PRINT: ISSN 0970-9274 ONLINE: 2456-6608
J. Hum. Ecol., 22(4): 313-316 (2007)
DOI: 10.31901/24566608.2007/22.04.07

Awareness and Usage of Indigenous Hypoglycemic Plant Materials by Diabetics of North Karnataka

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KEYWORDS Hypoglycemic. Diabetes Mellitus. Indigenous

ABSTRACT. An investigation was under taken with an objective to know the awareness and usage of hypoglycemic plant materials by diabetics of North Karnataka (n=150). A pretested questionnaire was used to collect the data from 30 diabetic subjects each, randomly selected from five zones of North Karnataka. Results revealed that the diabetics of north Karnataka were aware of 20 plant materials used as hypoglycemic substances. The awareness about the use of fenu greek seeds, bitter gourd, bael, neem, curry and periwinkle leaves was common to all the zones. Most of the diabetics had information about hypoglycemic substances through friends, neighbours and literature. The duration of use varied from three months to five years. Majority of diabetics observed benefits such as control of blood sugar (81.33%) and relief from symptoms (7.35%), most of the diabetics perceived no side effects on consuming the hypoglycemic substances (90%), while a few suffered from nausea and constipation.

INTRODUCTION

In India usage of different parts of plants to cure ailments has been in vogue from ancient times. Diabetes mellitus is a disorder that can not be cured but only managed. Many natural plant materials are is use for control of diabetes such as fenugreek and *jambu* seeds, *periwinkle*, *bael* and *tulasi* leaves. Hypoglycemic activity of these plant materials is attributed to constituents such as alkaloids, fibre, phyto-chemicals and pharmacological agents. Sridhar (1987) has reviewed the indigenous anti diabetic substances in use in the treatment of diabetes mellitus. Vasanthamani and Savita (2001) have studied the awareness about hypoglycemic herbs by diabetics in Coimbatore city. Torangatti (1995) and Malagi (2000) have investigated the consumption of indigenous hypoglycemic substances by diabetics of Halayal and Dharwad city respectively. Such indigenous hypoglycemic substances vary form place to place. Very few studies have been conducted in North Karnataka in this direction. So the present study was taken up to know the awareness and usage of indigenous hypoglycemic plant materials for control of diabetes in North Karnataka.

MATERIAL AND METHODS

The study was conducted in North Karnataka region. About five zones were randomly selected from North Karnataka with varied ecological diversity for data collection with a total of 150 subjects. A detailed pretested questionnaire was developed including questions on awareness, consumption pattern and side effects of hypoglycemic plant materials and used for collecting information from the diabetics.

RESULT AND DISCUSSION

General information of subjects (Table 1) revealed that age of onset of diabetes was between 40 to 60 years (74.66%) followed by 30 to 40 years (22%) and above 60 years (3.33%). Majority of diabetics suffered from diabetes for less than 5 years (42%) followed by 5 to 10 years (35.33%). Most of the diabetics were on allopathic drugs. Diabetics of North Karnataka had awareness about 20 plant materials used as hypoglycemic substances (Table 2) out of these, maximum diabetics were aware of fenugreek seeds (57.33%) followed by bitter gourd (36.67%), bael leaves (18%) and tulasi leaves (16.67%). Where as awareness regarding centratherum, Khus grass, ladies finger and snake gourd were found to be low. The practice of herbal medicine dates back to very early periods of known human history in all ancient civilization such as in India, Egypt; China, Greek and Rome. The awareness about the indigenous hypoglycemic substances may be due to acquaintance of people to tra-ditional use of substances and exposure to scientific literature. Similarly diabetics of Coimba-tore were aware of fenugreek seeds, bitter gourd, *jambu* seeds and *kasini* leaves for the control of diabetes. Awareness of hypoglycemic effect of fenu greek

seeds was greater followed by bitter gourd, *jambu* fruit seeds and *kasnini* leaves. The awareness of different plant materials in the present study may be due to different plants grown in North Karnataka and difference in exposure to the knowledge about these plants. (Vasantamani and Savita, 2001).

Most of the diabetics (90.00%) had information about hypoglycemic substances through friends (Table 3) followed by neighbours (62.66%), books and literature (46.66%). Very few diabetics got the information through doctors and other diabetics. In India, the herbal healers, herbal vendors and village elder men and women have traditional knowledge of herbal home remedies and the knowledge is passed from generation to generation. The usage of indigenous hypoglycemic substances is depicted in table 4. The majority of subjects used fenugreek seeds (32%) followed by bitter gourd (17.35%), tulasi and

Table 1: General information of subjects about Diabetes mellitus

Characteristics	*Zones*					
	Dry	*Coastal*	*Hilly*	*transitional*	*North eastern transitional*	*Total*
Age of Onset (years)						
30-40	4 (13.33)	8 (26.67)	5 (16.67)	10 (33.33)	6 (20.00)	33 (22)
40-60	24 (80)	20 (66.66)	25 (83.33)	20 (66.67)	23 (76.67)	112 (74.67)
> 60	2 (6.67)	2 (6.67)	-	-	1 (3.33)	5 (3.33)
Duration (years)						
< 5	9 (30)	7 (23.33)	14 (46.67)	20 (66.66)	13 (43.33)	63 (42)
5-10	12 (40)	12 (40.00)	12 (40.00)	5 (16.67)	12 (40.00)	53 (35.33)
> 10	9 (30)	11 (36.67)	4 (13.33)	5 (16.67)	5 (16.67)	34 (22.67)
Drugs Consumed						
Allopathic	28 (93.34)	27 (90.00)	26 (86.67)	28 (93.34)	28 (93.34)	137 (91.33)
Ayurvedic	1 (3.33)	2 (6.67)	4 (13.33)	1 (3.33)	2 (6.66)	10 (6.67)
Homeopathic	1 (3.33)	1 (3.33)	-	1 (3.33)	-	3 (2.00)

N=30 for each zone
Figures in parenthesis indicate percentage.

Table 2: Distribution of diabetics according to the awareness regarding plant materials used as hypoglycemic agents* (N=150)

S. No.	*Name of the plant material*	*Zones*					
		Dry	*Coastal*	*Hilly*	*Transit.*	*North eastern transit.*	*Total*
1	Aloe vera stem	1 (3.33)	2 (6.67)	2 (6.67)	-	2 (6.67)	7 (4.67)
2	Amla	-	1 (3.33)	6 (20.00)	4 (13.33)	-	11 (7.33)
3	Bael leaves	5 (16.67)	6 (20.00)	6 (20.00)	6 (20.00)	4 (13.33)	27 (18.00)
4	Banyan tree bark	-	1 (3.33)	-	-	2 (6.67)	3 (2.00)
5	Bittergourd	23 (76.66)	9 (30.00)	7 (23.33)	10 (33.33)	6 (20.00)	55 (36.67)
6	Centratherum	1 (3.33)	-	-	-	1 (3.33)	2 (1.33)
7	Curry leaves	4 (13.33)	2 (6.67)	3 (10.00)	3 (10.00)	2 (6.67)	14 (9.33)
8	Drumstick leaves	-	1 (1.33)	2 (6.67)	2 (6.67)	-	5 (3.33)
9	Fenugreek seeds	21 (70.00)	19 (63.33)	16 (53.33)	20 (66.67)	10 (33.33)	86 (57.33)
10	Heart leaved	-	2 (6.67)	1 (3.33)	1 (3.33)	-	4 (2.67)
11	Hibiscus flowers	2 (6.67)	2 (6.67)	-	-	-	4 (2.67)
12 i	Jambu fruits	5 (16.67)	2 (6.67)	2 (6.67)	4 (13.33)	3 (10.00)	16(10.67)
12 ii	Jambu seeds	10 (33.33)	-	1 (3.33)	-	10 (33.33)	21 (14.00)
13	Khus grass roots	-	1 (3.33)	-	-	-	1 (0.67)
14	Ladies finger	-	-	-	1 (3.33)	-	1 (0.67)
15	Madhunasini	1 (3.33)	-	1 (3.33)	1 (3.33)	1 (3.33)	4 (2.67)
16	Neem leaves	7 (23.33)	6 (20.00)	2 (6.67)	3 (10.00)	8 (26.67)	22 (14.67)
17 i	Periwinkle leaves	2 (6.67)	5 (16.67)	3 (10.00)	8 (26.67)	1 (3.33)	19 (12.67)
17 ii	Periwinkle flowers	4 (13.33)	-	-	-	-	4 (2.67)
18	Pomegrante peel	1 (3.33)	-	1 (3.33)	1 (3.33)	-	3 (2.00)
19	Snake gourd	-	-	-	-	1 (3.33)	1 (0.67)
20	Tulasi	2 (6.67)	-	8 (26.67)	10 (33.33)	5 (16.67)	25 (16.67)

Note: Figures in parenthesis indicate percentage n=30 for each zone
* Due to multiple answers percentage is not equal to 100

jambu seeds (8.67%), bael and periwinkle leaves. Torangatti (1995) and Malagi (2000) found that diabetics consumed fenu greek seeds bitter gourd and jambu seeds as hypoglycemic foods in Haliyal and Dharwad respectively. The usage of indigenous substances in the present study may be due to the local availability, awareness of subjects regarding these substances through literature, usage by friends, neighbours and other diabetics. The duration of use of plant materials ranged from 3 months to 5 years. Similarly the mention fenugreek seeds has been made in Ayurvedic literature and is clinically proved (Sarma, 1987 and Chadha et al., 1998). Opinion of diabetics about indigenous hypoglycemic substances (Table 5) showed that most of the diabetics observed benefits such as control of blood sugar (81.33%), and few observed the relief from symptoms (7.33%). Most of the diabetics

Table 3: Source of information about indigenous hypoglycemic substances (N = 150)

S. No.	*Sources of information*	*Frequency*	*Percentage*
1	Friends	135.00	90.00
2	Neighbours	94.00	62.66
3	Other diabetics	14.00	9.33
4	Doctor	21.00	14.00
5	Books & literature	70.00	46.66

Table4: Usage of indigenous hypoglycemic substances by the diabetics+ (N = 150)

S. No.	*Name of the plant material*	*Zones*						*Duration of usage* (range)*
		Dry	*Coastal*	*Hilly*	*Transi-tional*	*Northeastern transitional*	*Total*	
1	Aloe vera stem	1 (3.33)	-	2 (6.67)	-	1 (3.33)	4 (2.27)	3m-3y
2	Amla	-	1 (3.33)	2 (6.67)	1 (3.33)	-	4 (2.27)	3m-3y
3	Bael leaves	1 (3.33)	6 (20.00)	1 (3.33)	2 (6.67)	2 (6.67)	12 (8.00)	3m-3y
4	Bittergourd	9 (30.00)	5 (16.67)	5 (16.67)	5 (16.67)	2 (6.67)	(26 (17.33))	3m-3y
5	Centratherum	1 (3.33)	-	-	-	1 (3.33)	2 (1.33)	5m-3y
6	Curry leaves	2 (6.67)	1 (3.33)	1 (3.33)	-	2 (6.67)	6 (4.00)	6m-3y
7	Drumstick leaves	-	1 (3.33)	-	-	-	1 (0.67)	2y
8	Fenugreek seeds	8 (26.67)	9 (30..)	7 (23.33)	15 (50.00)	9 (30.00)	48 (32.00)	3m-4y
9	Heart leaveds	-	1 (3.33)	1 (3.33)	-	-	2 (1.33)	3m-1y
10	Hibiscus flowers	1 (3.33)	2 (6.67)	-	-	-	3 (2.00)	1y
11 i	Jambu fruits $	5 (16.67)	-	-	-	1 (3.33)	6 (4.00)	1-5y
11 ii	Jambu seeds	6 (20.00)	-	1 (3.33)	-	6 (20.00)	13 (8.67)	6m-5y
12	Khus grass roots	-	1 (3.33)	-	-	-	1 (0.67)	3m
13	Madhunasini	1 (3.33)	-	-	1 (3.33)	-	2 (2.67)	3m-3y
14	Neem leaves	3 (10.00)	-	-	-	1 (3.33)	4 (2.67)	6m-2y
15 i	Periwinkle leaves	1 (3.33)		2 (6.67)	6 (20.00)	-	12 (8.00)	3m-3y
15 ii	Periwinkle flower	1 (3.33)	-	-	-	-	1 (0.67)	1y
16	Pomegranate peel	1 (3.33)	-	-	-	-	1 (0.67)	1y
17	Tulasi	1 (3.33)	-	5 (16.67)	15 (16.67)	2 (6.67)	13 (8.67)	6m-3y

Note: Figures in parenthesis indicate percentage n = 30 for each zone
* m – month, y – year $ = During season
+ Due to multiple answers the percentage is not equal to 100

Table 5: Opinion of the diabetics about indigenous hypoglycemic substance* (N=150)

Benefits observed	*F*	*%*	*Side effects perceived*	*F*	*%*	*Consumption*			
						Stopped		*Continued*	
Control of blood sugar	122.0	81.33	Constipation #	9.0	6.00	9.0	6.00	0.0	0.00
Diabetes symptoms relieved	11.0	7.33	Nausea @	12.0	8.00	4.0	2.67	8.0	5.33
No benefits observed	23.0	15.33	No side effect perceived	135.0	90.0	10.0	6.67	125.0	83.33

* - Due to multiple answers given by the subjects percentage exceeds 100
# - Caused by consumption of fenugreek seeds singly
@ - Due to consumption of periwinkle leaves

perceived no side effects on consuming the hypoglycemic substances (90%) while a few suffered from nausea (12%) and constipation (6%)

There is a strong linkage formed between man and plant, herbal medicines are more compatible and congenial to human body. Hence, undesirable side effects caused by plants are rare. Similarly in the present study no visible side effects were observed in most of the diabetics of North Karnataka. Similarly Shridhar (1987) has reported that very few diabetics had abdominal bloating upon ingestion of fenugreek. Due to the bitter taste and unusual smell of periwinkle leaves and fenu greek seeds few diabetics stopped consumption of these substances in the present study. Thus it can be concluded that about twenty plant materials were used as hypoglycemic agents by diabetics of North Karnataka and most of them observed benefits such as control of blood sugar and perceived no side effects. Most of the diabetics had awareness of these substances through friends, neighbours and literature.

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