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Original Research Article

Knowledge and practice of foot care among the patients of diabetic foot: a hospital based cross-sectional study

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ABSTRACT

Background: Good knowledge and practice regarding diabetic foot care will reduce the risk of diabetic foot complications and that will decrease the chances of amputation of the limb.
Methods: Present study was hospital based cross- sectional study, conducted at a tertiary care centre of Ahmedabad city. Total 103 patients of diabetic foot, who had attended out patient department (OPD) of surgery from January 2015 to December 2015, were selected by purposive non probability sampling method. Twenty questions for knowledge of foot care and 14 questions for current foot care practice were included in the questionnaire and each positive answer was assigned one mark. Their knowledge and practice scores were classified as good, satisfactory and poor depending upon the score. For the knowledge and practice, if score was ≥70%, it was regarded as good, 50-69% was regarded as satisfactory and less than 50% score was regarded as poor.
Results: Only 24(23%) patients had good knowledge, 51 (50%) patients had satisfactory knowledge and 28(27%) had poor knowledge about diabetic foot care. Majority of the patients, i.e., 53 (51%) had poor practice, 34 (33%) had satisfactory practice and 16 (15%) had good practice. Duration of the diabetes and frequency of diabetic foot had significant statistical association with knowledge and practices of foot care.
Conclusions: Average Knowledge and poor practice were observed among the diabetic foot patients who have attended the OPD of surgery. It indicates need of giving proper knowledge to diabetes patients by education.

Keywords: Diabetic foot, Knowledge, Practice, Foot care

INTRODUCTION

Diabetes mellitus (DM) is a major systemic disease affecting 415 million people in the world.[1] It is increasing at an alarming rate and will become an epidemic in next few years. India is having most number of patients of DM in the world with the prevalence rate of 8.7% in adult population.[2] In 2015, there were 69.1 million patients of DM in India and would be more than 101.2 million by 2030.[2-4] On long run, diabetes leads to various complications. Diabetic foot is one of the most significant and devastating complications of diabetes, and is defined as a foot affected by ulceration that is associated with neuropathy and/or peripheral arterial disease of the lower limb in a patient with diabetes.[5] Triad of neuropathy, angiopathy and trauma will make the patients of DM more vulnerable to diabetic foot ulcer.[6] It is estimated that 15% of the patients suffering from DM will suffer from diabetic foot ulcer (DFU) in their lifetime.[7] In the absence of proper and aggressive treatment of DFU it may further progress to necrosis and gangrene and finally end up in limb amputation. Studies have shown that 3-10% of the patients with DFU will finally undergo limb amputation.[8] Worldwide, 40-60% of all non-traumatic limb amputations are because of DM and it is believed that every 30 seconds a lower limb is lost somewhere in

the world as a consequence of diabetes.[9-10] Diabetic foot has great burden on the health system also, as it is the commonest reason for hospitalization of diabetic patients (about 30% of admissions) and absorb some 20% of the total health-care costs of the disease more than all other diabetic complications.[11,12] Especially in a developing country, like India, treating diabetic foot may account for 40 percent of health resources.[13] Limb amputation itself is associated with many socioeconomic consequences for patients like, loss of productive hours at inpatient department, permanent loss of income, decreased social acceptance etc. Also, following primary limb amputation, contralateral limb amputation after two years will be observed in nearly 9% of the patients and mortality is 14% in India.[14] But with practice of proper prevention and treatment guidelines, 85% of these amputations are preventable.[15]

In India, the prevalence of diabetic foot ulcers in the clinic population is 3.6%.[14] Socio-cultural practices such as barefoot walking, religious practices like walking on fire, use of improper footwear and lack of knowledge regarding foot-care attributes towards increase in the prevalence of foot complications.[16] Studies have shown that hyperglycemia control, cessation of smoking, proper foot hygiene, daily inspection of feet for any trauma, use of proper footwear and early medical help can prevent the incidence of DFU by 50-60%.[17,18] Our study was aimed to know the prevalence of the knowledge and practice of preventive guidelines among the patients with diabetic foot attending the OPD of surgery department of a tertiary care hospital at ahmedabad. On the basis of the results of the study, we can emphasize the importance and need of the education regarding the preventive measures of diabetic foot, to the patients.

METHODS

Present study was hospital based cross- sectional study, conducted in the OPD of surgery department of a tertiary care centre situated in Ahmedabad city, Gujarat, India. Total 103 patients of diabetic foot who had attended OPD of department of surgery from January 2015 to December 2015 were selected for present study by purposive non probability sampling method. Informed written consent was taken from the participants for the interview. Data was collected by pre formed and pretested self-administered questionnaire to assess the patient's level of knowledge and practice of foot care measures.

Twenty questions for knowledge of foot care and 14 questions for current foot care practice were included in the questionnaire and each positive answer was assigned one mark. On the basis of total marks obtained by each patient, score for knowledge and that for current practice for each respondent was determined. Their knowledge and current practice for foot care were classified as good, satisfactory and poor depending upon the score obtained. For the knowledge, if the score was ≥70% (14-20), it was regarded as good, score of 50-69% (13-10) was regarded as satisfactory and that less than 50% (<10) was regarded as poor. For the practice, if score was ≥70% (10-14), it was regarded as good, score of 50-69% (9-7) was regarded as satisfactory and anything less than 50% (<7) was regarded as poor.

Above classification was made by using the score used by O. O. Desalu et al. in their study.[19] Data entry and analysis was done in software Epi info version 7.0. Frequency distribution of the variables was performed to describe the data and cross-tabulation was conducted to compare variables. Chi square test was used to find statistical significance. $p<0.05$ was considered to be statistical significance.

RESULTS

Present study was hospital based cross sectional study in which 103 participants were enrolled. Out of 103 patients, 64 (61.1%) patients belonged to the age group 51-70 years, 31 (30.1%) patients were from the age group 31-50 years and 8 (7.8%) patients were 71 years and above age group. Among them, 78 (75.7%) patients were male and 25 (24.3%) patients were female.

Total 55 (53.4 %) participants had diabetes for more than 10 years, 27 (26.2%) patients had diabetes for 5-10 years and 21 (20.4%) were suffering from DM for less than 5 years duration. 74 (71.8%) participants had diabetic foot problem first time, while rest of the 29 (28.2%) participants had diabetic foot problem second or more time.

Table 1 shows that majority respondents had correct knowledge regarding the regular use of anti-diabetic drug for prevention of complication (90.3%), checking of the leg every night (95.1%) and which part should be checked (86.4%) , and most of them (75.7%) also knew that what should be checked in the legs. More than 90% participants had knowledge that they should not walk bare foot. But only 20 to 25% knew that they should not sit cross legged or stand for longer time, the kind of shoes they should wear and detrimental effect of smoking in diabetic foot problem.

Table 2 shows, nearly 75% respondents took anti-diabetics drugs regularly. Nearly 3/5 participants checked their legs at night. Almost 50% respondents clean their legs at night, check temperature of water before using, pat dry the leg after washing their legs, antiseptic solution on the foot and apply lotion or cream if skin is dry and rough. Nearly 85% respondents did not walk bare foot but only 45% wore comfortable shoes regularly. Only 2/5 participants had consulted for their foot to doctor immediately.

Table 1: Knowledge of the respondents about foot care.

Variable	Yes (n=103)
Regular use of anti-diabetic for prevention of complication	93 (90.3%)
Is sitting with legs crossed or standing for longer time harmful for you?	25 (24.3%)
Do you aware that foot should be checked every night?	98 (95.1%)
Which part of the foot should be checked?	89 (86.4%)
What should be looked for in foot?	78 (75.7%)
How legs can be cleaned?	63 (61.2%)
When legs can be cleaned?	87 (84.5%)
Before cleaning the legs, should the temperature of water be checked or not and how?	34 (33.0%)
After washing the leg, should it be pat dried or not?	56 (54.4%)
If you feel skin is dry and rough, should lotion or cream be applied on it or not?	67 (65.0%)
Should antiseptic solution be applied on the foot?	74 (71.8%)
Is walking bare foot harmful for you?	95 (92.2%)
Is application of hot pad or hot water bottle on your foot harmful for you?	56 (54.4%)
Is removal of a callus or a wart by yourself harmful for you?	47 (45.6%)
Do you know how to cut toe nails?	46 (44.7%)
Do you know the symptoms of foot problems?	58 (56.3%)
What should be done if you find any foot problem?	53 (51.5%)
Do you know the correct size and type of footwear for you?	24 (23.3%)
Do you inspect the inside of your footwear for objects or torn lining?	45 (43.7%)
Does smoking aggravate foot problem?	21 (20.4%)

Table 2: Practice of the respondents for foot care.

Variable	Yes (n=103)
Do you take anti-diabetic drugs regularly?	78 (75.7%)
Do you check your legs every night?	58 (56.3%)
Do you clean your legs daily?	54 (52.4%)
Do you check for temperature of the water before cleaning your feet?	50 (48.5%)
Do you pat dry your legs after washing them?	47(45.6%)
Do you apply lotion or cream on the skin of your feet, if you feel it to be dry and rough?	56 (54.4%)
Do you use any antiseptic solution on the feet?	54 (52.4%)
Do you avoid walking bare foot?	88 (85.4%)
Do you avoid application of hot pad or hot water bottle on your feet?	12(11.7%)
Do you avoid removal of a callus or a wart by yourself at home?	11 (10.7%)
Do you cut toe nails straight?	32 (31.1%)
Do you wear comfortable shoes?	44 (42.72%)
Do you inspect the inside of your footwear for objects or torn lining?	40 (40. 78%)
For this foot problem have you consulted doctor immediately?	42 (40.8%)

Table 3: Distribution of the respondents according to the level of knowledge and practice.

Variable	Knowledge	Practice	P value
Poor	28(27%)	53 (51%)	0.0017
Satisfactory	51 (50%)	34 (33%)	
Good	24(23%)	16 (16%)	

Table 3 shows that majority respondents 51 (50%) had satisfactory knowledge, 28 (27%) had poor knowledge and 24(23%) had good knowledge about diabetic foot care. Although, majority 53 (51%) had poor practice, 34 (33%) had satisfactory practice and 16 (15%) had good practice. The difference between knowledge and practice of the respondents was found to be statistically significant.

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Table 4: Association of demographic variable with the level of knowledge and of practice.

Demographic variable	Level of knowledge			p value
	Poor (28)	**Satisfactory(51)**	**Good (24)**	
Age				
30-49	03 (10.7%)	18 (35.3%)	10 (41.7%)	
50-69	22 (78.6%)	29 (56.9%)	13 (54.2%)	0.12
70 and above	03 (10.7%)	04 (7.8%)	01 (4.2%)	
Sex				
Male	23 (82.1%)	36 (70.6%)	19 (79.2%)	0.47
Female	05 (17.9%)	15 (29.4%)	05 (20.8%)	
Duration of diabetes				
Less than 5 years	06 (21.4%)	07(13.7%)	08 (33.3%)	
5-10 years	14 (50.0%)	09 (17.6%)	04 (16.7%)	0.002
More than 10 years	08 (28.6%)	35 (68.6%)	12 (50.0%)	
Frequency of DF				
First time	09 (32.1%)	45 (88.2%)	20 (83.3%)	<0.0001
More than one time	19 (67.9%)	06 (11.8%)	04 (16.7%)	
Demographic variable	**Level of practice**			**p value**
	Poor (53)	**Satisfactory (34)**	**Good (16)**	
Age				
30-49	04 (7.5%)	19 (55.9%)	08 (50.0%)	
50-69	45 (84.9%)	13 (38.2%)	06 (37.5%)	<0.0001
70 and above	04 (7.5%)	02 (5.9%)	02 (12.5%)	
Sex				
Male	41 (77.4%)	27 (79.4%)	10 (62.5%)	0.40
Female	12 (22.6%)	07 (20.6%)	06 (37.5%)	
Duration of diabetes				
Less than 5 years	04 (7.5%)	09 (26.5%)	08 (50.0%)	
5-10 years	14 (26.4%)	08 (23.5%)	05 (31.3%)	0.001
More than 10 years	35 (66.0%)	17 (50.0%)	03 (18.8%)	
Frequency of DF				
First time	31 (58.5%)	30 (88.2%)	13 (81.3%)	0.007
More than one time	22 (41.5%)	04 (11.8%)	03 (18.7%)	

Table 4 shows, age of the respondents did not have any association with the knowledge, but it had highly significant association with the practice for foot care as majority of the respondents in the age group 50-69 years had poor practice score for foot care. Duration of the diabetes of the respondents had significant statistical association with knowledge (p value <0.01) and practices (p-value <0.01) regarding foot care. Same way frequency of Diabetic foot had significant statistical association with knowledge (p value <0.001) and practices (p value <0.001) regarding foot care. Sex of the respondents did not have any association for both knowledge and practice of foot care.

DISCUSSION

Present study was hospital based cross sectional study, conducted with the objective to determine the knowledge and practice of diabetic foot care among patients attending tertiary hospital of Ahmedabad. Total 103 participants were enrolled for the study. Out of 103, majority 3/5 of the diabetic foot patients were belonging to the age group of 51-70 years, whereas 1/3 were in the relatively younger age group of 31-50 years which highlights that the diabetic foot problems is a common problem of the younger age group also. Among all the patients, 78 (75.7%) were male and 25 (24.3%) were female. Total 27 (26.2%) and 21 (20.4%) participants had diabetes for 5-10 years and less than 5 years duration respectively. This indicates that practice of the diabetic foot care should be encouraged from the start of the disease. Nearly 30 % had diabetic foot problem second or more time which indicates poor practice of the diabetic foot care in the patients even after they had previous problems.

Present study revealed that majority (> 90%) of the respondents was aware about the regular use of anti-diabetic drugs for prevention of complications, which coincides with the findings of O.O. Desalu et.al. 19. In present study, nearly 95% of the participants knew that checking of the foot every night is important to prevent foot complications but only 76% of them were aware about the parts of the leg to be examined and only 60%

knew that how to clean legs. This is again a concern while educating diabetic patients, as more emphasis should be given on this aspect. As per the observation done by Seid A et al in his study, 95.8% of the respondents were aware about the frequency of washing their feet.[20] In present study, only 33% respondents knew that the temperature of water should be checked before using it. Similar findings were observed by AR Muhammad Lutfi et al. in their study in which 31 % respondents knew about this.[21] In our study, 92.2 % participants knew that they should not walk bare foot, which coincides with the study done by AR Muhammad Lutfi.[21] In present study, nearly half of the participants pat dry their legs after washing them, which is significantly lesser as compared to the observation done by Lutfi ARM et al in his study (80%).[21] In our study, only one fourth of the participants were aware about the importance of proper and comfortable footwear and nearly 43% of the participants were having the knowledge of inspection of the inside of the footwear before wearing them to prevent leg trauma, which was found significantly higher (70%) in the study done by Lutfi ARM et al.[21] This might be due to the difference in the socioeconomic and education level in both the study groups. Knowledge regarding aggravating effects of smoking on diabetic foot problem was present among 21% respondents, which is comparable with the results documented by Desalu OO et al.[19]

Regarding practice of the foot care, in this study, only ¾ participants were taking anti-diabetic drugs regularly. Half of the respondents checked and cleaned their legs every night and pat dry legs after washing. Seid et al, in his study, observed that 41.2% patients checked their legs every day and 60% pat dry their legs after washing.[20] In present study, 85% participants did not walk bare foot, which is comparable with observation made by Dikeukwu RA et al that 82% respondents did not walk bare foot.[22] Similarly, Lutfi ARM et al, also mentioned in his study that 77.1 % patients did not walk bare foot.[21] It is essential to watch inside the shoes before wearing it and to wear comfortable shoes to prevent the trauma to feet which was observed only in 2/5 respondents of this study, which is lower than the findings mentioned by Desaul OO et al in his study in which 52.3% participants checked inside the shoes.[19] In this study, nearly 40 % participants consulted the doctor immediately for this foot problem. Remaining patients had consulted a doctor even a month of the occurrence of the problem, which can be considered as a major issue as foot problem may progress further and may end up in amputation.

Present study revealed, 27 (28%) participants had poor knowledge for diabetic foot care which is higher as compared to the observation made by Gholap MC et al in their study that showed 18% of the participants had poor knowledge for the diabetic foot care.[13] In present study, majority of the patients i.e., 53 (51%) had poor practice for foot care in contradiction to the observation of Manisha et al where only 20 % participants had poor practice and 48 % had average practice for foot care.[13] Which can be explained by the fact that the study conducted by Manisha et al was in the diabetic patients, while our study was in the patients of the diabetic foot. So lesser knowledge and practice about care of feet among them, made them more vulnerable for progression to diabetic foot. In our study, good practice for the foot care was observed only in 16% respondent which is consistent with the results documented by Desalu et al, where 14% respondents had good practices for foot care.[19]

In this study, the difference between knowledge and practice of the respondents was found to be statistically significant as the knowledge of the participants was satisfactory while poor practice was observed in as high as half of the respondents. This finding was comparable with other related studies, which also reported the same pattern of level of knowledge and practice of foot care, where the score of practice was always poorer than the score of knowledge.[19,23,24]

The study revealed that the sex of the respondents had shown no significant statistical association with knowledge and practices regarding foot care. This finding supported study finding of Desalu et al.[19] Faraja S et al, reported that duration of diabetes had no correlation with the knowledge and practice behavior of the patients, which was not compatible with our finding, in which, duration of the diabetes had significant association with knowledge and practice.[25] Present study concludes that younger participants had better practice for the foot care than older ones, so concentration for the education should be more on old age population. In this study, duration of the diabetes and previous problem of the diabetic foot had significant association with knowledge and practice, wherein, patients with short history of the disease and first time development of DM foot had poor knowledge and practice behaviour. This indicates that education is needed from the early stage of the disease.

CONCLUSION

Present study infers, overall, there prevails poor knowledge and poor practice of diabetic foot care among the patients of diabetic foot. Which can be explained as a major culprit for the progression of diabetic foot to DFU and lately it may end with amputation of the limb. It can be stressed at this point that, by giving proper education, we can improve the knowledge and practice of the patients for the care of their feet and thereby improve the prognosis of the diabetic foot. This may reduce the morbidity and loss of limb in diabetic patients and that in its turn can save our resources.

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