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Use of complementary and alternative medicine in Type 2 Diabetes in Eastern Nepal

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Abstract

Background: The chronic and progressive nature of Diabetes Mellitus often leads people to use complementary and alternative medicines (CAMs) which may be defined as a group of medical and health care systems, practices and products that are not considered to be part of conventional medicine. **Methods:** This descriptive cross-sectional study was done in a tertiary care hospital in Eastern Nepal from 15th June 2018 to 15th September 2019 to determine proportion of type 2 diabetic patients who have triedcomplementary and alternative medicines (CAMs) exclusively prior to presentation to endocrine OPD (Outpatient department).Consecutive sampling was done after informed verbal consent. **Results:** Out of 401 participants, 60.6 percent were male and 39.4 percent were female. Mean age of participants was 52.21 ± 11.42 years. Regarding use of CAMs, 11 percent sad tried some form of CAMs exclusively without any allopathic antidiabetic medicines for some period in their lifetime prior to presentation to endocrine OPD. More specifically, 10.3 percent had tried products under brand of ayurvedic medicines from local practitioners. Similarly, 0.2 percent had tried medicine from Homeopathic Practitioner and rest (0.5 percent) had tried homemade herbal remedies like garlic, fenugreek, aloe vera and bitter melon. **Conclusion:** A significant proportion of type 2 diabetics in our community are still using CAMs. The associated factors behind this and long term effects of such products in diabetic patients need to be explored further in details.

Key words: Complementary and Alternative medicines (CAMs), Type 2 Diabetes

Introduction

Diabetes Mellitus is one of the most common metabolic disorders in the world and the prevalence of diabetes in adults is increasing in last few decades. An estimated 463 million adults aged 20-79 years are currently living with diabetes which represents 9.3 percent of the world's population in this age group. This number is predicted to rise to 578 million (10.2%) by 2030 and to 700 million (10.9%) by 2045. In 2019, the number of deaths resulting from diabetes and its complications is estimated to be 4.2 million. It is estimated that 79.4 percent of total people with diabetes live in low and middle income countries.[1]

The chronic and progressive nature of the disease often leads people to use complementary and alternative medicines. The National Centre for Complementary and Alternative Medicine of the United States defines CAM as "a group of medical and health care systems, practices and products that are not considered to be part of conventional medicine".CAMs include herbal remedies and other forms of therapy like acupuncture, faith healer, massage therapy, hypnosis and music therapy. [2]

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In a 2008 position statement, the American Diabetes Association (ADA) stated that there is insufficient evidence to demonstrate the efficacy of supplements in diabetes management and recognized the lack of standardization among preparations.[3] The botanical products that are commonly used for patients with diabetes and that clinicians may encounter in clinical practice are as follows[4]

Table 1. Selected Biologically Based Practices Used for Diabetes

Name	Hypothesized Effect(s) on Glucose Metabolism	Potential Adverse Effects
Allium sativum (garlic)	Insulin secretagogue	Blood thinning (To use with caution with anticoagulation or antiplatelet medications)
Aloe vera	Insulin secretagogue	Abdominal pain, diarrhea from laxative component, with subsequent electrolyte depletion
Cocciniaindica (ivy gourd)	Insulin mimetic	None reported
Gymnemasylvestre (gymnema)	Insulin secretagogue	Suppression of sweet taste
Momordicacharantia (bitter melon)	Insulin mimetic Decreased hepatic glucose production	Glucose 6 phosphate deficiency Contraindicated in pregnancy
Opuntiastreptacantha (prickly pear cactus, nopal) Panex ginseng, P. quiquefolius (ginseng)	Decreased carbohydrate absorption coagulation and anti Insulin mimetic Alters hepatic glucose metabolism	Diarrhea, nausea, abdominal fullness May interfere with effect of anti-coagulation and anti-platelet medications Estrogenic effect with breast tenderness, amenorrhea, vaginal bleeding, impotence Hypertension Insomnia
Trigonellafoenumgraecum (fenugreek)	Insulin secretagogue Decreased carbohydrate absorption	Gas, bloating, diarrhea Contraindicated in pregnancy

Around 25% to 57% of people with diabetes have been reported using complementary or alternative medicine worldwide.[5] This figure is even higher in developing countries where more than 70% of populations still depend on the complementary and alternative systems of medicine.[6]

Nepal is also one of the developing country having population of 28,981,469 (0.37% of the total world population) with only 21.4 percent population living in urban areas. There are three main domains of non conventional medicinal practices commonly available in Nepal. They are i) Scholarly Medical systems which includes Ayurveda, Homeopathy, Tibetan and Unani medicine ii) Folk medicines and iii) Shamanistic medicine (Faith healing system) that includes four different types of faith healing namely a) Dhami-jhankri, b) Jharphuke, c) Pandit-Lama-Pujari-Gubhaju and d) Jyotish.[7]

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Some previous studies carried out in Nepal have shown that more than 50 percent of the population use CAM for various diseases because of culture, lack of health facility and expensiveness of modern allopathic medicine which are common in both the rural and urban areas of Nepal.[8]

In Nepal, no any studies were found till date on the prevalence of exclusive use of CAMs in diabetic population specifically. Hence, this study was designed to investigate the proportion and demographic profile of diabetic population who have tried CAMsexclusively with purpose to control or cure diabetesprior to date of presentation in endocrine OPD (Out Patient Department) of a tertiary care hospital in Eastern Nepal.

Objective

To determine the proportion of type 2 diabetic patients who have tried complementary and alternative medicines (CAMs) exclusively prior to presentation to Endocrine OPD of tertiary care hospital.

Materials and Methods

Study design: Descriptive cross sectional study
Settings:Endocrine OPD of Koshi Hospital, Biratnagar; a tertiary care Hospital of Eastern Nepal

Outcomes

outcome: Percentage of type 2 diabetic patients who have tried complementary and alternative medicines (CAMs) prior to presentation to endocrine OPD ofKoshi Hospital.

Sample size: Sample size was calculated using the formula n =z2pq/l2 on the basis of similar study on prevalence of CAM users among type 2 diabetics by N. Vishnu, G. K. Mini and K. R. Thankappan(9) which showed the 39 percent prevalence of use of CAMs in diabetes. The calculated sample size was 401 assuming 10 percent contingency error.

Inclusion criteria: Type 2 diabetes patients 18 years or older visiting Endocrine OPD during the period of 15th June 2018 to 15th September2019 who have voluntarily consented for participation.

Data collection and analysis:Data collection instrument was developed by the researchers around the objectives of the study and to suit the Nepali environment through robust review of literature on previous studies on CAM use in diabetes. Expert comments were obtained by the experts who were involved in diabetic treatment and research. The questionnaire comprised socio-demographic variables, duration of diabetes, co-morbidities, use of CAM sand types of CAM.

Operationally, adult patients were classified based on their age into young adults who were aged less than 60 years and elderly patients who were aged 60 years and more.Consent (verbal) was obtained from the participants.The data were analyzed by using SPSS version 16 software. Categorical variables were described by frequencies and percentages. Chi-square test was used to test any significant association between categorical variables. In all cases, $P < 0.05$ was considered statistically significant. Odds ratio (OR) which is an indicator of degree of association of exclusive use of CAM events with a predictor variable was estimated at 95 percent confidence limit.

Results

Four hundred and one patients were included in our study out of which 60.6 percent were male and 39.4 percent were female. Mean age of participants was 52.21 ± 11.42 years. Elderly population ($\geq$60 years) occupied 28.2 percent. Out of total study population, 83.8 percent had received some level of formal education in life. Similarly, 57.4 percent had Diabetes of less than 5 years duration,18.2 percent had of 5 to 10 years and rest (24.4%) had of $\geq$ 10 years. Understanding of disease itself was good in 48.4 percent while only fair in 35.9 percent and rest (15.7%) had poor understanding of the disease. Regarding comorbidities, 39.9 percent had Hypertension, 5.2 percent had Ischemic heart Disease and 4.5 % had Chronic Kidney Disease.

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Table 2: Background characteristics of Type 2 Diabetes Mellitus patients

Background characteristic	Number	Percentage
Age		
≥60 years	113	28.2.
<60 years	288	71.8
Sex		
Male	243	60.6
Female	158	39.4
Education		
Literate	336	83.8
Illiterate	65	16.2
Duration of Diabetes in years		
≥10 years	303	75.6
<10 years	98	24.4
Awareness of complications of diabetes		
Yes	188	46.9
No	213	53.1
Complete adherence to treatment		
Yes	55	13.7
No	346	86.3
Comorbidities		
Hypertension	160	39.9
Heart disease (IHD/CHF)	21	5.2
Chronic kidney disease	18	4.5
Complications of Diabetes		
Retinopathy	62	15.5
Peripheral neuropathy	112	27.9
Sexual problems	19	4.7

Only 13.7 percent of total population was strictly compliant to treatment while rest 86.3 percent had lost adherence in some moment of life. Out of total study population, 11.5 percent were on insulin at home. Similarly 23.6 percent were using one oral antidiabetic drug, 68.1 percent were using more than one antidiabetic drugs and 8.3 percent were on only diet and lifestyle modification.

Regarding complications, 46.9 percent were aware of macro and micro-vascular complications. Out of total patients, diabetes related ophthalmological complications were found in 15.5 percent and similarly neuropathy related problems in 27.9 percent, sexual problems in 4.7 percent and dental problems in 6.2 percent patients.

Table 3: Percentage of exclusive CAMs use and types of CAMs used

Variable	Number	Percentage
Exclusive use of CAMs for some period in their lifetime	44	11
Use of unregistered products as CAMs from local non-licensed practitioners	41	10.3
Use of homeopathic medicines as CAMs	1	0.2
Use of homemade remedies like garlic fenugreek, aloe vera juice etc as CAMs	2	0.5

Regarding use of CAM, 11 percent had tried some form of CAM. Specifically, 10.3 percent had tried medicine from local practitioner without authorized license to practice, 0.2 percent had tried medicine from Homeopathic Practitioner and rest (0.5 percent) had tried homemade herbal remedies like garlic, fenugreek, aloe vera and bitter melon.

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Table 4: Percentage of exclusive CAMs use by background characteristics in Type 2 Diabetes Mellitus patients

Background characteristic	CAMs users (percentage)	Non CAMs users (percentage)	p value
Age			
≥ 60 years	10.6	89.4	
< 60 years	11.1	88.9	.887
Sex			
Male	10.7	89.3	
Female	11.4	88.6	.82
Education			
Literate	11.6	88.4	
Illiterate	7.7	92.3	.355
Duration of Diabetes in years			
≥ 10 years	10.2	89.8	
< 10 years	11.2	88.7	.779
Family history of diabetes			
Yes	12.6	87.4	
No	9.1	90.9	.26
Understanding of nature of disease itself			
Good /Fair	11.5	88.5	
Poor	7.9	92.1	.401
Awareness of complications			
Yes	12.2	87.8	
No	9.9	90.1	.448
COMORBIDITIES			
Hypertension			
Yes	10.8	89.2	
No	11.1	88.9	.945
Heart disease (IHD/CCF)			
Yes	0	100	
No	11.6	88.4	.098
Chronic Kidney Disease			
Yes	11.1	88.9	
No	11	89	.985

IHD: ischemic Heart Disease, CCF: Congestive cardiac failure

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Discussion

This study identifies percentage of type 2 diabetics who have tried complementary and alternative medicines (CAMs) exclusively since diagnosis of their disease prior to presentation to endocrine OPD in 401 ambulatory type 2 diabetes patients .We didn't find any study conducted in Nepalese diabetic patients on use of CAMs till date. Many patients prefer to use alternative medicine and inevitably this interest has an effect on theoretical and clinical applications of medicine. The global rate of prevalence of use of alternative medicine by diabetic patients varies from 17-28 percent.[9,10] Percentageof patients who reported using exclusive CAMs for diabetes was 11 percent in our study which was comparable to prevalence of 9 percent reported in a similar study conducted in Kerala, India by N Vishnu and his team.[11] We did not find any other similar studies intended for studying proportion of exclusive use of CAM by diabetics though studies on use of CAM alongwith allopathic medicines have shown various results from different countries – 35.5 percent in Malaysia[9], 41 percent in Turkey[10] and 18.4 percent (Japan)[12] . The global rate of diabetic patients using alternative medicine products alongwith or without modern medicines varies from 17 to 72.8 percent.[13, 14]

Regarding the types of CAM used by participants in our study, 10.3 percent had tried medicine in the form of dust and pellets that were sold to them from local herbal shops and practitioners. They try to attract the patients with advertisement through various popular media in society like radio, television and newspapers claiming of guaranteed cure of the disease without any side effects and sell these substances to patients in the name of ayurvedic medicines. Similarly 0.2 percent had tried medicine from Homeopathic Practitioner and rest (0.5 percent) had tried homemade herbal remedies like garlic, fenugreek, bitter gourd and cinnamon. Analysis of current trends also indicates that bitter gourd and cinnamon are used most frequently worldwide, but there is a broad spectrum of herbal products in use that varies greatly between countries.15-16[15,16]All of these patients had to visit hospital or clinic for conventional anti diabetic medicines when they found that their blood sugar was not being controlled by use of these CAMs alone. Some of these patients were also using CAMs alongwith conventional medicines but our objective was only to measure percentage of those type 2 diabetics who were using CAMs exclusively either stopping their conventional medicines or were using such products exclusively after diagnosis of their disease.

Female gender, high income, monthly blood glucose tests, birthplace, education level, and living with immediate family are common demographic characteristics of patients who have a preference for alternative medicine products, according to international data.[10,13] But in this study, the patient characteristics like age, gender, duration of diabetes, positive family history,literacy status, level of understanding of the disease and level of awareness of complications of diabetes itselfdid not seem to be relevant to use of alternative medicine, nor did presence of any comorbid illness or complications create significant difference. This suggests that progression, severity of the disease, and complications developed are not meaningful factors in patients' choice to use complementary and alternative medicine products.

Strength

The strength of our study includes the relatively large sample of 401 enrollments, which provides adequate representation of diabetic population to study proportion of exclusive CAMs users among them.

Limitations of the study:

1. It is limited to only one centre and hence data may not be representative for diabetics visiting other centers.
2. It is based on self reported data. So, recall bias needs to be considered while interpreting data.
3. It includes only those diabetics who visit endocrine OPDof Koshi Hospital and thus may not be representative for whole diabetic community.

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Conclusion

Life-long treatment of Diabetes Mellitus is a challenge for patients. Living with the disease of diabetes, compliance with dietary therapy, performing regular blood glucose tests, and the compulsory, regular use of antidiabetic drugs can be very demanding. Hence, patients often seek a quick cure, leading many to try alternative medicine. A significant proportion of type 2 diabetics in our community are still using CAMs. The associated factors behind this and long term effects of such products in diabetic patients need to be explored further in details.

Acknowledgement

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