

Type2 diabetes: Knowledge, attitude, and practice of Ayurveda for management of the disease in Gujarat, India

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Abstract -Background: Diabetes mellitus is most common life-threatening disease worldwide. Despite advances in the management of type 1 and type 2 diabetes, therapeutic targets are often not met People dissatisfied with conventional medicine often turn to nontraditional alternatives like Ayurveda. **Objective:** This study determines awareness and management of type 2 diabetes with Ayurveda by diabetic outpatients of Government Ayurvedic hospital of Surendra Nagar district, Gujarat, India. **Material and method:** Questionnaire based face to face interview is conducted 50 outpatient of the Government Ayurvedic hospital. The data was analyzed to evaluate the patterns of concomitant use of Ayurvedic and conventional anti-diabetic drugs. **Results:** About 96% of diabetic patients were taking herbal formulations concomitantly with conventional anti-diabetic drugs. Although 52% of diabetics were using Ayurveda interventions under the supervision of qualified AYUSH physicians. **Conclusion:** The observations reveal that a majority of the diabetics (96%) were taking one or the other form of herbal preparations along with their conventional anti-diabetic drugs and about 44% among them were using these concomitantly. Thus, generating awareness on good practices of drug use seems to be essential.

Keywords: attitude, Ayurveda, knowledge, management, practice, type 2 diabetes

INTRODUCTION

Health is the level of metabolic efficiency of a living organism. In human beings, it is the ability of individuals or communities to adapt and self-manage when facing physical, mental, or social challenges. In general, the circumstance in which an individual lives are of great importance for both his or her health status and quality of the life. It is increasingly recognized that health is maintained and improved not only through the advancement and application of health science but also through the efforts and intelligent lifestyle choices

of the individual and society. With radical changes in lifestyle, dietetic habits, increased industrialization, the global population is getting affected with various kinds of non-communicable diseases (NCDs) that represent a leading threat to human health. In the current scenario, NCDs are posing as the world's biggest killers, causing 63% of total deaths.[2] Among such NCDs, diabetes mellitus (DM) is an important entity and India heads the world with over 32 million diabetic patients and this number is projected to increase to 79.4 million by the year 2030,[3] earning the dubious distinction of the diabetes capital of the world. Current surveys indicate that diabetes now affects a staggering 10%-16% of the urban population and 5%-8% of the rural population in India. [4,5] With this increasing incidence worldwide, DM is likely to continue to be a leading cause of morbidity and mortality in the near future. Since inception, modern medical science is depended on synthetic or isolated extracts for the treatment of various pathologies including DM. However, long-term use of such conventional drugs tends to cause damage and may manifest in drug dependency, adverse effects etc. [6] Thus, researchers and policy makers are enthusiastically looking towards traditional systems of medicines for remedial measures. Ayurveda, utilizes natural substances in the form of herbs, minerals, metals and other animal byproducts in the treatment. Herbs are predominantly used in this science since the initial days of humanity for medical purposes and form the origin of much of modern pharmacotherapy. Herbal medicinal products have immensely contributed in global health care. In the past one to two decades, they have gained the attraction of researchers and drug-regulating authorities and became popular because of various reasons.[7]

Although limited information about patterns of concomitant use of traditional and conventional anti-

diabetic drugs is available in the Indian scenario. Hence study planned with KAP model (Knowledge, Attitude, Practice) for potential of ayurvedic formulation for management of type2 diabetes outpatients of government Ayurvedic hospital linked with conventional medicine.

MATERIALS AND METHODS

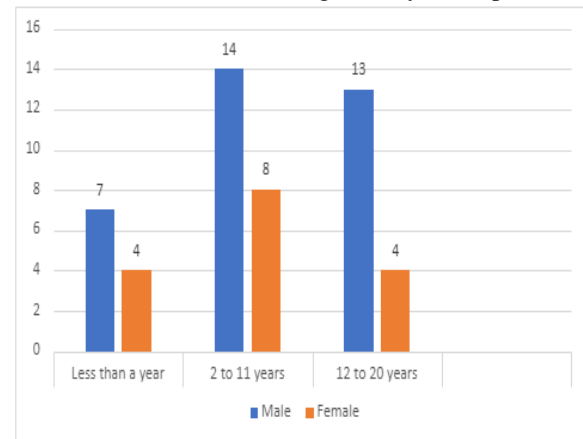
This was a questionnaire-based face to face interview was carried out in an outpatient department of a tertiary care teaching hospital catering to the health needs of the city. The study was conducted from three months, March 2021 to May 2021. Diabetes of both sexes of all age groups attending the outpatient department of the hospital during the study period were involved in the study after having consent to participate. They were informed about the purpose of the study in the local language (Gujarati). A questionnaire involving demographic data and 15 questions consisting about the diabetic history, associated conditions, brief details of drugs being used, modification in diet, life style, source of drugs being procured etc., was used. It was prepared with few close-ended and a few open-ended questions. For content validation, the questionnaire was shared with various stakeholders of Ayurveda. Based upon the inputs, the questionnaire was refined. The final version of the questionnaire was used for the study.

The questionnaire was filled in either by participants or by the investigator by asking questions to the illiterate patients. The questionnaire included information regarding socio-demographic data, present clinical condition, diabetic history, associated conditions, brief details of drugs being used, changes made in lifestyle, conventional anti-diabetic drugs being used, details on concomitant uses of other formulations (particularly Ayurveda), their source of procurement, and participant's knowledge about the possibility of drug interactions. Majority of the conventional drugs were prescribed by their brand names.

RESULTS

Total 50 patient of diabetes were included for this study. Out of them 28(56%) were females. Majority of the diabetes were found to be from the age group of 50-69 years (62%), followed by 29-49 years (24%) and 70-above (14%). No positive family history of

diabetes was observed in 58% of diabetes patients. About 44% diabetics (n=22) had chronicity of 2 to 10 years, while about 34% diabetics(n=17) had chronicity of 12 to 20 years. [Graph1], the 22% (n=11) of newly diagnosed (within a year) diabetes are also found to be taking some Ayurveda intervention. About 48% of the diabetes patients (24 patients) reported using metformin for the diabetes management, while 22% (11 patients) were on glipizide. The rest of the diabetes patients were prescribed with drugs such as sitagliptin, glimepiride by their attending physicians. Anti-hypertensive, anti-hyperlipidemic drugs and other combinations were also being used by a few patients.

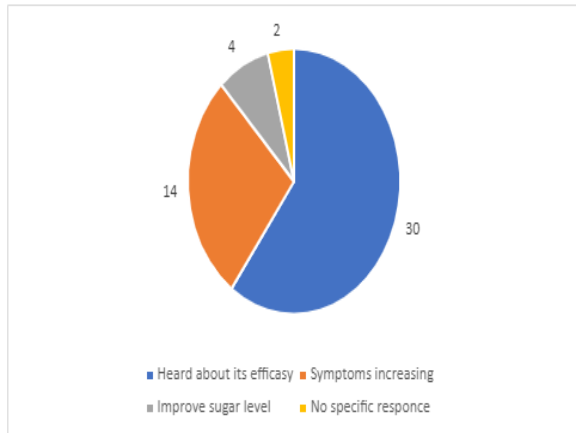


Graph 1: Chronicity of the studied diabetes

Most of the studied diabetes patients (74%) were aware about the importance of diet and diabetes restrictions. About 60% of diabetes patients made some modifications in their lifestyle and added walking, while a section of patients (8%) added Yoga and Pranayama into their lifestyle. However, around 48% of the population was unable to modify their lifestyle considering reasons related with occupation, lacking of information. The study also revealed that 94% of diabetes patients were taking one or the other form of herb or herbal formulations or other AYUSH preparations or self-made home remedies along with their conventional anti-diabetes drugs.

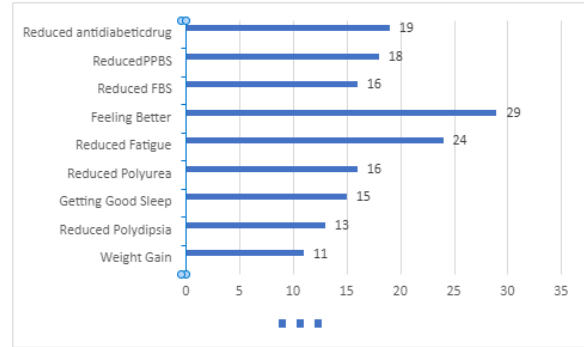
The 60% diabetes patients (n =30) have heard about the usefulness of traditional practices. About 14 diabetes patients (28%) approached traditional physicians as the symptoms of diabetes were not managed with conventional management. [Graph 2] It is observed that no patient was referred by their attending conventional physicians to traditional practitioners for the possibility of traditional interventions.

Although 52% of diabetics were using traditional interventions under the supervision of qualified AYUSH physicians; it is alarming to observe that 44% of the surveyed diabetics were procuring the herbal material from the local vendors without consulting or informing to their physicians. About 4% diabetics were purchasing the Ayurvedic formulations over the counter (OTC). Importantly, the addition of Ayurvedic formulations in the diabetes management was not communicated by the diabetes patients with their health-care providers that may put the consumers at risk.



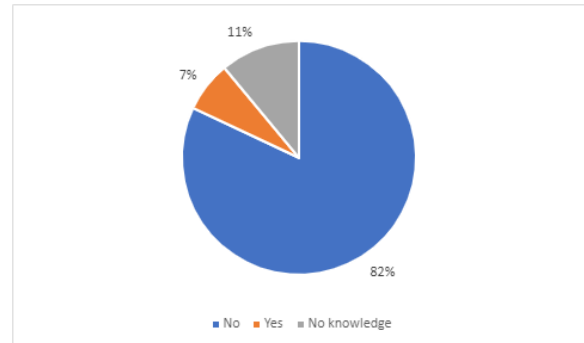
Graph 2: Reasons to start Ayurveda interventions (n=50)

A large number of medicinal plants are believed to possess anti-diabetic properties and are being utilized to manage diabetes. After adding Ayurvedic interventions into the management, 18 diabetes patients (36%) mentioned that the dose of conventional antidiabetic drugs was reduced by their physician. Clinical profile of diabetes patients in this study found quite modify after the intervention. About 38% (19) diabetic patients PPBS reading shows improvement of sugar, while 32% (16) of diabetic patients FBS reading show improvement of sugar. Around 58% of the studied diabetics (29) reported a feeling of betterment in their routine activities after the addition of Ayurveda interventions, 48% (24) reported reduction in levels of fatigue, reduction in polyuria by 16 diabetes patients (33%), polydipsia by 13 diabetes patients (26%), reduced symptoms associated with urinary tract infection by 6 (12%), Improved quality of sleep was reported by 15 (30%) diabetes patients.



Graph 3: Positive changes noticed in number of diabetes after using Ayurvedic formulations

Around 56% of diabetes patients were concomitantly using Ayurvedic formulations with prescribed conventional anti-diabetic drugs, while 22% of diabetes patients never observed about the timings of the drug consumption. Although the reason is unknown, 34% of diabetes patients were observing a gap in between the use of conventional and traditional formulations. About 82% (n = 41) of the surveyed diabetes patients were unaware about the possibility of herb-drug interactions [Graph 4]



Graph 4: Knowledge about herb-drug interactions in the studied diabetes patients

DISCUSSION

Out of 50 studied diabetes patients, 28 (56%) were females. There is no considerable difference by gender in the prevalence of DM. The prevalence of DM among men was not significantly different from that among women.[8] Majority of the diabetics were found to be in between 41 and 60 years. This data supports the fact that the individuals aged between 45 and 64 years were the most diagnosed age group for diabetes.[9] Although majority (58%) of the diabetes patients under the study were with negative history, diabetes in the families is not only a risk factor for the disease but is also positively associated with risk

awareness and risk-reducing behaviors. It may provide a useful screening tool for the detection and prevention of diabetes.[10] Family history can be used not only to assess disease risk but also to examine the awareness of the risk and motivation to engage in risk-reducing behaviors.

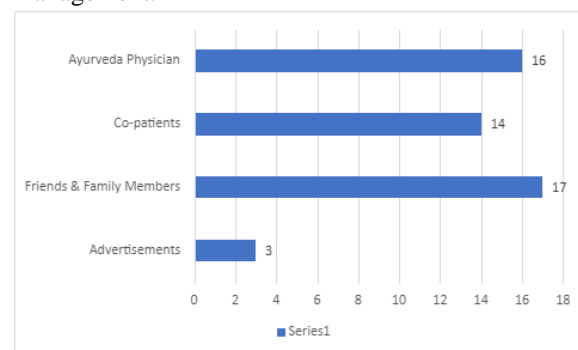
The role of diet in the etiology and management of diabetes is well established. Majority of the studied diabetes patients (74%) were aware about the importance of diet and lifestyle in diabetes management. These diabetes patients modified their diet avoiding rice, potatoes, sugars, sweets, bananas, mangoes, milk, milk derivatives, curd, fruit juices, junk food, street food and all other fruits that are sweet and rich in carbohydrates to suit the management of diabetes. This data is matching with earlier surveys.[11] Reinforcement of education including dietary management through health-care providers becomes essential in understanding about the importance of disease management for appropriate self-care and better quality of life.[12]

Significant association between physical inactivity and diabetes is well established.[13] Evidences suggest that lifestyle changes such as exercise, diet, and other non-pharmacological interventions can delay and even prevent the development of type 2-diabetes.[14] About 60% of diabetics attempted on modifying the lifestyle and added walking in their daily life. A section of diabetes patients (8%) added Yoga and Pranayama into their lifestyle. Yoga practice is useful in the management of diabetes. Psycho-neuro-endocrine and immune mechanisms are involved in the beneficial effects of Yoga on diabetes. Incorporation of Yoga practice in daily life helps to attain glycemic control and reduces the risk of complications in people with diabetes.[15] The remaining diabetics (48%) were unable to modify their lifestyle because of various reasons.

The observations reveal that a maximum (96%) of the studied diabetes patients were taking one or the other form of herb or herbal formulation or other Ayurveda preparations or self-made home remedies along with their conventional anti-diabetic drugs. Earlier studies report that up-to 72.8% of people with diabetes use herbal medicine, involve dietary supplements besides the routine management.[16] The global use of complementary and alternative medicine (CAM) for the management of diseases such as diabetes has reported to be rapidly increased over the last

decade.[16] The observations of the current study also in lines of this finding. Furthermore, researches also indicate that most people who use traditional therapies do so in addition to, rather than in place of conventional medicine. Friends and family members are the main source of information on the usefulness of traditional medicines in diabetic management. Co-patients and advertisements also played a role in this [Graph 5].

Maximum of the diabetes patients (62%) in the current study have heard about the usefulness of traditional practices in the management of diabetes. Friends, family members (34%), and co-patients (28%) are the major sources of information toward knowing the usefulness of traditional practices in diabetes management. Ayurveda physicians (16%) and advertisements (6%) were the other sources of information. Around 28% of diabetics started approaching traditional physicians as the symptoms were unable to be managed with conventional management.



Graph 5: Source of knowledge in number of studied diabetes patients on Ayurveda formulations

An increasing number of medicinal plants are being used to treat diabetes and its related conditions. Many of these plants have been used ethno pharmacologically in traditional medicine as anti-diabetics, particularly for type 2-diabetes.[17] The frequently using drugs were enlisted. About 32% of diabetes patients were using poly herbal formulation consist Guduchi (*Tinospora cordifolia* (Thunb.) Miers.) Amalaki (*Phyllanthus emblica* Linn.), Vijayasara (*Pterocarpus marsupium* Roxburgh.), Mamajjaka (*Encostemma littorale* Auct. non Bl) Ghanavati. Remaining diabetes patients were using Arjuna (*Terminalia arjuna* Roxb.) Wight and Arn.), Ashwagandha (*Withania somnifera* Linn.), Bilva (*Aegle marmelos* Linn.), Haridra (*Curcuma longa* Linn.), Indrayava (*Holarrhena antidysenterica* Linn.),

Karavellaka (*Momordica charantia* Linn.), Katuki (*Picrorhiza kurroa* Royle ex Benth.), Methika (*Trigonella foenum graecum* Linn.), Musta (*Cyperus rotundus* Linn.), Nimba (*Azadirachta indica* Linn.), Vijayasara (*Pterocarpus marsupium* Roxburgh.) and Yashtimadhu (*Glycyrrhiza glabra* Linn.). Jambu Beeja (seeds of *Syzygium cumini* [L.] Skeels.), The classical literature of Ayurveda credited anti-diabetic values to these drugs and recent researches substantiated the role of herbal drugs in the management of different phases of diabetes.[18-33] The underlying anti-diabetic effects of these herbs may be because of one or the other types of the mechanism involving a direct effect on insulin secretion, activation of glycogenesis and hepatic glycolysis, adreno-mimeticism, pancreatic beta-cell potassium channel blocker activity, cAMP activation, and/or modulation of glucose absorption from the intestine, etc.

After adding traditional interventions, 36% of diabetes patients mentioned that the dose of conventional antidiabetic drugs was reduced by their physician. A feeling of betterment, improved alertness, reduced levels of fatigue, reduction in other diabetes symptoms including polyuria, polydipsia, improved sleep quality infers that the traditional formulations are possibly interfering some of the pathways of diabetes pathology and helping in diabetes management. Formulations with antioxidant properties will be beneficial in diabetes management to counter free radical-induced diabetes and its complications. Various forms of alkaloids and other functional groups present in the herbs and herbal formulations can exert antioxidant activity and thus help in the diabetes management.

CONCLUSION

It is well recognized that there is a worldwide increase in the use of traditional medicinal products. Unlike conventional medicines, where the ingredients are precise and identify; traditional medicinal products contain multiple bio-active components for which there is a lack of knowledge of how these components interact with each other and with pharmaceutical medicines when they are used in combination. Although many studies regarding the possibility of herbal components beneficially enhancing anti-diabetic action may also exist. The study revealed that a majority of the diabetics (96%) were taking one or the other form of herbal preparations along with their

conventional anti-diabetic drugs. This pattern infers that the use of any medicine should mandatorily be under the supervision of their respective physicians. Though, no significant interactions were noticed in the current study; generating awareness on good practices of drug use seems to be an essential component. All stakeholders of the country including drug regulating authorities can play a crucial role in this direction to frame regulations to curb self-prescribing practices and generate awareness on good practices of drug use.

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Conflicts of interest

There are no conflicts of interest.

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