM and NIDDM were misnomers.1,2,6

Type 2 diabetes is a more complex 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 β-cell function leading to 'relative' insulin deficiency.1,2,6

In patients with type 2 diabetes excessive production of glucose in the liver and under-utilisation of glucose in skeletal muscle result from resistance to the action of insulin. A characteristic feature of type 2 diabetes is that it is often associated with other medical disorders, particularly central (visceral) obesity, hypertension and dyslipidaemia (characterised by elevated levels of small dense LDL cholesterol and triglycerides, and a low level of HDL cholesterol).2,3

Epidemiological studies provide evidence that type 2 diabetes is associated with overeating, especially when combined with obesity and underactivity. Obesity probably acts as a diabetogenic factor (through increasing resistance to the action of insulin).

**Symptoms of Hyperglycaemia** 2

1. Thirst, dry mouth
2. Polyuria
3. Nocturia
4. Tiredness, fatigue
5. Recent change in weight
6. Blurring of vision
7. Pruritus vulvae, balanitis (genital candidiasis)
8. Nausea; headache
9. Hyperphagia; predilection for sweet foods
10. Mood change, irritability, difficulty in concentrating, apathy

Diabetes Mellitus diagnosed by simple blood sugar level (Fasting and Post Prandial Blood sugar level) test easily. Glycated haemoglobin provides an accurate and objective measure of glycaemic control over a period of weeks to months. This can be utilised as an assessment of glycaemic control in a patient with known diabetes.6

**Criteria for the Diagnosis of Diabetes Mellitus**1,2

- Symptoms of diabetes plus random blood glucose concentration -11.1 mmol/L (200 mg/dL) or
- Fasting plasma glucose -7.0 mmol/L (126 mg/dL) or
- Two-hour plasma glucose -11.1 mmol/L (200 mg/dL) during an oral glucose tolerance test

The methods of treatment of diabetes are: dietary/lifestyle modification, oral anti-diabetic agents and insulin by injection. Approximately 50% of new cases of diabetes can be controlled adequately by diet alone, 20-30% will need an oral anti-diabetic medication, and 20-30% will require insulin. The development of a foot ulcer, renal impairment, sensory loss or retinopathy in a patient with long-standing diabetes would be recognised as a long-term complication.2,6

Homoeopathy, a common form of alternative medicine is used worldwide and plays a major role in healing different diseases. Due to minimal side-effects, homoeopathic remedies may serve as potential method of treatment and in the management of diabetes.

Homoeopathy is one of the most widespread alternative system of medicine based on the two cardinal principles “law of similarities” and “minimal dilution”. Homeopathy seeks to cure in accordance with natural laws of healing and uses medicine made from natural substances viz. animal, vegetable and mineral. Some important homoeopathic oral hypoglycaemic drugs are Gymnema Syl., Rhus Aromatica, Syzygium Jambolanum, Uranium Nitricum and Acid Phosphoricum. Etc.

**Objectives**

**Primary objectives**

1. To determine the feasibility in evaluating the effect of homoeopathy on impaired glucose regulation.
2. To evaluate the mean change in blood glucose level after administration of homoeopathic medicines Gymnema Sylvestre Q along with life style modification (LSM) compared to Syzygium Jambolanum Q with LSM according to routine method

**Secondary objectives:** To evaluate the effects of Gymnema Sylvestre Q & Syzygium Jambolanum Q interventions upon-1. Fasting blood glucose(FBS), and Post prandial blood glucose(PPBS) level 2. HbA1c 3. Symptomatic changes

**Hypothesis**

H₀ (Null Hypothesis): There is no association (Significant difference) between efficacy of Gymnema Sylvestre and Syzygium Jambolanum in Case of Type II Diabetes Mellitus.

H₁ (Alternative Hypothesis): Gymnema Sylvestre is more efficacious than Syzygium Jambolanum in case of Type II Diabetes Mellitus.

H₂ (Alternative Hypothesis): Syzygium Jambolanum is more efficacious than Gymnema Sylvestre in case of Type II Diabetes Mellitus.

---

37494 | Page
MATERIAL AND METHODS

Study Setting and Study Design: This was Single blind Comparative trial (Parelal arm Active controlled trial) conducted at OPD, Health camp of Sri Ganganagar Homoeopathic Medical College Hospital and Research Institute, Sri ganganagar Rajasthan. The duration of study was 18 months. Ethical Clearance: The study protocol was approved by Institutional ethical comitee of Tantia university Prospectively.

Trial Registration: The trial has been registered in Clinical Trial Registry -India (CTRI) no. CTRI/2018/07/014903, Trial Registered Prospectively and The Universal Trial Number U1111-1227-0842.

Inclusion and Exclusion Criteria

Inclusion Criteria
1. All the patient fulfilling the case definition of Type II Diabetes Mellitus (FBS=126 and PPBS >200 Mg/dl)
2. All the patient presenting the symptoms of Diabetes mellitus.
3. Patient of both sexes and all age group.
4. Patients suffering from Type 2 DM , willing to participate and taking treatment regularly and co-operating for regular follow-up.

Exclusion Criteria
1. Patient without informed consent.
2. Patient with severe complication of Diabetes Mellitus
3. Patient which require emergency medical intervention.
4. Imuno-compromised patient
5. Patient who not follow advice and medicine properly.

Sampling method and Size: Total 60 patient included my study after considering the inclusion and exclusion criteria. The patient divided into two group by simple random sampling methos with the help of generate random number table from www.randomizer.org.

Intervention: The patient was divided into two interventional group. Each group alocated 30 patient. Group 1 (GS) received Gymnema Sylvester Mother Tincture as a homoeopathic medicine and Group 2 (SJ) received Syzizium Jambolanum Mother Tincture. Medicine given in similar form in both the group. This study was single blind study, so patient does not know they take which medicine.

Outcome assessment: In this study we used the before and after (Pre and Post test study design) asessment of Fasting, Post Prandial blood sugar and HbA1C from standard laboratory.

Statistical Analysis: Both descriptive and inferential statistics were used. Intention-to-treat sample was subjected to statistical analysis. First check the normality of data with the help of Kolmogorov- Smirnov Test (K-S Test). Then appropriate statistical Two Sample Independent T Test (Data is Normaly distributed) was applied. P < 0.05 two tailed stastically significant. statistical calculator of social science, Quick calculator of graph pad and Microsoft Excell used for analysis of data.

Result (Observation and Analysis)

Study Flow: A total 80 patient were screened for study in which 60 included in study on basis of inclusion and exclusion criteria of our study. 20 patients were excluded during screening.

Sociodemographic Features: In my study mean age of diabetic patient was 55.86±5.5 yrs (Mean ±SD), Maximum number of cases from age group 50 -60 Years i.e. 40 (66.67%), during my study diabetes mellitus type II was common in Male patient (n=35, 58.33%) than female patient (n=25, 41.67%). Diabetes is prevalent in rural area (n=42, 70%) than urban area (n=18, 30%) (Table no.1)

Pre and Post Treatment comprision (Use of 2 sample Independent T Test)

Table 2 Calculation and result of 2 sample Independent T Test

Data is normaly distributed (K-S Test) so we used 2 sample independent T test for comparison of both group before and after treatment. After applying the independent T test show that
change in level of FBS, PPBS and HbA1C in both group was non significant.

**DISCUSSION**

When we compared the both Gymnema Sylvester Q Group and Syzizium Jambolanum Q Group, Pre and Post FBS/PPBS and HbA1C level was non significant after 6 months of treatment. By applying pre and post 2 sample Independent T test show that Null Hypothesis is accepted, it means no significant difference in result of both group. Both drugs Gymnema Sylvester Q and Syzizium Jambolanum Q have similar effect on blood sugat level.

**CONCLUSION**

Homoeopathic medicine was not only reduce the suffering but also improve the quality of life of patient. Both Homoeopathic Medicine show that they have sugar reducing effect in Type II Diabetes Patient but action of both medicine is similar in nature (blood sugar lowering capicity). We use both medicine as sugar killer in case of Type II Diabetes Mellitus Patient.

**Conflict of interest**- None declared

**References**

8. Miracles of Mother Tinctures with Therapeutic hints and Treatment of Disease by Dr.Yadubir Sinha, B. Jain Publishers New Delhi. 126 Pages.


13. ICD 10 CM, International Classification of disease by CDC and WHO.


How to cite this article:

**********