

Practices related to foot care among type II diabetes mellitus patients who attend diabetes clinics in General Hospital Kurunegala, Sri Lanka

Dr.I.P.Wickramasinghe, Dr.T.L.S.S.Siritunga, Dr. H.D.V.Gayathri

Abstract- Introduction: Diabetic foot problems are one of the key areas of attention and if not treated properly can lead to life threatening consequences like amputations. It can be prevented by self-care practices, early diagnosis and proper management. Therefore, patient's self-practice regarding foot care remains a mainstay of management.

Objective: To describe the level of practice of foot care among patients with Type II diabetes.

Methodology: This descriptive cross sectional study was conducted by recruiting a group of patients having diagnosed with Type II diabetes (N=384) from diabetic clinics of Provincial General Hospital Kurunegala. Interviewer administered questionnaire was used for data collection. Patient's practices on diabetic foot care were inquired. A scoring system ranging from 0-36 was utilized to analyze the responses given for level of practice. Data were analyzed by using SPSS version 20. The study was approved by the Ethics Review Committee of Post Graduate Institute of Medicine, Colombo, Sri Lanka.

Results: Mean age of participants was 58.2 years (SD ± 10) and male to female ratio was 1:3. 57% of participants were practicing self-foot examination. Regarding foot care practices, the mean practice score was 12.5, SD = 3.57, 95% CI 12.22 - 12.94. The minimum and maximum practice scores were taken 05 and 23 respectively. 89.8% participants had scored <50% of total practice score. Thirty nine (10.1%) took the practice score >50% of total practice score. There is a significant association between foot care practice with cellulites and fungal infections.

Conclusion: According to results, practices on foot care were unsatisfactory. Therefore patient education on self-care practice of foot should be incorporated into the routine care of patients with diabetes both in the hospital clinic and in the day to day practice. Examination of foot by clinic team, counseling, providing information and education during clinic sessions would help to improve this situation.

Index Terms- Care, Diabetes, Foot, Practice, Type II

I. INTRODUCTION

Chronic non communicable diseases (CNCD) have been becoming a major health problem worldwide due to its high contribution to death and disability [1]. High prevalence of CNCDs was due to demographic and epidemiological transition with increase of risk factors resulting from social and economic changes. According to World Health Organization [1], the four main types of CNCD were cardiovascular disorders, cancers, chronic respiratory disorders and diabetes. Out of CNCD's, diabetes has been becoming a rising major cause of morbidity

and premature death worldwide [1]. According to international diabetes federation [2], 371 million people were living with diabetes around the world and the prevalence of diabetes was 8.3% among the adult population by 2014 in Sri Lanka. Medically diabetes was defined as series of metabolic conditions associated with hyperglycemia caused by defects in insulin secretion, sometimes complicated by defects in insulin action [3]. "The definition of diabetes from a social point of view can be described as the burden of disease on the economy, in terms of both its costly treatment and the premature morbidity and mortality. From the individual patient's point of view diabetes was a lifelong condition requiring daily attention to self-care practices and was associated with anxiety and repeated visits to healthcare providers" [4]. Exposure to chronic hyperglycemia due to inadequate control of diabetes may result in micro-vascular and macro-vascular complications. Among them, neuropathy and ischemia are the major contributors of diabetic foot [4]. The 'diabetic foot' term describes any pathology results directly from diabetes mellitus or its long term complications [5]. Self-care practices are the most important measure of preventing diabetic foot problems. Therefore the aim of conducting current study is to find out the self-care practices among type II diabetes (DT2) patients.

II. OBJECTIVE

Practices related to foot care among type II diabetes mellitus patients who attend diabetes clinics in Provincial General Hospital Kurunegala, Sri Lanka

III. METHODOLOGY

This study was a Hospital based descriptive cross sectional study. The study was conducted at Diabetes clinics in provincial General Hospital Kurunegala (PGHK), situated in North Western Province, Sri Lanka. The study was started at March of 2015 and it was continued up to January 2016. Data collection was done at August 2015. Patients aged more than 18 years, diagnosed with DT2 and followed up in diabetes clinics for more than one month in PGHK were included in to study. Staff members of the hospital were excluded as they may be having self-care practices different from other patients. Those who were not having ability to express their views and ideas rationally also excluded. Sample size was calculated using the standard formula [6]. The size of the final sample was 384. Systematic random sampling method was utilized to select the study subjects. Interviewer administered questionnaire used as a study instrument. Other data were collected by brief examination of the foot and referring

diagnostic cards and clinic books. The “Nottingham assessment of functional foot care questionnaire” [7] which was a validated instrument for foot care practice was used to assess the foot care practices. This contained some questions not relevant to the Sri Lankan social and cultural situation. Those questions were removed after a discussion with experts. The formulated questions covered the following, information on self-foot examination and barriers to do so, important practice areas regarding cutting toenails, wound care, foot-wear usage and self-care of foot. Practice score computed by allocating marks to each response of a particular question. Good foot care practice was included for participants who scored $\geq 50\%$ of total practice scores. Poor foot care practice was included for participants who scored $< 50\%$ of total practice scores [8]. Data was processed and analyzed by using statistical package for social sciences (SPSS version 20). The chisquare (χ^2) test was used to assess the associations of categorical variables. The mean, standard deviation (SD), standard error and confidence interval (CI) were used to assess some quantitative variables. The level of significance was taken as 0.05. The ethical clearance for the study was obtained from the Ethical Review Committee of the Post Graduate Institute of Medicine, University of Colombo, Sri Lanka.

IV. RESULTS

Socio - demographic characteristics.

Study sample was comprised of patients coming from different socio-demographic settings. Their practices of foot care may vary with socio-demographic characteristics.

1. Distribution of sex of the sample

Characteristic	No (%)
	N=384
Sex (Male : Female)	98:286 (1:3)

2. Distribution of age of the sample

Age group	No (%)
	N=384
≤ 60	210 (54.6)
> 60	174 (45.3)
Total	384 (100)

Mean	Minimum	Maximum	SD
58.2 years	23 years	86 years	10 years

3. Distribution of practice score

Characteristic	No (%) (N=384)
Foot care knowledge score	
Mean	12.5
Standard error	0.19
Standard deviation(SD)	43.57
95% confidence interval (CI)	12.22 – 12.94
Minimum	05
Maximum	23
$\geq 50\%$ of total score	39 (10.1)

$< 50\%$ of total score	345 (89.8)
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4. Distribution of common practices regarding foot care

Characteristic	No (%) - Yes (N=384)	No (%) - No (N=384)
Allocate adequate time to self-foot examination	371(96.6)	13(3.4)
Perform self-foot examination	220(57.3)	164(42.5)
Cut toe nails	376(97.9)	08(2.1)
Check shoes before put them on	190(49.5)	194(50.5)
Check shoes before take them off	60(15.6)	324(84.4)
Use footwear at home	79(20.6)	305(79.4)
Gradual usage of new shoes	65(16.9)	319(83.1)
Washing feet	384(100)	00
Make foot dry after washing	135(35.2)	249(64.8)
Put a dry dressing on graze, cut or burn when get one	250(65.1)	134(34.9)
Apply moisturizing cream on foot	56(14.6)	328(85.4)

5. Frequency of cut nails and walk outside with bare foot.

Characteristic	No (%)
Frequency of cutting toe nails (n=376)	
About once a week	170 (54.2)
About once a month	188 (50)
Less than once a month	18 (4.8)
Total	376 (100)
Frequency of walk outside bare foot (N=384)	
Often	109 (28.4)
Sometimes	88 (22.9)
Rarely	33 (8.6)
Never	154 (40.1)
Total	384(100)

6. Distribution of washing feet and gradual usage of new shoes

Characteristic	No (%)
Frequency of washing feet (N=384)	
More than once a day	364(94.8)
Once a day	20 (5.2)
Total	384 (100)

Gradual usage of new shoes	(n=65)
Always	31 (47.7)
Most of the times	23 (35.4)
Sometimes	06 (9.2)
Rarely	05 (7.7)
Total	65 (100)

Absent	26 (66.7)	287 (83.2)	df = 1
Total	39 (100)	345 (100)	P = 0.01

7. Distribution of information on drying foot after washing, footwear inspection, footwear use at home, put a dry dressing on graze, cut or burn.

Characteristic	Often No (%)	Sometimes No (%)	Rarely No (%)	Total No (%)
Frequency of feet is drying after washing	78 (57.8)	48 (35.6)	09 (6.7)	(n=135) 135(100)
Frequency of checking shoes before put on	115(60.5)	58(30.5)	17(8.9)	(n=190) 190(100)
Frequency of checking shoes before take off	35(58.3)	16(26.7)	09(15)	(n=60) 60(100)
Frequency of using foot wear at home	49(62.0)	21(26.6)	09(11.4)	(n=79) 79(100)
Frequency of put a dry dressing on graze, cut or burn when you get one	133(53.2)	78(31.2)	39(15.6)	(n=250) 250(100)

8. Association of foot care practice with age and sex.

There is no significant association between foot care practice with age and sex.

9. Associations of foot care practice with foot ulcers, cellulites and fungal infections

N=384

Characteristic	Practice of foot care		χ^2 df P
	Good Number (%)	Poor Number (%)	
Foot ulcers			
Present	05 (12.8)	29 (8.4)	$\chi^2= 0.85$
Absent	34 (87.2)	316 (91.6)	df = 1
Total	39 (100)	345 (100)	P = 0.36
Cellulites			
Present	10 (25.6)	28 (8.1)	$\chi^2= 12.06$
Absent	29 (74.4)	317 (91.9)	df = 1
Total	39 (100)	345 (100)	P = 0.001
Fungal infection			
Present	13 (33.3)	58 (16.8)	$\chi^2= 6.35$

There is a significant association between foot care practice with foot cellulites and fungal infections. But there is no significant association between foot care practices with foot ulcers.

V. DISCUSSION

Foot problems are disabling complication and common among people with DT2 [5]. It is crucial that diabetic patients should have good foot care self-management skills and foot care practice to prevent foot complications. The aim of conducting the current study was to find out the practices regarding foot care among DT2 patients. There were 384 diabetic patients from diabetes clinics in Provincial General Hospital Kurunegala, Sri Lanka were included into this hospital based descriptive cross sectional study. The main objectives of the current study were to describe, socio-demographic factors and practices related to diabetic foot care. Patients aged more than 18 years, diagnosed with DT2 and followed up in diabetes clinics more than one month in PGHK were included in to the study. Diagnosis should be confirmed by a clinician by written documents. This was improved the reliability of study. Interviewer administered questionnaire was used to collect data. Scoring system was used to formulate practice score. Level of significance used as 0.05. Chisquare test (χ^2) used to test associations between practice scores and selected variables. The important findings of the current study are as follows. Mean age of participants was 58.2 years (SD ± 10) and male to female ratio was 1:3. Regarding foot care practices, the mean score was 12.5. Majority of participants (89.8%) had scored <50% of total practice score. Strengths of the study were that sample was drawn by systematic random sampling method which is a probability sampling method and adequate sample size taken. Current study methodology was designed to achieve 100% response rate. Pretested Interviewer administered questionnaire was used as study instrument due to differences in comprehension of patients, as they were in different educational levels. Data were collected within short period of time. Therefore recall bias may be there due to that (Participants did not have adequate time to recall). It was possible to overcome this recall bias, if used a self-administered questionnaire instead of interviewer administered questionnaire. But it was impossible to take self-reported data at the busy clinic setting without disturbing routine clinic work and it may further cause information bias due to differences in educational levels of patients. According to current study results, Male to female ratio was 1: 3; mean age of study participants was 58.2 years. Majority of them were belong to >60 years age group. According to another study conducted in Sri Lanka, mean age of participants was 58.4 years and 70% of participants were belong to >50 years age group [9]. These findings are consistent with current study. Another study conducted in Sri Lanka revealed that male to female ratio was 1:9 which is not consistent with current study findings [10]. These high female ratios in this study population due to, clinics were conducted on weekdays while more male patients at work compared to females. Overall foot care practice

principles were unsatisfactory in current study sample. The mean practice score was 12.5. Majority of study sample (89%) had poor foot care practices. Study findings of Desalu et al. [11] also revealed that 89.8% of study sample had poor foot care practice, which is consistent with current study findings. A majority of study subjects (57%) said they inspected their feet one or more times a day. This finding is consistent with the study carried out by George et al. [8], where it was found that 71% of the participants take care of their feet regularly. About 94% of study sample was washing their feet once or more regularly. Washing feet with water and soap keeps them clean and gives good chance to do daily inspection. This is a common regular practice of most of the Sri Lankan settings. There were 35% dried feet after washing. This practice is unsatisfactory because of if moisture stays especially in between toes, bacteria and fungus can grow, which can lead to infection. There were 65% study subjects put a dry dressing on graze, cut or burn to prevent possible contamination of wound. There are some more weaknesses as well as strengths in the practices regarding foot care identified from current study. While majority (79%) walked bare foot at home, only 60% of them walked barefoot at outside. Walking bare foot at home is a usual practice in most Sri Lankan households. Walking outside with bare foot is a more risky behavior than walking barefoot inside the home. Jayasinghe et al. [12] also confirmed that the link between foot ulceration and footwear usage by showing that barefoot diabetics had a risk ratio of 2.21 of foot ulcers, compared with footwear users. In a study done in India, 87.3% of study subjects said that they walked barefoot indoors [8]. This is consistent with current study findings. Majority of study subjects had poor shoe care practices. Of them 49% checked shoes before put them on. Only 15% checked shoes before takeoff. According to Desalu et al. [11], 61.4% of participants were unaware of inspecting inside shoes for foreign objects which is consistent with current study. On analysis of foot care practices presence of cellulites ($p=0.001$) and fungal infections ($p=0.01$) of foot were significantly associated with poor foot care practices which shows link between poor foot care practices with foot complications.

VI. CONCLUSIONS

This study was conducted on 384 DT2 clinic patients at Provincial General Hospital, Kurunegala. Of the study sample, majority was in >60 years age category. There was a female predominance. Presence of cellulitis and fungal infections was significantly associated with foot care practice, but foot care practice was not significantly associated with foot ulcers. Mean practice score was 12.5 ± 0.19 . $SD = 3.57$. 95% CI 12.22 - 12.94. The minimum and maximum practice scores were taken 05 and 23 respectively. Only thirty nine study subjects (10.1%) had a practice score of more than 50% of total practice score. When considering practices of foot care, 96.6% could allocate time for self-foot examination, but only 57.3% were performing self-foot examination. Majority (97.9%) cut their toe nails. Of them 50% were doing it once a month. Shoes were checked before put them on by 49.5%. Majority (84.4%) were not inspecting shoes before takeoff. There were 79.4% who barefoot at home. There were 40.1% never walk outside without footwear. There were minority (16.9%) using new shoes gradually. Whole study sample was

practicing washing of feet. Of them 94.8% were washing their feet more than once a day. There were 35.2% wiping foot after washing. Majority (65.1%) put a dry dressing when get a graze, cut or burn. There were 14.6% applying moisturizing cream on feet. Of them, another 16.1 % were applying moisturizing cream in between toes.

VII. RECOMMENDATIONS

The following recommendations could be made after understanding of the present study.

1. Current study shows practices regarding foot care are poor in most of the study areas in the clinic patients. These findings can be used as guidelines for health education program on foot care for people with diabetes. Emphasis should be paid on these deficient areas during health education programs.

2. The poor foot care practice may be due to lack of communication between the healthcare professionals and the patients. Poor counseling skills, lack of time allocation by the doctors and nurses as result of busy clinic schedule may be the reason for this. Therefore, patient education on self-care management of feet is important and should be incorporated into the routine diabetes care both in the clinic and in the community. Time must be allotted to counseling, providing information and education during clinic sessions.

3. Some factors elicited in this study could influence on some practice areas of foot care, such as foot wear usage and washing of feet. Health education programs should be conducted on targeting these areas.

4. The present study gives an opportunity for future researches in this area. It is better to conduct studies with larger study sample with comparative groups to compare this group with the normal population or another vulnerable group.

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E mail - iprageeth75@gmail.com

Second Author-Dr. T. L. S. S. Siritunga, Consultant Community Physician, Non Communicable Disease Unit, Ministry Of Health, Colombo 10, Sri Lanka

E mail - sssiritunga@yahoo.com

Third Author-Dr. H.D.V. Gayathri, Registrar in Community Dentistry, Office of the Regional Director of Health Services, Kalutara.

E mail - vindyagayathrihewage@gmail.com

AUTHORS

First Author- Dr. I. P. Wickramasinghe, Medical Officer (Public Health), Provincial General Hospital, Kurunegala, Sri Lanka