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HOW MUCH DO TAMIL PATIENTS WITH DIABETES KNOW ABOUT COMPLICATIONS OF DIABETES? A DESCRIPTIVE STUDY

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ABSTRACT

Introduction: Diabetes mellitus (DM) is a common non-communicable disease (NCD) with numerous short and long term complications. Treatment of diabetes-related complications is costly to the patient and also to the national health structure. The patients who are aware of its complications are more likely to achieve better glycaemic control and to have lesser number of diabetes-related complications. The aim of this study was to assess the knowledge on acute and chronic complications of DM among Tamil patients with type 2 diabetes, attending the medical clinic, Teaching Hospital, Batticaloa, Sri Lanka.

Method: This cross-sectional descriptive study was conducted with a patient sample of 384 Tamil patients with type 2 diabetes. Data was collected using a pre-tested interviewer administered questionnaire.

Results: The overall knowledge score on diabetes complications ranged from 0-79% with a mean of 28.32% (SD± 16.2%). The majority of the patients were aware that uncontrolled DM could lead to lifelong complications affecting different organs of the body. However, 88.3% obtained less than 50% overall knowledge score on diabetes complications. Around 55% of the participants had identified cataract as a major chronic complication of DM. Sixty percent and 53% of the patients were not able to recognize any symptoms of hypoglycaemia and hyperglycaemia respectively.

Conclusion: Knowledge on diabetes complication was very poor among Tamil patients with type 2 diabetes. This highlights the need for better educational programmes on self-awareness on diabetes and related complications in order to reduce the morbidity and mortality pattern of diabetes.

Running title: Knowledge on complications of Diabetes

Keywords: Diabetes mellitus, knowledge, acute and chronic complications.

INTRODUCTION

Diabetes mellitus (DM) is one the commonest non-communicable disease. The prevalence of diabetes is on the rise and its' global prevalence is estimated to increase by 5.4% by the year 2025 from 4% of the year 1995 (1).In South East Asia, 71.4 million people (8.3%) were affected by DM in 2011 and the numbers are expected to rise to 120.9 million (10.2%) by the year 2030 (2). A national survey done in Sri Lanka in 2008 found that the prevalence of diabetes as10.3% (3). Around 1.5 million adults in Sri Lanka suffer from DM and the numbers are expected to rise up to 2.1 million by the year 2030 (4).Thus, the prevalence DM has been increasing progressively over the years (5) even in ourpopulation.

DM is a multisystem disease that has the potential to produce significant morbidity and mortality.Its' lifelong complications are physiologically harmful and affect different organs of the body, costing government and the affected patients (6, 7). Both the microvascular and macrovascular complications are due to the injurious effects of chronic hyperglycemia (8).Disability and premature death are common as a result of cardiovascular and other chronic complications (9).Treatment-related hypoglycemia is also a frequent acute complication that leads to considerable morbidity and mortality especially in elderly (10, 11, 12).

Table 1: Socio-demographic characteristics and the gender differences in the study population

Variable		Male (%)	Female (%)	Total
Gender		151 (39.3%)	233 (60.7%)	384
Age group (years)	30-50	42 (27.8%)	80 (34.4%)	122 (31.8%)
	51-60	36 (23.8%)	77 (33.0%)	113 (29.4%)
	61-70	73 (48.4%)	76 (32.6%)	149 (38.8%)
Educational level	Upto grade 5	54 (35.8%)	107 (45.9%)	161 (41.9%)
	GCE (O/L)	71 (47.0%)	109 (46.8%)	180 (46.9%)
	GCE (A/L)	19 (12.6%)	15 (6.4%)	34 (8.9%)
	Diploma / Gaduate	7 (4.6%)	2 (0.9%)	9 (2.3%)
Monthly income	<5000	56 (31.7%)	155 (71.2%)	222 (57.8%)
(Rupees)	5000 – 9999	25 (16.6%)	33 (14.2%)	58 (15.1%)
	10000 – 14999	31 (20.5%)	18 (7.7%)	49 (12.8%)
	≥15000	39 (25.8%)	16 (6.9%)	55 (14.3%)
Marital status	Married	143 (94.7%)	214 (91.8%)	357 (93.0%)
	Unmarried	6 (4.0%)	5 (2.1%)	11 (2.9%)
	Separated	0	1 (0.5%)	1 (0.3%)
	Divorced	0	5 (2.1%)	5 (1.3%)
	Widowed	2 (1.3%)	8 (2.5%)	10 (2.5%)
Occupation	Employed	87 (57.6%)	35 (15.0%)	122 (31.8%)
	Non-employed	64 (42.4%)	198 (85.0%)	262 (68.2%)
Family history of	Yes	57 (37.7%)	81 (34.8%)	138 (35.9%)
diabetes	No	94 (62.3%)	152 (65.2%)	246 (64.1%)
Duration of diabetes	2 – 4.9	69 (45.7%)	118 (50.6%)	187 (48.7%)
(years)	5 – 10	37 (24.5%)	63 (27.0%)	100 (26.0%)
	>10	45 (29.8%)	52 (22.4%)	97 (25.3%)

Patient empowerment is the key component of managing chronic diseases and it is essential that we sufficiently equipped patients with knowledge on complications of DM (13). Studies have demonstrated that the patients who are knowledgeable about DM and its complications have improved glycemic control and overall outcome (14). Proper knowledge on complications of DM can thus prevent the impending chronic co-morbidities (13) and early detection and correction of predisposing factors prevent the occurrence of further attacks (15). It also improves the compliance to treatment (16).Better knowledge on hypoglycemia would help patients to recognize episodes of hypoglycemia early and to prevent acute life-threatening complications such as hypoglycemic coma (17). After the cessation of the ethnic conflicts in the North and East parts of the country, Batticaloa, a district of the Eastern province, is also experiencing the rapid epidemiological transition that we see in the southern part of Sri Lanka and Diabetes mellitus has become an important public health problem (18). The mortality and morbidity from microvascular disease, hyperlipidaemia and retinopathy are high among Sri Lankan patients with DM(19) and in 2007, hospital deaths due to DM were higher in Batticaloa district was higher compared to other districts of the country (20). However, the knowledge regarding their disease, the complications and the reasons for these differences have not been studied previously. The aim of our studywas to assess the knowledge of acute and chronic complications among patientswith type 2 DM attending the medical clinics of teaching hospital, Batticaloa.

METHOD

This cross-sectional descriptive study was conducted among Tamil patients with type II DM attending the medical clinic, Teaching Hospital, Batticaloa, Sri Lanka. The ethical clearance (ERC No: 627/12) for the study was obtained from Ethic Review Committee, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka.The patients between 30-60 years of agewithType-2 DM for more than 2years and those who were living for more than 2 years in the Batticaloa district were recruited for the study. The patients who refused to give consent, the patients with gestational diabetes mellitus (GDM) and the patients with physical discomfort or

Table 2: Knowledge on complications of diabetes in relation to the gender differences

Diabetes-related complication	Male (%)	Female (%)	Total (%)	P value
Cataract	89 (58.9)	121 (51.9)	210 (54.7)	0.178
Kidney diseases	67 (44.4)	108 (46.4)	175 (45.6)	0.703
Heart diseases (heart attack)	61 (40.4)	94 (40.3)	155 (40.4)	0.992
Neuropathy	38 (25.2)	65 (27.9)	103 (26.8)	0.555
Peripheral vascular diseases	30 (19.9)	50 (21.5)	80 (20.8)	0.708
Stroke	16 (10.6)	34 (14.6)	50 (13.0)	0.256
Coma	12 (7.9)	15 (6.4)	27 (7.0)	0.572
Infection	7 (4.6)	6 (2.6)	13 (3.4)	0.275
Metabolic difficulties	0 (0.0)	4 (1.7)	4 (1.0)	0.106

pain during the clinic attendance where they cannot participate the study were not included.

A total of 384 patients were enrolled in the study**.** Systematic sampling technique was adopted to select the patients using "patient's attendance register". The sampling process commenced by selecting a name randomly from the register and then every 2nd name in the frame, based on sampling interval of the particular day, until the desired sample is obtained. A pre-tested interviewer administered questionnaire (IAQ) was used to collect the data from patients on socio-demographic details, clinical information and the knowledge on acute and chronic complications of DM.

Statistical software SPSS (version 18.0) was used for data entry and analysis. Descriptive statistics was applied to obtain percentage andmeans along with relevant inferential statistics. Mann-Whitney U test was performed to compare the median knowledge score of the complication.

RESULTS

Three hundred and eighty-four (384) patients were interviewed and there were 233 (60.7%) females and 151 (39.3%) males. The mean age of the patient population was 55.45 years (SD ± 11.76 years). Nearly half of participants (46.9 %, n=180) had studied up to Grade 5 to GCE (O/L) and the monthly income was less than 5000 rupees (38 US$) in 57.8% (n=222). About 36% of the participants (n=138) reported to have a positive family history of DM and in 14.6%, the mother was identified as the predominant contributor to the family history. Duration of diabetes range from 2 to 33 years and 187 patients (49%) were having DM for less than 5years (Mean duration of diabetes =7.70 ± 5.61 years). Most ofthe participants (80.2%) reported that they had received health advice only on DM management from Doctor or Nurse at the clinics (Table 1).

Knowledge on complications of diabetes:

The majority of patients (79.7%) are aware of the lifelong complication of uncontrolled diabetes. Cataract was identified as a major complication of our patient population (n=210, 54.7%). Summary on gender differences and complications of DM were shown in table 2.

More than half of the participants (n=203, 52.9%) were not able to recognize any one symptoms of hyperglycemia while 13.2% of them were able to identify 2 or more symptoms of hyperglycemia. Among those who stated hyperglycemic symptoms, tiredness/drowsiness was stated by 24.2% followed by polyuria, increased thirst and altered vision was 20.6%, 9.9% and 5.7% respectively.

35.9% of the participants were knowledgeable in recognizing the symptoms of hypoglycemia while 9.0% of them were aware of 2 or more symptoms of hypoglycemia. From the patients who stated hypoglycemic symptoms, only 14.0% stated sweating as main symptoms of hypoglycemia. Knowledge on symptoms of hypoglycemia among

Table 3: Symptoms of hypoglycaemia stated by the patients

Symptoms	Male (%)	Female (%)	Total (%)	P value
Sweating	22 (14.6)	33 (14.2)	55 (14.3)	0.912
Headache	17 (11.3)	25 (10.7)	42 (10.9)	0.871
Confusion	11 (7.3)	22 (9.4)	33 (8.6)	0.461
Weakness	9 (6.0)	23 (9.9)	32 (8.3)	0.176
Excess hungry	7 (4.6)	4 (1.7)	11 (2.9)	0.094

Table 4: Knowledge on complications of diabetes in relation to the gender differences

Knowledge score (%)	Grade	Males	Females	Total	P value
<50	Poor	132 (87.4%)	207 (88.8%)	339 (88.3%)	0.624
50-75	Moderate	19 (12.6%)	25 (10.8%)	44 (11.4%)	
>75	Severe	0	1 (0.4%)	1 (0.3%)	

participants is shown in table 3.

Knowledge score on complications of diabetes:

The overall knowledge score on diabetes complications ranged from 0-79% with a mean of 28.32% (SD± 16.20%). The majority of them (88.3%) scored less than 50% on the knowledge test, while only 1% of them scored more than 75% and 10% of participants had scored zero marks.There was no statistically significant difference between the mean knowledge scores regarding complications of DM among males and females ($P > 0.05$) (Table 4). However, there was a statistically significant difference between mean knowledge score on complications of DM and the level of education, the family history of DM and first or subsequent visit to the Diabetes Education center ($p < 0.05$).

DISCUSSION

In our study, the majority of the participants knew DM as a serious condition, which could produce lifelong complications. More than half (54.7%) of the participants reported that the cataract as the commonest chronic complication of DM followed by kidney disease (45.6%), heart disease (40.4%) and amputation (20.8%). However, the majority were unaware of the symptoms of hyperglycaemia (53%) and hypoglyaemia (64%). The level of education and having a facility for proper patient education are shown to be positively influencing the level of knowledge regarding the disease and the complications of diabetes.

According to a statement by the American association of clinical Endocrinologists, the cause of compli--cations in both acute and chronic DM is either a lack of understanding with regard to the long and short-term regulation of blood glucose or the refusal of the patients to control the blood glucose levels (21). A study done by Perera et al in 2013 has demonstrated that 90.0% of the study participants knew that DM produces chronic complications (22). In contrast, the study by Mohan et al (2005) in Chennai (India) found that only 40.6% of self-reported diabetic subjects knew that DM could cause complications (23). In another study, only 18% men and 27% women did not know that diabetes could affect other organs of the body and were unable to name a single complication associated with DM (24). It is re-assuring that the majority of our patients understand the gravity and the seriousness of the long complications of diabetes. However, a lot to be done to improve the existing knowledge they have.

So many factors influence the level of understanding of the complications of diabetes and the level of understanding can vary in different communities. In the present study, more than half (54.7%) of the participants reported that the cataract was a most common chronic complication of DM and kidney disease (45.6%), heart disease (40.4%) and amputation (20.8%). There areseveral studies that have shown similar results regarding the potential complications of DM (25, 26). More than half of the patients identified cataract as a complication of DM. However, the knowledge regarding diabetic eye disease was poor.A study done by Hogue et al (2006) in Bangladesh found that only 4.9% oftheir study participants were aware oftheir study participants were aware of diabetic eye disease (26). In contrast to the studies done in South Asia, the majority (92%) of the participants in Moodley et al (2007) study in South Africa had identified blindness as the main complication of DM (13). In most of the studies, the majority of the patients are aware that diabetes can leads to kidney and heart problems (27, 28). In contrast, only 45.6% of our study patients aware that diabetes affects the kidneys. These findings highlight the deficiencies of the clarity of information that our patients have regarding long-term complications of diabetes.

Hypoglycaemia is one of the commonest acute complications of diabetes treatment. If not properly managed, it could lead to serious consequences. In order to diagnose it early, it is important that the patient has adequate knowledge to recognize the symptoms of hypoglyaemia. Although the majority of patients are aware of the chronic complications of diabetes, a reasonable percentage of patients were unaware of the symptoms of hypoglycaemia (64%). The previous studies done in Sri Lanka also have demonstrated that the majority of (90%) patients were unaware of the symptoms of hyperglycemia or hypoglycemia and only 20.7% patients were knowledgeable about symptoms of hypoglycemia (12, 17, 22, 29). A similar study done in India has also shown that only about 51.5% of the patients were aware of the symptoms of hypoglyaemia (28). This highlight

the importance of patient education related to the complications of diabetes treatment.

This study emphasizes the knowledge deficits on acute and chronic complications among Tamil patients with type 2 diabetes, despite regular clinic attendance, frequent medical consulta-tions by experts as well as media influences. The level of education seems to have direct relationship with the level of understanding regarding the complications of diabetes. However, the attendance to a diabetes education center seems to improve the level of understanding about acute and chronic complications of diabetes. This study has demonstrated that patient empowerment is possible through the expansion of diabetic education programs.

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