

Case Report

Treatment of Type 2 Diabetes with Ayurveda: A Case Report

¹Deepak Kumar Semwal, ²Ruchi Badoni Semwal, ³Ashutosh Chauhan and ⁴Satyendra Prasad Mishra

¹Department of Phytochemistry, Faculty of Biomedical Sciences, Uttarakhand Ayurved University, Harrawala, Dehradun 248001, India

²Department of Pharmaceutical Sciences, Tshwane University of Technology, Pretoria 0001, South Africa

³Department of Biotechnology, Faculty of Biomedical Sciences, Uttarakhand Ayurved University, Harrawala, Dehradun 248001, India

⁴Uttarakhand Ayurved University, Harrawala, Dehradun 248001, India

Abstract

Background: A 32-year-old woman having earlier history of hyperthyroidism was diagnosed with type 2 diabetes with a random sugar level of 449 mg dL⁻¹. **Methodology:** The doctor prescribed metformin HCl (1000 mg) with vildagliptin (50 mg) twice a day to patient and advised some blood tests including insulin, blood sugar, TSH, etc., after the end of 10 days medication followed by HbA1c test after next 3 days with continuous medication. On the basis of pathology reports, the doctor advised patient to continue with above medication for one more month. **Results:** The above treatment was not found satisfactory for the patient, as there was problem in maintaining the sugar level. However, after starting ayurvedic treatment with madhunashini vati and karela jamun swaras followed by yoga practice and morning walk, the patient started to recover very fast and within one month, she achieved normal blood sugar level. **Conclusion:** The ayurvedic treatment can be considered as most effective because of its ability to control blood sugar level and also having fewer side effects as compared to that of allopathic medicines.

Key words: Ayurvedic medicine, endocrine disorders, genetic factor, hyperglycemia, yoga practice

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Corresponding Author: Deepak Kumar Semwal, Department of Phytochemistry, Faculty of Biomedical Sciences, Uttarakhand Ayurved University, Harrawala, Dehradun 248001, India Tel: +91-9876761502 Fax: +91-135-268-5137

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INTRODUCTION

Diabetes Mellitus (DM) is one of the most leading chronic, heterogeneous and life-threatening diseases and today it has spread to every region of the globe. The prevalence of DM will be 5.4% by the year 2025, with the global diabetic population reaching to 300 million¹. In a diabetic patient, frequent urination, increased hunger and thirst, decreased body weight, blurred vision, itching and tiredness are common symptoms². Diabetes, particularly type 2 is associated with various cardiovascular diseases such as ischemic heart disease and stroke and it is the major cause of non-traumatic blindness and renal failure³. Nowadays, there are a lot of options available to treat type 2 diabetes with the help of various anti-hyperglycemic medications, such as insulin, sulfonylureas and metformin. Although, these drugs have ability to reduce blood sugar level but the recommendation of one class of anti-hyperglycemic agents or a certain combination to treat complications of diabetes is still difficult⁴.

On the other hand, ayurveda, a science of living has ability to treat diabetes in various ways like diet planning, exercise and yoga practice; as good lifestyle, healthy food and exercise will always remain effective in the management of diabetes. Moreover, various ayurvedic herbs like *Eugenia jambolana*, *Gymnema sylvestre*, *Ceasalpinia crista*, *Aegle marmelos*, *Azadirachta indica*, *Curcuma longa* and *Momordica charantia*, and their formulations are effective in the treatment of diabetes without showing any side effect⁵. Herein, a case study is discussed based on the treatment of type 2 diabetes with the help of both allopathic and ayurvedic medicines in which ayurvedic treatment was found more effective.

CASE STUDY

A 32-year-old Indian woman was coincidentally diagnosed with type 2 diabetes (hyperglycemia) around ten months ago with a random sugar level of 449 mg dL⁻¹ as measured by a blood glucose monitoring device (Accu-Chek active, Roche Diagnostics GmbH, Germany). Surprisingly, she did not have any symptom of diabetes except the normal itching on vulva. In the next day observation, the Fasting (F) blood glucose level was found to 390 mg dL⁻¹ and Post Prandial (PP) glucose level was measured to 463 mg dL⁻¹. Immediate after this shocking incidence, she consulted to a senior endocrinologist (a diabetes specialist). Before starting treatment, the doctor asked her about previous medical history and he found that she is a patient of hyperthyroidism and already taking thyroxin (50 mcg day⁻¹ before meal) for the past 4 years. In addition, her mother is type 1 diabetes

patient for the past 15 years. As per doctor's measurement, her weight was 45 kg, height 150 cm, Body Mass Index (BMI) 21, waist 71 cm, hip 86 cm, pulse rate 112 bpm and blood pressure was 120/80 mm Hg. The doctor prescribed vildagliptin (50 mg) and metformin HCl (1000 mg) twice a day for 10 days and advised some blood tests after 10 days medication. The blood tests advised by the doctor were insulin (F/PP), sugar (F/PP), TSH, urea, creatinine, uric acid and phosphorus levels. The doctor also advised to stop rich sugar and carbohydrate containing foods and use the protein rich diet under a limit. Immediate after starting the treatment, she complained of nausea and could not intake proper food. She consulted the doctor again about this problem but doctor told her that this is normal and she has to continue her treatment. She completed her 10 days treatment with very difficult time and went to pathology lab for blood tests as advised by the doctor. The pathology report of the woman is given in Table 1 together with reference values for the tests.

After studying the above report, doctor advised for HbA1c test after next three days with continuing previously prescribed medicines. After 3 days, the HbA1c value was found to 9.9% (a range between 4 and 5.6% is normal, between 5.7 and 6.4% indicates increased risk of diabetes and 6.5 or above indicates diabetes), which confirmed type 2 diabetes in the woman. On the basis of above examinations, the doctor advised to continue with vildagliptin (50 mg) and metformin HCl (1000 mg) twice a day for next 30 days together with thyroxin (50 mcg day⁻¹ before meal). Besides, he also prescribed pioglitazone (7.5 mg twice a day) for 30 days. During this treatment, the woman measured her blood glucose level randomly and found a major fluctuation ranging

Table 1: Laboratory data of the patient with reference values for the tests

Examination	Observed value	Unit	Reference range
Insulin	5.1 (F)	μU mL ⁻¹	2-25 (F)
	10.1 (PP)*		12-82 (PP)*
Blood sugar	120 (F)	mg dL ⁻¹	70-110 (F)
	196 (PP)		70-140 (pp)
Blood urea	18	mg dL ⁻¹	10-50
Serum creatinine	0.8	mg dL ⁻¹	0.7-1.5
Serum calcium	9.7	mg dL ⁻¹	8.7-11
Phosphorus	4.3	mg dL ⁻¹	3.5-5.5
Serum uric acid	4.1	mg dL ⁻¹	2.8-5.7 (Female) 3.8-7 (Male)
Serum cholesterol	161	mg dL ⁻¹	<200
Serum triglycerides	85	mg dL ⁻¹	<150
Serum HDL cholesterol	42	mg dL ⁻¹	32-65
Serum LDL cholesterol	102	mg dL ⁻¹	100-190
Serum VLDL cholesterol	17	mg dL ⁻¹	10-30
TSH	7.3	μU mL ⁻¹	0.5-4.70

*After 2 h of meal, HDL: High density lipoprotein, LDL: Low density lipoprotein, VLDL: Very low density lipoprotein and TSH: Thyroid stimulating hormone

between 110 and 260 mg⁻¹ dL for fasting sugar and between 146-315 mg dL⁻¹ for post-prandial sugar. Moreover, she also lost around 4 kg of her body weight within 36 days of the treatment. Unfortunately, this treatment was not working nicely as there was the problem in maintaining the sugar level. Thereafter, doctor advised to continue this treatment for one more month and if it will still not work he may prescribe insulin injection to manage the sugar level. The woman was nervous because she did not want to use insulin injection and started to search another doctor for her treatment.

Finally, she consulted an ayurvedic practitioner and shared her whole medical history with him. After examining all the reports and earlier prescription, the ayurvedic doctor advised a six months course to treat diabetes in which he prescribed madhunashini vati (two tablets three times a day for first month, one tablet three times a day for next two months and one tablet twice a day for last three months at least half an hour before meal) and karela jamun swaras (25 mL twice a day before meal) and advised mandatory yoga practice for 30 min and morning walk for 60 min daily with continuing thyroxin (50 mcg day⁻¹ before meal). In addition, he advised to take light meal after each three hours rather than taking a heavy diet once and the diet should not contain rich sugar and carbohydrate. Although, upto around 3 weeks no remarkable improvement was noticed but from the beginning of fourth week, sugar level was steady decreased and most of the time was found in normal level. Interestingly, the woman again started to gain her weight. As per doctor's advice, she first reduced the doses of medicine and after six months completely stopped both ayurvedic medicines, however, her practice of yoga and morning walk is still continued. The observation was continued upto three months post-treatment and during this period, her sugar level remained maintain. Now, she is living a normal life but somewhat conscious for her diet, exercise and morning walk which is certainly a better way to remain healthy.

DISCUSSION

There are so many reasons behind diabetes, in which genetic factor is considered to be a most possible cause. Besides, stress, unhealthy lifestyle and imbalanced diet are also the major causes of diabetes⁶. In the present case, genetic factor might be the possible cause of diabetes as woman's mother is also a type 1 diabetes patient and is insulin dependent for the past 15 years. Many previous researches support the role of genetic factor in type 2 diabetes although, an understanding of the genetic basis of type 2 diabetes is limited, because various environmental and genetic

factors influence insulin sensitivity and insulin secretion⁷. Moreover, higher levels of stress can cause the blood glucose to rise, which is supported by various evidence-based studies. High stress in life may affect diabetes in terms of both its onset and its exacerbation through physiological mechanisms and via behavior⁸. In present case, the stress may be the major cause of type 2 diabetes in woman as she was stressful due to over workload of her previous job, which she left finally. Apart from above causes, the role of abnormal thyroid hormones in insulin resistance cannot be overlooked as various evidences indicating the involvement of thyroid hormones with type 2 diabetes because both the conditions are related to dysfunction of the endocrine system⁹. The dysfunction in thyroid hormones might be due to the genetic expression and also due to abnormalities in physiological functions, which leads to reduce glucose utilization, increased splanchnic glucose absorption, overproduced hepatic glucose output and finally to insulin resistance¹⁰. As the woman of the present study had hyperthyroidism, which caused a reduction in glucose metabolism in type 2 diabetes and also associated to insulin resistance. Hence, hyperthyroidism could have responsible factor for diabetes.

The treatment of diabetes is challenging, although its management is possible with the help of medication and improved lifestyle¹¹. The allopathic drugs i.e., vildagliptin, metformin and pioglitazone used to manage type 2 diabetes in the present case were found unsuccessful as woman could not achieved normal blood glucose level even after 45 days of continuous treatment. Hence, there was an urgent need of alternative treatment to control blood sugar level and to avoid possible complications due to type 2 diabetes.

CONCLUSION

Use of ayurvedic medicines i.e., madhunashini vati and karela jamun swaras together with regular yoga practice and morning walk was found effective to control blood sugar. This alternative treatment can be considered as most effective because of its ability to control blood sugar level and also having fewer side effects as compared to that of allopathic medicines.

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REFERENCES

1. Semwal, D.K., U. Rawat, R. Semwal, R. Singh and G.J.P. Singh, 2010. Anti-hyperglycemic effect of 11-hydroxypalmatine, a palmatine derivative from *Stephania glabra* tubers. *J. Asian Nat. Prod. Res.*, 12: 99-105.
2. Bastaki, S., 2005. Diabetes mellitus and its treatment. *Int. J. Diabetes Metab.*, 13: 111-134.
3. Ripsin, C.M., H. Kang and R.J. Urban, 2009. Management of blood glucose in type 2 diabetes mellitus. *Am. Family Physician*, 79: 29-36.
4. Nathan, D.M., J.B. Buse, M.B. Davidson, E. Ferrannini and R.R. Holman *et al.*, 2009. Medical management of hyperglycemia in type 2 diabetes: A consensus algorithm for the initiation and adjustment of therapy: A consensus statement of the American Diabetes Association and the European Association for the Study of Diabetes. *Diabetes Care*, 32: 193-203.
5. Semwal, D.K., A. Bamola and U. Rawat, 2007. Chemical constituents from some antidiabetic plants. *J. Phytochem. Ayurvedic Heights*, 2: 40-48.
6. Cheung, B.M.Y. and C. Li, 2012. Diabetes and hypertension: Is there a common metabolic pathway? *Curr. Atherosclerosis Rep.*, 14: 160-166.
7. Gerich, J.E., 1998. The genetic basis of type 2 diabetes mellitus: Impaired insulin secretion versus impaired insulin sensitivity. *Endocr. Rev.*, 19: 491-503.
8. Lloyd, C., J. Smith and K. Weinger, 2005. Stress and diabetes: A review of the links. *Diabetes Spectr.*, 18: 121-127.
9. Hage, M., M.S. Zantout and S.T. Azar, 2011. Thyroid disorders and diabetes mellitus. *J. Thyroid Res.*, Vol. 2011. 10.4061/2011/439463
10. Wang, C., 2013. The relationship between type 2 diabetes mellitus and related thyroid diseases. *J. Diabetes Res.*, Vol. 2013. 10.1155/2013/390534
11. Coppel, K.J., M. Kataoka, S.M. Williams, A.W. Chisholm, S.M. Vorgers and J.I. Mann, 2010. Nutritional intervention in patients with type 2 diabetes who are hyperglycaemic despite optimised drug treatment-Lifestyle Over and Above Drugs in Diabetes (LOADD) study: Randomised controlled trial. *BMJ*, Vol. 341. 10.1136/bmj.c3337