



ASSESSING CEPHALANDRA INDICA MOTHER TINCTURE AS ADD-ON THERAPY FOR HBA1C IN TYPE 2 DIABETES IN AGE GROUP BETWEEN 30-75

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Abstract

The global prevalence of Diabetes Mellitus (DM) has experienced a significant surge over the past two decades, escalating from approximately 30 million cases in 1985 to a staggering 177 million cases in 2000. The rise of DM is attributed, in part, to sedentary lifestyles. In India, it is projected that around 79.4 million individuals may be affected by Diabetes Mellitus by the year 2030. Amidst this growing health concern, Homoeopathy has emerged as an essential therapeutic modality, offering organ-specific medicines in the form of mother tinctures. This clinical study focuses on individuals with Diabetes Mellitus Type 2 within the age group of 30-75 years. A total of 32 patients, comprising both pre-diagnosed and newly diagnosed DM cases, were enrolled in the study. Among them, 30 patients, comprising both male and female participants, successfully completed the study, while two individuals dropped out during the research. The study assessed the impact of Homoeopathic treatment on Fasting, Post-prandial blood sugar levels, and HbA1c levels. The experimental group, consisting of 30 patients who received medication, experienced notable improvements in 23 cases. However, in seven cases, no significant improvement was observed. The medicine employed for treatment was Cephalandra Indica in tincture form, chosen for its recognized antidiabetic properties. The findings of this study contribute to the growing body of evidence supporting the efficacy of Homoeopathy as an adjunctive therapeutic approach for Diabetes Mellitus Type 2. Further research and larger-scale studies are warranted to validate these outcomes and explore the full potential of Homoeopathy in managing this widespread chronic disorder.

Keywords: Cephalandra Indica, Diabetes mellitus type 2, HbA1C, Homoeopathy.

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INTRODUCTION:

Promoting a healthy way of life involves prioritizing adequate nutritious food, proper rest, and a conducive environment. However, due to rapid economic development, urbanization, globalization, and the increasing westernization of lifestyles, there has been a significant rise in lifestyle-related diseases among Indians in recent times. These diseases present a formidable challenge to treatment, particularly in chronic cases, hindering the path to recovery [1]. Globally, non-communicable diseases account for a staggering 70% of all deaths, and India ranks as one of the top countries with a high prevalence of diabetes. According to the World Health Organization, approximately one in every twelve Indians is diabetic, resulting in 1.4 million deaths, making diabetes a significant contributor to the "Global Burden of Diseases" [2].

Diabetes mellitus is an escalating health concern, burdening individuals and society alike. Besides the morbidity and mortality linked to complications like retinopathy, neuropathy, and nephropathy, cardiovascular diseases remain the leading cause of death. Lifestyle disorders are like the tip of an iceberg, with their incidence and prevalence growing worldwide. Once considered primarily affecting middle-aged and older individuals, these diseases are now becoming alarming afflictions among the younger population as well. These illnesses pose a significant threat to the overall progress of the nation, impacting the productive years of life and necessitating urgent attention to address their root causes and implement effective preventive measures [3].

Diabetes mellitus:

Diabetes mellitus, commonly known as diabetes, is a chronic metabolic disorder characterized by high blood glucose levels (hyperglycemia). It occurs when the body either does not produce enough insulin (a hormone that regulates blood sugar) or cannot effectively use the insulin it produces. There are several types of diabetes, but the two main forms are type 1 diabetes and type 2 diabetes [4].

Classification of Diabetes Mellitus:

Type 1 Diabetes:

It is an autoimmune disease where the immune system attacks and destroys the insulin-producing beta cells in the pancreas. As a result, the body produces little to no insulin. Type 1 diabetes usually develops during childhood or adolescence and requires lifelong insulin therapy [5].

Type 2 Diabetes:

This is the most common form of diabetes and is often associated with lifestyle factors such as obesity and physical inactivity. In type 2 diabetes, the body becomes resistant to insulin, and the pancreas may also fail to produce enough insulin. It can be managed with a combination of lifestyle changes, oral medications, and insulin (in some cases) [6].

Gestational Diabetes:

This type of diabetes occurs during pregnancy when hormonal changes lead to insulin resistance. It typically resolves after childbirth, but women with gestational diabetes have a higher risk of developing type 2 diabetes later in life [7].

Other Specific Types:

There are several other specific types of diabetes caused by various factors, such as genetic mutations, diseases of the pancreas, drug-induced diabetes, and more.

Complications of Diabetes Mellitus:

If diabetes is not well managed, it can lead to several long-term complications, affecting various organs and systems in the body. Some common complications include [8]:

Cardiovascular Complications: Increased risk of heart disease, heart attack, stroke, and high blood pressure.

Neuropathy: Nerve damage, which can result in tingling, numbness, and pain, typically affecting the hands and feet.

Nephropathy: Kidney damage or failure, which may progress to end-stage renal disease.

Retinopathy: Damage to the blood vessels in the retina, leading to vision problems and potential blindness.

Foot Complications: Poor circulation and nerve damage in the feet, increasing the risk of infections and amputations.

Skin Conditions: Higher susceptibility to bacterial and fungal infections.

Complications During Pregnancy: Increased risk of complications for both the mother and the baby.

Treatment Procedures for Diabetes Mellitus:

Lifestyle Modifications: Adopting a healthy lifestyle is crucial for managing diabetes. This includes maintaining a balanced diet, engaging in regular physical activity, managing weight, and avoiding smoking and excessive alcohol consumption [9].

Medications: Depending on the type and severity of diabetes, various oral medications or insulin

therapy may be prescribed to help regulate blood sugar levels.

Blood Sugar Monitoring: Regular monitoring of blood glucose levels helps individuals make appropriate adjustments to their treatment plan.

Insulin Therapy: Essential for type 1 diabetes and sometimes required for type 2 diabetes when other treatments are insufficient.

Diabetes Education: Patients should receive proper education about their condition, including self-care, monitoring, and recognizing symptoms of complications.

Managing Blood Pressure and Cholesterol: Controlling blood pressure and cholesterol levels helps reduce the risk of cardiovascular complications.

Regular Medical Check-ups: Regular visits to healthcare providers are vital for monitoring diabetes, assessing complications, and adjusting treatment as needed.

Remember, diabetes is a chronic condition, and effective management can significantly improve the quality of life for those affected. It's essential for individuals with diabetes to work closely with their healthcare team to develop a personalized treatment plan that suits their needs and lifestyle. Early detection, proper management, and a healthy lifestyle are key to reducing the risk of complications associated with diabetes mellitus.

Homoeopathic medicines have shown effectiveness in treating Diabetes Mellitus type 2. Numerous cases of this condition have been successfully managed using homoeopathic mother tinctures containing antidiabetic properties, such as *Cephalandra Indica*.

Cephalandra indica

Cephalandra indica displays a wide range of Phytochemicals, including saponins, flavonoids, sterols, and alkaloids, which contribute to various pharmacological activities. The term 'Phyto' originates from the Greek word for plant, and these natural compounds exist in numerous families, benefiting the human body in diverse ways. They have the potential to protect against various diseases [10].

The roots of *Cephalandra indica* contain flavonoid glycoside ombuin 3 arabinofuranoside, Triterpenoid, saponin coccinioside – k, stigmast – 7 –en 3-one, Lupeol, Beta amyryl, and beta sitosterol. The whole plant contains aspartic acid, glutamic acid, asparagines, tyrosine, histidine, phenylalanine, threonine, valine, and arginine. The plant's fruits contain taraxerone, taraxerol, and ethylcholest-5-en-3beta glucoside, carotene, lycopene, cryptoxanthin, apo 6 lycopenal, beta sitosterol, and taraxero. The stem and leaves contain beta

sitosterol, cephalandrol, cephaladrine A&B, and heptacosane, while the aerial parts contain heptacosane, cephalandrol, beta sitosterol, and alkaloids cephaladrine A and cephaladrine B.

In pharmacological studies, *Cephalandra indica* has shown promising antidiabetic activity. As early as 1952, Ghose introduced this medicinal plant in Homeopathy, conducting studies and reporting its effectiveness in treating diabetes mellitus in mother tincture form. The study demonstrated that continuous administration of *C. indica* can reduce elevated levels of serum lipids associated with diabetes [11].

MATERIALS AND METHODS:

Study Design

An experimental clinical study was carried out in Bharati Vidyapeeth medical foundation Homoeopathic Hospital, Pune.

Study duration:

The study was conducted approximately for 18 months.

Statistical Method:

Paired t-test and Descriptive statistics of the Fasting- Blood Glucose level mg/dl, Post prandial blood sugar level mg/dl, HbA1c before and after the intervention. P Value <0.001, Considered to be statistically highly significant. Paired t-test and Descriptive statistics of the Fasting- Blood Glucose level mg/dl, Post prandial blood sugar level mg/dl, HbA1c before and after the intervention. P Value <0.001, Considered to be statistically highly significant. Hence there is a significant difference in the HbA1c, fasting blood sugar levels, post prandial blood sugar level before and after the intervention. A test used: Paired t-test.

Sampling procedure:

Sample size will be minimum 30 cases with 5 follow up. Cases were selected from OPD, IPD of Bharati Vidyapeeth medical foundation Homoeopathic Hospital, peripheral OPD and various rural and urban camp series.

Selection of remedy:

After careful and detail case study *Cephalandra Indica*. The remedy was administered in mother tincture.

Drug dispensing:

Dispensed in mother tincture 10 drops thrice in 30 ml of water.

Table1: Distribution of patients according to age

| Age Group | No of patients | Percentage |
|-----------|----------------|------------|
| 30-35 | 5 | 16.67% |
| 35-40 | 9 | 30.00% |
| 45-50 | 2 | 6.67% |
| 40-45 | 5 | 16.67% |
| ABOVE50 | 9 | 30.00% |

Above **Table 1** shows that 30% of the patients had an age above 50 years, 6% had an age between 45-50 years, 17% had an age between 40-45 years, 30% of the patients had an age between 35-40 years, 17% of patients had age between 30-35 years in the study.

Table 2: Distribution of Patients according to Gender

| Gender | Number of patients | Percentage |
|--------|--------------------|------------|
| Female | 13 | 43.33% |
| Male | 17 | 56.67% |

RESULTS:

The study involved 30 patients, all of whom completed the experimental treatment with medication. Among the 30 patients, 23 of them showed a marked improvement in their condition after the treatment, while the remaining 7 patients did not show any improvement.

Before the treatment, the patients' average HbA1c level was 7.62 ± 0.52 (mean \pm standard deviation). After the treatment, there was a noticeable reduction in the HbA1c level, with the average value dropping to 7.53 ± 0.54 .

Hypothesis Tested:

H_0 : Cephalandra indica Q is not effective in the management of type 2 diabetes mellitus in the age group of 30-75 years.

Vs

H_1 : Cephalandra indica Q is effective in the management of type 2 diabetes mellitus in the age group of 30-75 years.

Table 3: Paired t-test and Descriptive statistics of the HbA1c before and after the intervention.

| HbA1c | N | Mean+ SD | T Statistic Value | P-Value |
|------------------------|----|------------------|-----------------------------------|----------------|
| before intervention | 30 | 7.62 ± 0.52 | 4.65 | 0.000** |
| after intervention | 30 | 7.53 ± 0.54 | | |
| Mean difference | | 0.087 ± 0.10 | 95% CI for Mean difference | (0.049, 0.126) |

P Value <0.001, Considered to be statistically highly significant.

Hence there is a significant difference in the HbA1c before and after the intervention.

A test used: Paired t-test, **: Highly Significant Difference, T Statistic-value: Test Statistic value.

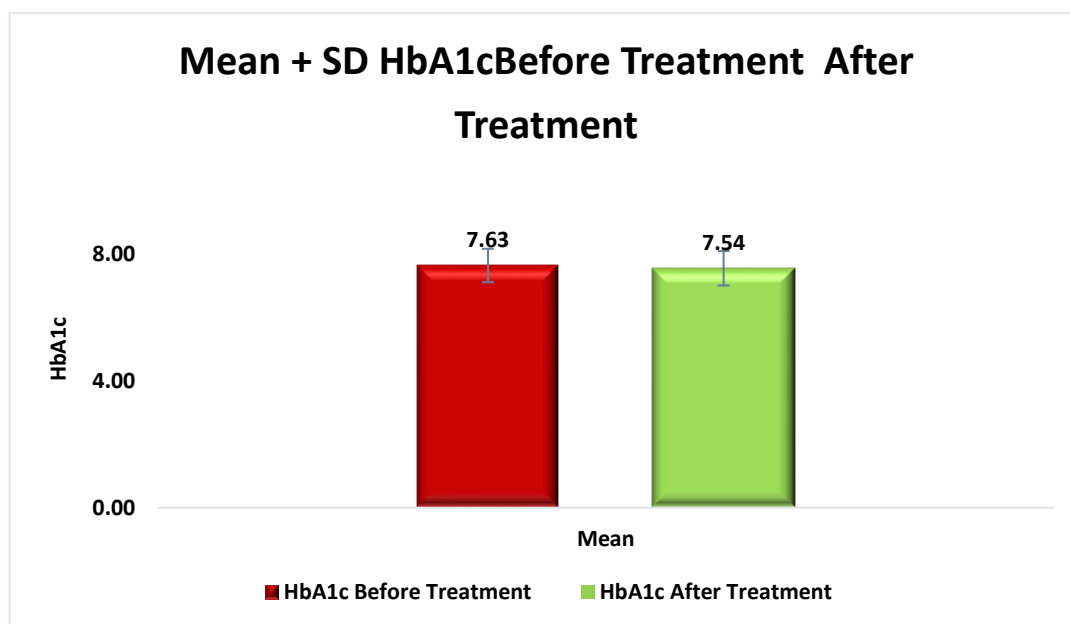


Fig 1: Bar diagram representing the Average + SD of HbA1c before and after the intervention.

Table 3 and Fig 1 show descriptive Statistics and paired t-test results of the HbA1c before and after the intervention in the management of Diabetes

Mellitus Type 2. Before treatment, HbA1c was 7.62 ± 0.52 (mean+ SD) which reduces to 7.53 ± 0.54 after treatment. To test the hypothesis of

whether the average HbA1c in patients, before and after the intervention of Homoeopathic medicine remains the same or not, the Paired t-test is used. T-statistic value is 4.65 with a p-value of 0.000 **

highly significant. We reject Ho and conclude that there is a significant difference in average HbA1c before and after the intervention of Homoeopathic medicine.

Table 4: Paired t-test and Descriptive statistics of the Fasting- Blood Glucose level mg/dl before and after the intervention.

| Fasting- Blood glucose level mg/dl | N | Mean±SD mg/dl | T Statistic Value | P-Value |
|------------------------------------|----|---------------|--|---------|
| before intervention | 31 | 144.3± 23.08 | 4.54 | 0.000** |
| after intervention | 31 | 135.5± 19.15 | | |
| Mean difference | | 8.8± 10.61 | 95% CI for mean difference: ((4.83, 12.76) | |

P Value <0.001, Considered to be statistically highly significant. Hence there is a significant difference in the Fasting- Blood glucose level mg/dl before and after the intervention. A test used: Paired t-test, **: Highly Significant Difference, T Statistic-value: Test Statistic value.

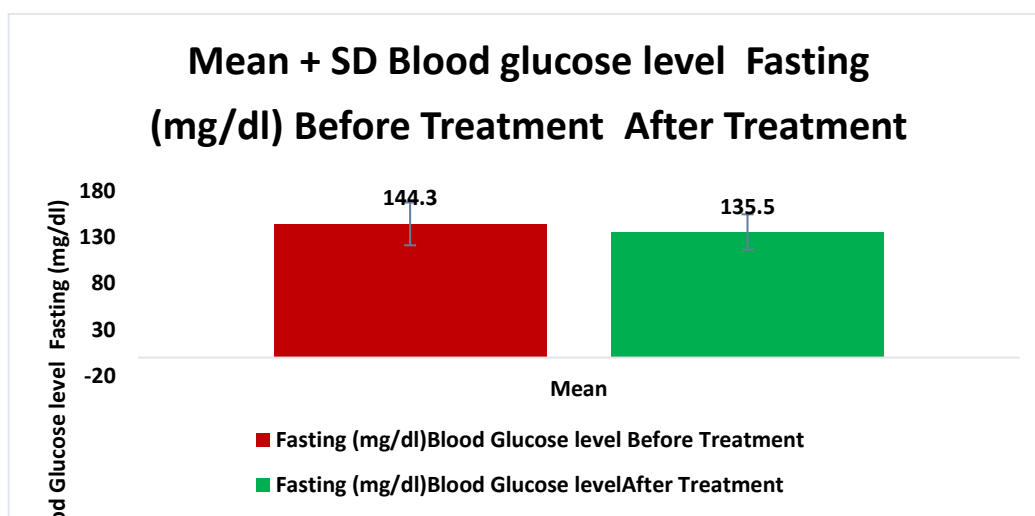


Fig 2: Bar diagram representing the Average ± SD of Fasting- Blood glucose level mg/dl before and after the intervention.

Table 4 and Fig 2 show descriptive Statistics and paired t-test results of the Fasting- Blood glucose level mg/dl before and after the intervention of Cephalandra indica Q in Diabetes Mellitus Type 2.

Before treatment, Fasting- Blood glucose level mg/dl was 144.3± 23.08 (mean± SD) which reduces to 135.5± 19.15 after treatment. To test the hypothesis of whether the average Fasting- Blood

glucose level (mg/dl) in patients, before and after the intervention of Homoeopathic medicine remains the same or not, the Paired t-test is used. The T-statistic value is 4.54 with a p-value of 0.000 ** highly significant.

We reject Ho and conclude that there is a significant difference in average Fasting- Blood glucose level (mg/dl) before and after the intervention in Homoeopathic medicine.

Table 5: Paired t-test and Descriptive statistics of the Pp- Blood glucose level mg/dl before and after the intervention.

| Pp- Blood glucose level mg/dl | N | Mean±SD | T Statistic Value | P-Value |
|-------------------------------|----|---------------|---|---------|
| before intervention | 30 | 202.2 ± 43.61 | 4.26 | 0.000** |
| after intervention | 30 | 190.3± 36.34 | | |
| Mean difference | | 11.93 ± 15.33 | 95% CI for mean difference: (6.20, 17.66) | |

P Value <0.001, Considered to be statistically highly significant. Hence there is a significant difference in the Pp- Blood Glucose level mg/dl before and after the intervention. A test used: Paired t-test, **: Highly Significant Difference, T Statistic-value: Test Statistic value.

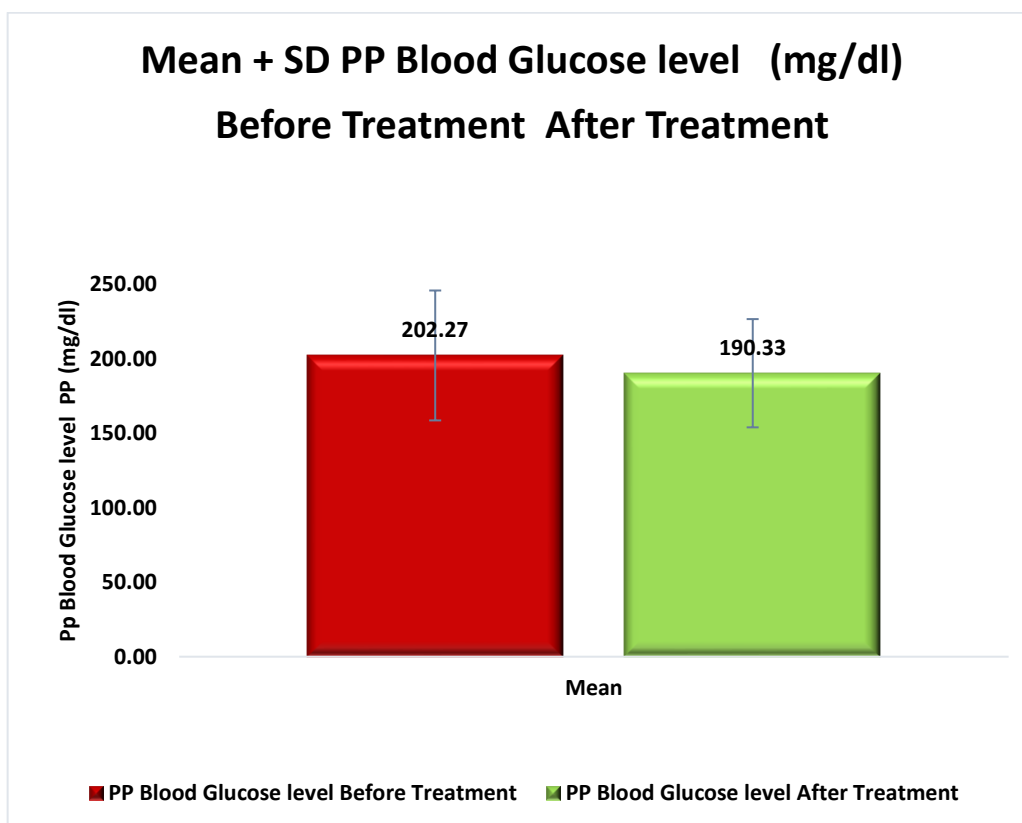


Fig 3: Bar diagram representing the Average \pm SD of Pp- Blood glucose level mg/dl before and after the intervention.

Table 5 and Fig 3 show descriptive Statistics and paired t-test results of the Pp- Blood glucose level mg/dl before and after the intervention of *Cephalandra indica* Q in Diabetes Mellitus Type 2. Before treatment, Pp- Blood glucose level mg/dl was 202.2 ± 43.61 (mean \pm SD) which reduces to 190.3 ± 36.34 after treatment. To test the hypothesis of whether the average Pp- Blood glucose level (mg/dl) in patients, before and after

the intervention of Homoeopathic medicine remains the same or not, the Paired t-test is used. T-statistic value is 4.26 with a p-value of 0.000 ** highly significant. We reject H_0 and conclude that there is a significant difference in average Pp- Blood glucose level (mg/dl) before and after the intervention in Homoeopathic medicine. From Table 3,4 5 we can conclude that *Cephalandra indica* Q is effective in the management of type 2 diabetes mellitus in the age group of 30-75 years.

Table 6: Descriptive statistics of the HbA1c ,Fasting- Blood glucose level mg/dl, Pp- Blood glucose level mg/dl before and after the intervention.

| Variable under study | N | Mean \pm SD | Minimum | Maximum |
|---|----|-------------------|---------|---------|
| HbA1c Before Treatment | 30 | 7.62 ± 0.52 | 6.7 | 8.5 |
| HbA1c After Treatment | 30 | 7.53 ± 0.54 | 6.28 | 8.4 |
| Fasting Blood glucose level mg/dl Before Treatment | 30 | 144.3 ± 23.08 | 100 | 189 |
| Fasting Blood glucose level mg/dl After Treatment Fasting | 30 | 135.5 ± 19.15 | 100 | 179 |
| Pp Blood glucose level mg/dl Before Treatment PP mg/d | 30 | 202.2 ± 43.61 | 140 | 267 |
| Pp Blood glucose level mg/dl After Treatment PP | 30 | 190.3 ± 36.34 | 140 | 260 |

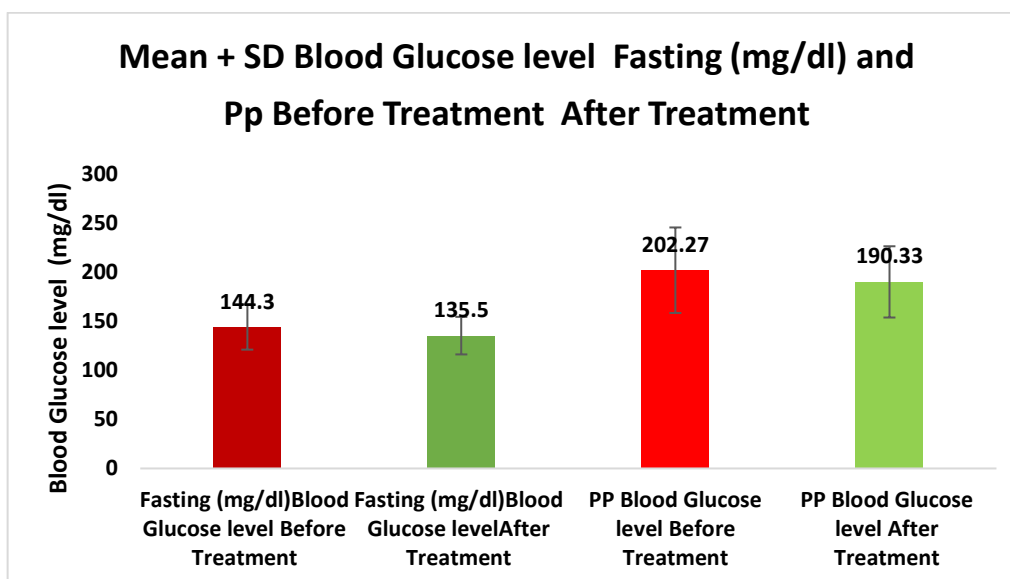


Fig 4: Bar diagram representing the Average \pm SD of fasting and Pp- Blood glucose level mg/dl before and after the intervention.

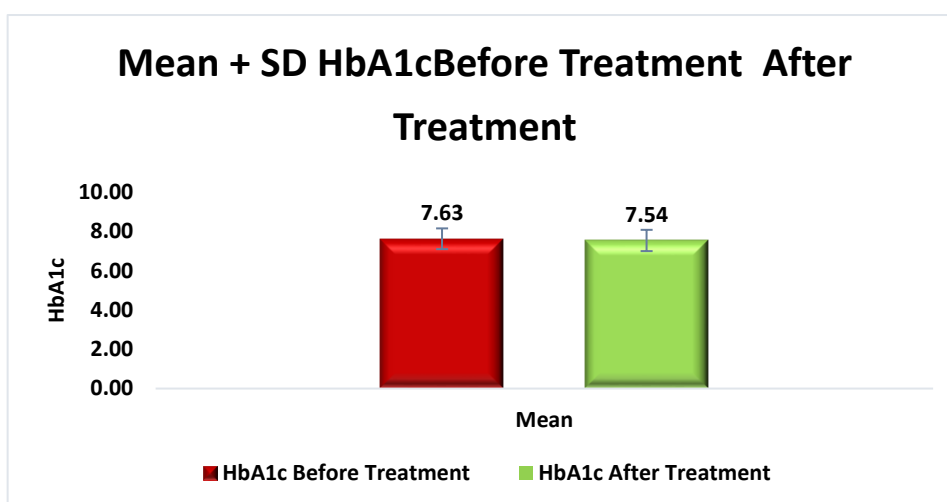


Fig 5: Bar diagram representing the Average \pm SD of HbA1c before and after the intervention.

Table 6 and Fig 4 and 5 show the descriptive statistics of the HbA1c, Fasting- Blood glucose level mg/dl, Pp- Blood glucose level mg/dl before and after the intervention.

Before treatment, HbA1c was 7.62 ± 0.52 (mean \pm SD) which reduces to 7.53 ± 0.54 after treatment.

Before treatment, Fasting- Blood glucose level mg/dl was 144.3 ± 23.08 (mean \pm SD) which reduces to 135.5 ± 19.15 after treatment.

Before treatment, Pp- Blood glucose level mg/dl was 202.2 ± 43.61 (mean \pm SD) which reduces to 190.3 ± 36.34 after treatment.

Additionally, the study measured fasting blood glucose levels before and after the treatment. Prior to the treatment, the average fasting blood glucose level was 144.3 ± 23.08 mg/dl. Following the treatment, there was a significant decrease in fasting blood glucose levels, with the average value decreasing to 135.5 ± 19.15 mg/dl.

Furthermore, the study also analysed postprandial (Pp) blood glucose levels. Before the treatment, the average Pp blood glucose level was 202.2 ± 43.61 mg/dl, and after the treatment, the average value decreased to 190.3 ± 36.34 mg/dl.

Overall, the experimental treatment with medication demonstrated positive outcomes, as evidenced by the significant improvement in 23 out of 30 cases. The treatment resulted in a reduction of both HbA1c levels and blood glucose levels, indicating its potential effectiveness in managing the condition under study. However, further research and larger-scale studies may be necessary to validate and generalize these findings.

DISCUSSION:

Diabetes mellitus type 2 is a metabolic disorder characterized by elevated blood sugar levels (Hyperglycemia) and accompanied by clinical features such as increased thirst (Polydipsia),

excessive urination (Polyuria), and excessive hunger (Polyphagia). It is a sedentary lifestyle disorder, and it is estimated that around 79.4 million individuals in India may be affected by Diabetes Mellitus by the year 2030. The development of Diabetes Mellitus is attributed to impaired insulin secretion and abnormal fat metabolism in obese individuals with a Body Mass Index (BMI) greater than 25Kg/m². Additionally, there is an increased risk of developing DM in people with a family history of the condition and those with reduced physical activity.

Several factors, including stress, excessive alcohol consumption, smoking, and improper nutrition, can also interfere with the recovery from Diabetes Mellitus. These factors are assessed through detailed case-taking, helping to identify obstacles to prognosis. Based on this assessment, a Homeopathic Remedy is prescribed. This study focused on 30 pre-diagnosed and newly diagnosed diabetes mellitus patients, aged between 30 to 75 years (both male and female), from the outpatient department of Bharati Vidyapeeth Deemed University Homoeopathic College & Research Centre, Katraj, Pune. All participants were given the homeopathic mother tincture Cephalandra Indica. The results revealed that out of the 30 cases, 23 showed marked improvement in their condition, while 7 cases did not show a significant improvement in HbA1c levels (>0.5). These findings underscore the specific significance of selecting a medicine with antidiabetic properties, which effectively helps in reducing blood sugar levels.

CONCLUSION:

The homeopathic medicines, particularly mother tinctures, are commonly used and effective in the treatment of type 2 diabetes mellitus. The researcher studied a variety of cases and focused on the specific mother tincture, Cephalandra Indica. In the research, 30 patients with type 2 diabetes completed the study. All these patients were part of the experimental group and received medication using the mother tincture. Out of the 30 patients, 23 showed marked improvement in their HbA1c levels, fasting blood sugar levels, and postprandial blood sugar levels. This indicates a positive therapeutic response to the homeopathic treatment with Cephalandra Indica [12].

Furthermore, it is mentioned that there was no improvement in the remaining 7 cases. While this could raise some concerns, it is essential to remember that not all patients respond the same way to any treatment, be it conventional or alternative medicine. Individual variations, underlying health conditions, and other factors may

play a role in the lack of improvement for those patients. The research findings are significant as they demonstrate that homeopathic mother tinctures, especially Cephalandra Indica, can be beneficial in managing type 2 diabetes mellitus. However, it is essential to interpret these results with caution due to the relatively small sample size and the need for further research to validate the findings. Larger randomized controlled trials and long-term studies would be necessary to establish a stronger evidence base and to generalize the conclusions to a broader population. In conclusion, based on the research results, the claim that homeopathic medicines, specifically mother tinctures like Cephalandra Indica, are effective in the treatment of type 2 diabetes mellitus seems promising. Nonetheless, it is vital for healthcare professionals to approach this conclusion with scientific skepticism and consider it as part of the ongoing research in the field of alternative medicine [13].

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