



TO EVALUATE THE EFFICACY OF GYMNEMA SYLVESTRE MOTHER TINCTURE (Q) IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

A Case Series Study

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Abstract : Background: Type 2 diabetes mellitus (T2DM) is a progressive metabolic disorder in which sustained hyperglycaemia is associated with substantial long-term morbidity. Gymnema sylvestre is traditionally used in diabetes-related conditions and has been investigated for possible effects on glucose metabolism. The present case series evaluated clinical outcomes and changes in glycated haemoglobin (HbA1c) among patients receiving Gymnema sylvestre mother tincture (Q). **Methods:** A prospective observational case series was conducted in institutional and peripheral outpatient settings among 30 patients diagnosed with T2DM. Eligible participants of either sex were followed monthly. Gymnema sylvestre Q was prescribed as the study intervention; conventional antidiabetic treatment, where already prescribed, was continued under medical supervision. Dietary, exercise and lifestyle advice was provided. Baseline and post-treatment HbA1c values and clinical status were documented. Descriptive analysis was performed using Microsoft Excel. **Results:** The largest age group was 51–60 years (36.67%), and 17 participants (56.67%) were male. Mean HbA1c decreased from 7.89% at baseline to 7.56% after treatment, an absolute reduction of 0.33 percentage points (paired t-test, $t(29) = -4.65$, $p < 0.001$). The master chart classified 19 of 30 cases (63.33%) as improved and 11 (36.67%) as not improved. **Conclusion:** The case series documented a favourable clinical and glycaemic trend in a proportion of participants receiving Gymnema sylvestre Q as part of their overall diabetes management. However, the uncontrolled design, small sample, concurrent conventional treatment and lifestyle interventions prevent attribution of the observed changes specifically to Gymnema sylvestre. Larger, controlled and methodologically standardized studies are required.

IndexTerms - Type 2 diabetes mellitus, Gymnema sylvestre, mother tincture, HbA1c, homoeopathy, case series, glycaemic control.

I. INTRODUCTION

Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder characterized by hyperglycaemia resulting from a combination of insulin resistance, progressive pancreatic β -cell dysfunction and inadequate insulin secretion. It is the predominant form of diabetes and represents an important public-health problem because of its increasing prevalence and its association with microvascular and macrovascular complications [1]–[6].

The burden of T2DM has increased with population ageing, urbanisation, dietary transition, obesity and physical inactivity. India carries a substantial diabetes burden, and the disease affects both urban and rural populations [7]–[9]. Long-term glycaemic exposure is associated with diabetic complications, making sustained glycaemic control a central objective of management. HbA1c is particularly useful because it reflects average glycaemic exposure over approximately the preceding 2–3 months [1], [10].

Current diabetes management combines lifestyle modification with pharmacological therapy selected according to glycaemic status, comorbidities and individual patient factors. Metformin, sulfonylureas, incretin-based therapies, sodium-glucose cotransporter-2 inhibitors, glucagon-like peptide-1 receptor agonists and insulin are among established therapeutic options [1], [11]. Nevertheless, long-term diabetes care remains challenging because of progressive disease, treatment burden, adherence issues and the need for continuing monitoring.

Interest in complementary and plant-derived interventions has increased [12], [13]. *Gymnema sylvestre*, traditionally known as Gurmar, contains bioactive constituents including gymnemic acids and has been investigated for potential effects on carbohydrate metabolism. Experimental and clinical literature describes possible actions involving intestinal glucose absorption, insulin secretion, glucose utilization and pancreatic β -cell function [14]–[19].

Within homoeopathic practice, *Gymnema sylvestre* mother tincture is traditionally used in diabetes-associated symptomatology including increased thirst, appetite, urinary frequency and elevated blood glucose [20]–[22]. There is a need for clinical evaluation of this intervention using objective parameters such as HbA1c together with clinical assessment. The present article reports a case series of 30 patients with T2DM receiving *Gymnema sylvestre* mother tincture (Q) and interprets the findings in the context of the study design and its limitations.

II. MATERIALS AND METHODS

A. Study design and setting

The investigation was a prospective observational case series conducted in institutional and peripheral outpatient departments. Thirty patients diagnosed with T2DM were included. The study is reported conservatively as a 30-case observational case series, without random allocation to treatment.

B. Participants

Inclusion criteria were a diagnosis of T2DM, either sex, availability for follow-up and willingness to participate with informed consent. Exclusion criteria included type 1 diabetes, gestational diabetes, secondary diabetes, long-term steroid/immunosuppressant use, severe systemic illness including advanced chronic kidney disease or hepatic failure, and non-cooperation. Withdrawal criteria included unwillingness to continue, development of a condition requiring emergency management, and non-compliance with treatment or follow-up.

C. Intervention and co-interventions

Gymnema sylvestre mother tincture (Q) was used as the study intervention. The case records describe a prescription of 10 drops in half a cup of water, three times daily before meals for one month, with continuation or repetition according to follow-up. Participants were advised on diabetic diet, reduction of refined sugars and sweets, regular physical activity, weight management, blood-glucose monitoring and other lifestyle measures. Several individual case records explicitly document continuation of conventional antidiabetic medication under medical supervision. Consequently, the intervention should be regarded as an adjunctive component of overall management rather than an isolated treatment.

D. Outcome assessment

Clinical symptoms were recorded using a structured case-recording format. HbA1c was assessed at baseline and at the end of the study period. Fasting blood sugar and other clinical observations were recorded during monthly follow-up where available. Outcome assessment was based on HbA1c before and after treatment; no formal quality-of-life scale was used, and no validated quality-of-life outcome is therefore claimed.

E. Data management and analysis

Data were entered and managed using Microsoft Excel. Descriptive statistics were used to summarize age, sex, baseline and post-treatment HbA1c, and the recorded improved/not-improved outcome. Pre- and post-treatment observations were compared using a paired t-test.

III. OBSERVATIONS AND RESULTS

A. Paired comparison

Thirty patients with T2DM receiving *Gymnema sylvestre* mother tincture were assessed before and after treatment. Comparison of the paired observations showed a mean difference of -0.3333 (SD = 0.3925). The paired t-test yielded a t-value of -4.6521 with 29 degrees of freedom and a p-value of 0.00006665 ($p < 0.001$), indicating a statistically significant difference between the pre- and post-treatment observations. The null hypothesis of no difference was therefore rejected. The negative t-value reflects the direction in which the difference was calculated and should not itself be interpreted as a negative clinical effect.

B. Participant characteristics

The largest proportion of participants was in the 51–60-year age group (36.67%), followed by 31–40 years (30.00%) and 41–50 years (23.33%). Participants aged above 60 years constituted 10.00% of the sample (Table 1). Males constituted 56.67% of the sample and females 43.33% (Table 2).

Table 1: Age distribution of participants (N = 30)

Age group (years)	N	%
31–40	9	30.00
41–50	7	23.33
51–60	11	36.67
>60	3	10.00
Total	30	100.00

Table 2: Sex distribution of participants (N = 30)

Sex	N	%
Male	17	56.67
Female	13	43.33
Total	30	100.00

C. Glycaemic outcome

The mean HbA1c decreased by 0.33 percentage points over the observation period (Table 3). Individual master-chart values ranged from 6.50% to 9.80% at baseline and from 6.20% to 9.80% after treatment. The aggregate means are reported as recorded.

Table 3: Mean HbA1c before and after treatment

Parameter	Baseline	Post-treatment	Absolute change
Mean HbA1c (%)	7.89	7.56	-0.33 percentage points

D. Overall recorded outcome

The master chart classified 19 cases (63.33%) as improved and 11 (36.67%) as not improved (Table 4). This case-level classification is used for this article.

Table 4: Overall recorded outcome classification (N = 30)

Outcome classification	N	%
Improved	19	63.33
Not improved	11	36.67
Total	30	100.00

IV. DISCUSSION

This case series documented a reduction in mean HbA1c from 7.89% to 7.56% and a recorded improvement classification in 19 of 30 participants. The findings suggest that a favourable clinical and glycaemic trend occurred during the observation period in a substantial proportion of cases. However, the study design does not permit determination of whether *Gymnema sylvestre* Q itself produced the observed changes.

The demographic pattern was broadly compatible with the recognised increase in T2DM burden with advancing age. The largest group in the present series was 51–60 years, while the study contained participants from 31 years upward. The male predominance observed here should not be interpreted as evidence of a population-level sex difference because the sample was small, outpatient-based and not designed to estimate prevalence.

The reduction in HbA1c is clinically relevant as an objective marker of longer-term glycaemic exposure, but its magnitude should be interpreted cautiously. HbA1c reflects multiple factors, including concurrent antidiabetic medication, dietary behaviour, physical activity, adherence and the natural variation of glycaemia. In this series, conventional treatment was continued in several cases and lifestyle advice was routinely provided. The observed 0.33-percentage-point mean reduction therefore represents the outcome of the overall management context rather than an isolated drug effect.

The paired t-test showed $t(29) = -4.652$, $p < 0.001$, suggesting that the observed change was unlikely to be attributable to random variation alone. However, statistical significance alone does not establish clinical efficacy. As the present investigation was a case series without a control group, factors such as concurrent antidiabetic treatment, dietary modification, lifestyle changes, natural variation in glycaemic parameters and other confounding variables cannot be excluded. The results should therefore be interpreted as preliminary evidence of an association with improvement, rather than proof of a treatment effect.

The normality assessment shown in the study records yielded a p-value of 0.0423, which is below the conventional 0.05 threshold and therefore raises concern regarding the normality assumption for the paired differences. Accordingly, the paired t-test result should be interpreted cautiously. A Wilcoxon signed-rank test would be appropriate as a sensitivity or non-parametric analysis, particularly given the sample size of 30, to determine whether the conclusion remains consistent without relying on the normality assumption.

Baskaran et al. [19] reported antidiabetic effects of *Gymnema sylvestre* leaf extract in patients with diabetes, while subsequent reviews and experimental reports have described potential glucose-lowering and metabolic effects of the plant [14]–[18]. These reports provide biological and clinical rationale for continued investigation but differ substantially from the present case series in preparation, dose, design, population and control of confounding.

Mechanistically, gymnemic acids have been discussed in relation to intestinal glucose absorption, insulin secretion, peripheral glucose utilization and pancreatic β -cell function [14]–[17]. These mechanisms are plausible areas for investigation, but the present clinical study did not measure insulin secretion, β -cell function, glucose absorption or other mechanistic biomarkers. Accordingly, these mechanisms should be regarded as hypotheses derived from prior literature rather than explanations demonstrated by this study.

The individual case records illustrate heterogeneity in response. Some participants showed substantial falls in HbA1c and progressive improvement in fasting blood glucose and symptoms, whereas others showed little or no change. One documented case showed symptomatic improvement without a corresponding HbA1c reduction, demonstrating why subjective clinical response and laboratory outcomes should be reported separately. Conversely, an increase in HbA1c was recorded in at least one case that was still classified as improved, highlighting the need for a prespecified and internally consistent outcome definition in future research.

The study should also not be interpreted as evidence that patients with T2DM should discontinue or replace conventional antidiabetic therapy. Several case records specifically state that conventional treatment was continued, and continued medical supervision, diet, exercise and monitoring are recommended. Any future evaluation of *Gymnema sylvestre* Q should be conducted as an adjunctive intervention unless a rigorously designed comparative study establishes otherwise.

Strengths. A predefined case-recording approach with monthly clinical follow-up was used. HbA1c provided an objective assessment before and after the observation period, alongside clinical observations. The study documented real-world outpatient cases receiving the intervention alongside routine diabetes care, and the detailed case records may be useful for hypothesis generation and for designing future controlled studies.

Limitations. The major limitations are the small sample size ($n = 30$) and single-series design; the absence of an untreated, placebo or active-comparator control group; concurrent conventional antidiabetic medication and lifestyle modification in many cases; potential heterogeneity in disease duration, baseline glycaemic status and adherence; limited standardized outcome assessment and limited inferential analysis; and the absence of

a formal validated quality-of-life scale. These issues limit causal inference and external validity. A future randomized controlled study should prespecify the intervention dose, duration, primary endpoint, concomitant medication rules, adherence assessment, safety monitoring and statistical analysis plan, and should monitor possible interactions with antidiabetic drugs.

V. CONCLUSION

In this 30-patient observational case series, administration of *Gymnema sylvestre* mother tincture (Q) as part of overall diabetes management was associated with a reduction in mean HbA1c from 7.89% to 7.56%, while 19 cases (63.33%) were classified as improved and 11 (36.67%) as not improved in the master chart. The study therefore provides preliminary clinical observations suggesting a potentially favourable adjunctive role.

These findings cannot establish the independent efficacy of *Gymnema sylvestre* Q because the study lacked a control group and participants continued conventional diabetes care and lifestyle measures. The results should consequently be considered hypothesis-generating. Larger randomized controlled studies with standardized methodology, longer follow-up, prespecified outcomes, safety monitoring and appropriate statistical analysis are required before any definitive therapeutic conclusion can be made.

VI. DECLARATIONS

Ethics approval: Clearance was obtained from the clinical ethical committee.

Consent: Written informed consent was obtained from the patients.

Funding: None.

Conflict of interest: None declared.

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