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A Descriptive Study on the Prevalence of High Risk Foot and Self Foot Care Practices among Diabetic Individuals in Selected Hospitals of Guwahati, Assam

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Abstract: ***Diabetic foot ulcer is the most common complications which lead to amputation of lower extremity. The objective of study is to estimate the prevalence of high risk foot (HRF) and assess self foot care practices (SFCPs) among diabetic individuals from selected hospitals of Guwahati, Assam.300 participants with diabetes fulfilling inclusion criteria were screened for high risk foot with assessment of monofilament test and Nottingham Assessment of Functional Foot care Questionnaire (NAFF) for assessing self care practice. Results shows, 115 (38.3%) falls under prevalence of HRF of which 64 (55.6%) on right foot and 51 (44.4%) on left foot.190 (63.3%) had satisfactory SFCPs. There is significant association between prevalence of high risk foot and SFCPs. The association between prevalence of high risk foot with selected demographic data - age, gender, educational status, occupation, smoking habit, alcohol usage and clinical data - diabetes duration, anti - diabetic medications, other problems related with diabetes, present foot problems, foot ulcer history shows significant association. Similarly for self foot practices, demographic data - educational status, occupation, smoking habit and clinical data - family history with diabetes and present foot problems were found statistically significant. Study concludes that prevalence rate of high risk foot among diabetic individual was low and self - foot care practices were satisfactory.***

Keywords: Prevalence; HIGH - RISK foot; Self Foot Care; Practices; Diabetic Individuals

1. Introduction

"Self - care is not self - indulgence, it is self - preservation. "

- AudreLorde

Diabetes mellitus (DM) is a chronic and life - threatening disease characterised by complications of various types which are also serious and debilitating in nature.1At the time of diagnosis, many patients with Type 2 Diabetes (T2D) have one or two risk factors for diabetic foot diseases, such as Diabetic Peripheral Neuropathy (DPN) and Diabetic Foot Ulcers (DFUs).2Diabetic Foot Ulcer (DFU), is a major source of morbidity and mortality in patients diagnosed with diabetes mellitus in developing countries.1

The biggest problem in combating the illness is because of the lack of awareness regarding symptoms, risk factors and early screening for diabetic foot. These lead to untreated, late detection or poor care of a diabetic foot ulcer that consequently could lead to limb amputation.3

Peripheral Neuropathy (PN), Peripheral Arterial Disease (PAD), previous history of foot ulcer and foot deformity are risk factors.4 Walking barefoot i. e. without shoes or appropriate foot protection is one such risk factor which is related to social and cultural practices. Lack of proper health infrastructure delays the time for patient screening leads to increases risk of foot amputation. In addition to these factors, smoking and alcohol use increase the risk of Diabetic Foot Ulcer.5

Many of the foot complications in diabetes are preventable.6 Poor foot care in diabetes can lead to ulcer, amputation, sepsis and even death. Management of diabetic ulcer involves substantial cost. Therefore, identification of High Risk Foot (HRF) and importance of foot health must be communicated to the patient at an early stage in diabetes.7

2. Literature Survey

An important milestone in the history of diabetes is the establishment of the role of the liver in glycogenesis, and the concept that diabetes is due to excess glucose production Claude Bernard (France) in 1857. The role of the pancreas in pathogenesis of diabetes was discovered by Mering and Minkowski (Austria) 1889. The Meggitt–Wagner classification of Diabetic foot ulcer, is one of the most popular validated classifications for the foot ulcers.5[8] It is a six grade classification system described by Meggitt in 1976 and disseminated by Wagner in 1979. In this classification grade 0 - 3 is mainly based on neuropathy with grade 4 - 5 representing ischemic lesions. It is based on wound depth and tissue viability and assess presence of osteomyelitis. The Meggitt - Wagner classification system grades pre - ulcerative lesions (grade 0); superficial ulcer (grade 1); deep ulcer involving tendon (grade 2); ulcer with bone involvement or abscess (grade 3); limited foot gangrene (grade 4) and whole foot gangrene (grade 5).[59]

In India, diabetic foot ulcers (DFUs) affect 15% of diabetics during their lifetime. Evidence from published literature showed 100, 000 leg amputations/year due to diabetes - related problems and an expense of approximately Rs 1, 51, 935 for complete treatment of DFUs. Out of 62 million diabetics in India, 25% develop DFUs, of which 50% become infected, requiring hospitalization, while 20% need amputation.[10]

A cross - sectional study conducted by Verma M, Sharma N, Rashi, Arora V, Bashar MA, et. al. (2021) among 416 diabetic samples on "Diabetic Foot Care Knowledge and Practices in Rural North India: Insights for Preventive Podiatry" where it shows 46.7%, 32.7% and 20.6% respondents depicted good, satisfactory and poor practices regarding foot care. The study concluded that there is an evident gap between foot - care knowledge and practices that should be addressed through comprehensive behaviour change strategies.[53]

Objectives

1) To estimate the prevalence of High risk foot among diabetic individuals.
2) To identify Self Foot Care Practices among diabetic individuals.
3) To find association between prevalence of High Risk Foot and awareness on Self Foot Care practices among diabetic individuals.
4) To find out the association between prevalence of High Risk Foot among diabetic individuals with selected demographic variables.
5) To find out the association between Self Foot Care Practices among diabetic individuals with selected demographic variables.

Hypothesis:

Hypotheses are tested at 0.05 Level of Significance.

H_1 – There is significant association between prevalence of High Risk Foot and Self Foot Care Practices among diabetic individuals.

H_{2a} – There is significant association between prevalence of High Risk Foot among diabetic individuals with selected demographic data.

H_{2b} – There is significant association between prevalence of High Risk Foot among diabetic individuals with selected clinical data.

H_{3a} – There is significant association between Self Foot Care Practices among diabetic individuals with selected demographic data.

H_{3b} – There is significant association between Self Foot Care Practices among diabetic individuals with selected clinical data.

3. Methodology

The research approach adopted for the study was quantitative approach and the research design adopted was non - experimental descriptive research design. and it was used to screen the prevalence of high risk foot and identify self foot care practices among diabetic individuals. The study was conducted after getting approval from the institutional ethical committee. Formal permission was obtained from the Medical Superintendent of Ayursundra Superspecialty Hospital, ESIC Model Hospital and Health City Hospital, Guwahati, Assam.

The study subjects were assured for confidentiality of the data obtained. Anonymity of the respondents was maintained by using code number instead of their name. Informed consent was taken before conducting the study. Using convenience sampling technique, 300 participants were selected for the study.

Tools used:

The tools used for the study are –

Tool 1: Demographic performa consists of the following two sections:

Section 1A – Demographic data:

It includes 8 items like age, gender, religion, marital status, educational status, occupation, smoking habit and use of alcohol.

Section 1B – Clinical data:

It includes 10 items like duration of diabetes, family history with diabetes, anti - diabetic medications, diet restriction, other diseases related with diabetes, foot problems, foot ulcer history, testing of blood sugar, its frequency, and urine test for sugar and ketones.

Tool 2: Simplified 60 - Second Diabetic Foot Screening tool to screen HIGH - RISK diabetic foot.

The 60 - second tool was created and revised in 2012 by Ronald Gary Sibbald which has been designed to rapidly detect high risk diabetic feet, allowing for timely identification and referral of patients needing treatment.

It has 4 categories such as –

- History – of previous ulcer and amputation
- Physical examination – for deformity and ingrown toenail (thickened nail foil)
- Foot lesions – for absent pedal pulses (Dorsalispedis and/or Posterior tibial), active ulcer, blisters, calluses (thick planter skin)
- Neuropathy – monofilament examination to check the sensation

Interpretation:

i) Yes
ii) No

If yes, in either left or right foot then the patient is refer to a foot specialist or team for prevention, treatment and follow up.

Tool 3: Nottingham Assessment of Functional Footcare Questionnaire (NAFF) was used for assessing the self foot care practices.

The Questionnaire was developed by NB Lincoln in 2007 with 29 - item questionnaire. The updated (2015) version, which has 26 questionnaires has been used for the study.

Interpretation:

i) Good – if score range is 61 - 78
ii) Satisfactory – if score range is 43 - 60
iii) Poor – if score range is <42

4. Results/ Discussion

Table 1 depicts the Frequency and percentage distribution of demographic data among diabetic individuals, where it shows that Majority of the patients 166 (55.3%) were above 50 years, Out of 300 samples 162 (54%) of the samples were male. religion, in view of religion, 258 (86%) of the samples

belonged to Hindu and 286 (95.3%) were married. Regarding education 99 (33%) of the samples are educated up to high school.181 (60.3%) of the samples belonged to housewife, retired and unemployed in occupation. Majority 252 (84%) of the samples were non - smoker and 225 (75%) of the samples were non - alcoholic.

Section I

Table 1: Frequency and percentage distribution of demographic data among diabetic individuals, N=300

Sl No.	Demographic data	Frequency	Percentage
1	**Age in years**		
	a. 20 - 30 years	5	1.7
	b. 31 - 40 years	33	11
	c. 41 - 50 years	96	32
	d. Above 50 years	166	55.3
2	**Gender**		
	a. Male	162	54
	b. Female	138	46
3	**Religion**		
	a. Hindu	258	86
	b. Christian	12	4
	c. Muslim	30	10
4	**Marital status**		
	a. Married	286	95.3
	b. Unmarried	11	3.7
	c. Divorced	0	0
	d. Widow/widower	3	1
5	**Educational status**		
	a. Illiterate	26	8.7
	b. Primary	76	25.3
	c. High school	99	33
	d. Higher secondary	62	20.7
	e. Graduate	33	11
	f. Post graduate	4	1.3
6	**Occupation**		
	a. Farmer	20	6.7
	b. Business	33	11
	c. Government servant	18	6
	d. Private job	48	16
	e. Other	181	60.3
7	**Do you smoke**		
	a. Yes	27	9
	b. No	252	84
	c. Sometimes	21	7
8	**Use of alcohol**		
	a. Daily	1	0.3
	b. Occasionally	22	7.3
	c. Sometimes	52	17.3
	d. Never	225	75

Section II

Table 2 depicts the Frequency and percentage distribution of clinical data among diabetic individuals, where it shows that out of 300 samples, 97 (32.3%) were found suffering from diabetes in each of less than a year and in 1 - 5 years. Almost half i. e.143 (47%) of the samples does not have family history of diabetes.200 (66.7%) of the samples were on insulin therapy and mostly i. e.277 (92.3%) were on diabetic diet. There were 166 (55.3%) of the samples who had gastritis, appendicitis, asthma, COPD, lung cancer, hyperglycemia as other diseases. Regarding foot problems 271 (90.3%) does not have any and 274 (91.3%) with no history of foot ulcers. Most of the samples, i. e.278 (92.7%) test blood sugar regularly and 178 (59.3%) test blood sugar everyday. Majority of the samples 156 (52%) test urine for sugar and ketones.

Table 2: Frequency and percentage distribution of clinical data among diabetic individuals, N=300

S. No.	Clinical data	Frequency	Percentage
1.	**Duration with diabetes**		
	a. < 1 year	97	32.3
	b. 1 - 5 years	97	32.3
	c. 6 - 10 years	59	19.7
	d. > 10 years	47	15.7
2	**Any family history with diabetes**		
	a. < 1 year	125	41.7
	b. 1 - 5 years	143	47.6
	c. 6 - 10 years	32	10.7
3	**Present anti - diabetic medications taken**		
	a. Insulin	200	66.7
	b. Oral hypoglycemic	76	25.3
	c. Nil	24	8
	d. Both A and B	0	0
4	**Diabetic individuals with diabetic diet**		
	a. Yes	277	92.3
	b. No	5	1.7
	c. Sometimes	18	6
5	**Do you have any of the following problems**		
	a. Eye problems	15	5
	b. Heart problems	60	20
	c. Kidney problems	59	19.7
	d. Other problems	166	55.3
6	**Presently do you have any foot problems**		
	a. Yes	29	9.7
	b. No	271	90.3
7	**Do you have any history of foot ulcer**		
	a. Yes	26	8.7
	b. No	274	91.3
8	**Do you test your blood sugar regularly**		
	a. Yes	278	92.7
	b. No	22	7.3
9	**How often do you test your blood sugar**		
	a. Everyday	199	66.3
	b. Once a week	84	28
	c. Once a month	8	2.7
	d. Occasionally	8	2.7
	e. Never	1	0.3
10	**Do you test urine for sugar and ketones**		
	a. Yes	156	52
	b. No	144	48

Section III

Table 3: Frequency and percentage distribution of prevalence of high risk foot among diabetic individuals

Table 3 shows that 115 (38.3%) falls under prevalence of high risk foot, of which64 (55.6%) are identified to fall under right foot whereas 51 (44.4%) on left foot. **N=300**

Prevalence of high risk foot	Frequency	Percentage
Yes	115	38.3
No	185	61.7
If yes	**n=155**	
Right foot	64	55.6
Left foot	51	44.4

Section IV

Table 4: Frequency and percentage distribution of self foot care practices among diabetic individuals

Table 4 depicts that majority of the patients i. e.190 (63.3%) had satisfactory self foot care practices and 110 (36.7%) were poor in practices. **N=300**

Self foot care practices	f	%	Score range	Median	Mode	Mean ± SD
Poor	110	36.7	27 - 60	45	48	44.48 ± 5.626
Satisfactory	190	63.3				
Good	0	0				

Section V

Table 5: Association between high risk foot and self foot care practices among diabetic individuals, N=300

Self foot care practices	High risk foot		χ2value	df	p value
	Yes	No			
Poor	60	50	19.31	1	0.001*
Satisfactory	55	135			

***P<0.05 level of significance NS - Non significant**

Section VI

Table 6: Association between prevalence of high risk foot among diabetic individuals with selected demographic data.

Sl. No.	Demographic data	High risk foot		χ2value	df	p value
		Yes	No			
1	Age			27.16	3	**0.001***
	a. 20 - 30 years	0	5			
	b. 31 - 40 years	8	25			
	c. 41 - 50 years	22	74			
	d. Above 50 years	85	81			
2	Sex			32.42	1	**0.001***
	a. Male	86	76			
	b. Female	29	109			
3	Religion			1.22	2	0.543^{NS}
	a. Hindu	99	159			
	b. Christian	3	9			
	c. Muslim	13	17			
4	Marital status			2.004	2	0.367^{NS}
	a. Married	112	174			
	b. Unmarried	2	9			
	c. Divorced	- -	- -			
	d. Widower	1	2			
5	Educational status			26.3	5	**0.001***
	a. Illiterate	21	5			
	b. Primary	33	43			
	c. High school	33	66			
	d. Higher secondary	19	43			
	e. Graduate	8	25			
	f. Post graduate	1	3			
6	Occupation			26.04	4	**0.001***
	a. Farmer	17	3			
	b. Business	18	15			
	c. Government servant	6	12			
	d. Private job	14	34			
	e. Others	60	121			
7	Do you smoke			14.12	2	**0.002***
	a. Yes	17	10			
	b. No	85	167			
	c. Sometimes	13	8			
8	Do you drink alcohol			11.86	3	**0.008***
	a. Daily	1	0			
	b. Occasionally	8	14			
	c. Sometimes	30	22			
	d. Never	76	149			

***P<0.05 level of significance NS - Non significant**

Table 6 depicts the association between prevalence of high risk foot among diabetic individuals with selected demographic data in which Age, Gender, Educational Status, Occupation, Smoking Habit and Use of alcohol were found to be statistically significant. And hence H_{2a} is accepted. **N=300**

Table7: Association between high risk foot among diabetic individuals with selected Clinical data

S. No	Clinical data	High risk foot		χ2value	df	p value
		Yes	No			
1	How long have you been diagnosed with diabetes			23.75	3	**0.001***
	a. < 1 year	22	75			
	b. 1 - 5 years	36	61			
	c. 6 - 10 years	36	23			
	d. > 10 years	21	26			
2	Any family history with diabetes			3.168	2	0.205^{NS}
	a. Yes	42	83			
	b. No	57	86			
	c. Not known	16	16			
3	Presently, which anti - diabetic medications are you taking			6.794	2	**0.033***
	a. Insulin	87	113			
	b. Oral hypoglycemic	21	55			
	c. Nil	7	17			
	d. Both A and B	- -	- -			
4	Are you following diabetic diet			0.952	2	0.621^{NS}
	a. Yes	108	169			
	b. No	1	4			
	c. Sometimes	6	12			
5	Do you have any of the following problems			15.91	3	**0.001***
	a. Eye problems	8	7			
	b. Heart problems	31	29			
	c. Kidney problems	29	30			

	d. Other problems	47	119			
6	Presently do you have any foot problems			46.03	1	**0.001***
	a. Yes	28	1			
	b. No	87	184			
7	Do you have any history of foot ulcer			40.26	1	**0.001***
	a. Yes	25	1			
	b. No	90	184			
8	Do you test your blood sugar regularly			0.509	1	0.475^{NS}
	a. Yes	105	173			
	b. No	10	12			
9	How often do you test your blood sugar			3.715	4	0.446^{NS}
	a. Everyday	82	117			
	b. Once a week	26	58			
	c. Once a month	4	4			
	d. Occasionally	3	5			
	e. Never	0	1			
10	Do you test urine for sugar and ketones					
	a. Yes	66	90	2.172	1	0.141^{NS}
	b. No	49	95			

***P<0.05 level of significance NS - Non significant**

Table 7 depicts the association between high risk foot among diabetic individuals with selected Clinical data where duration of diabetes, anti - diabetic medications, other diseases related with diabetes, present foot problems foot ulcer history were found statistically significant. And hence H_{2b} is accepted, **N=300**

Table 8: Association between self foot care practices among diabetic individuals with selected demographic data

Sl. No.	Demographic data	Self foot care practices		χ2value	df	p value
		Poor	Satisfactory			
1	Age			3.634	3	0.304^{NS}
	a. 20 - 30 years	0	5			
	b. 31 - 40 years	12	21			
	c. 41 - 50 years	39	57			
	d. Above 50 years	59	107			
2	Sex			0.749	1	0.387^{NS}
	a. Male	63	99			
	b. Female	47	91			
3	Religion			3.846	2	0.146^{NS}
	a. Hindu	100	158			
	b. Christian	2	10			
	c. Muslim	8	22			
4	Marital status			1.701	2	0.427^{NS}
	a. Married	107	179			
	b. Unmarried	2	9			
	c. Divorced	- -	- -			
	d. Widower	1	2			
5	Educational status			21.48	5	**0.001***
	a. Illiterate	15	11			
	b. Primary	36	40			
	c. High school	39	60			
	d. Higher secondary	14	48			
	e. Graduate	6	27			
	f. Post graduate	0	4			
6	Occupation			38.11	4	**0.001***
	a. Farmer	17	3			
	b. Business	13	20			
	c. Government servant	2	16			
	d. Private job	6	42			
	e. Others	72	109			
7	Do you smoke			6.533	2	**0.038***
	a. Yes	16	11			
	b. No	87	165			
	c. Sometimes	7	14			
8	Do you drink alcohol			2.612	3	0.455^{NS}
	a. Daily	0	1			
	b. Occasionally	5	17			
	c. Sometimes	20	32			
	d. Never	85	140			

***P<0.05 level of significance NS - Non significant**

Table 8 depicts the association between self foot care practices among diabetic individuals with selected demographic data where educational status, occupation, smoking habit were found statistically significant. And hence H_{3a} is accepted, **N=300**

Table 9: Association between self foot care practices among diabetic individuals with selected clinical data

Sl. No.	Clinical data	Self foot care practices		χ2value	df	p value
		Poor	Satisfactory			
1	How long have you been diagnosed with diabetes			5.502	3	0.138^{NS}
	a. < 1 year	39	58			
	b. 1 - 5 years	41	56			
	c. 6 - 10 years	15	44			
	d. > 10 years	15	32			
2	Any family history with diabetes			9.956	2	**0.007***
	a. Yes	35	90			
	b. No	57	86			
	c. Not known	18	14			
3	Presently, which anti - diabetic medications are you taking			1.219	2	0.544^{NS}
	a. Insulin	69	131			
	b. Oral hypoglycemic	31	45			
	c. Nil	10	14			
	d. Both A and B					
4	Are you following diabetic diet			3.466	2	0.177^{NS}
	a. Yes	99	178			
	b. No	1	4			
	c. sometimes	10	8			
5	Do you have any of the following problems			1.791	3	0.617^{NS}
	a. Eye problems	5	10			
	b. Heart problems	21	39			
	c. Kidney problems	18	41			
	d. Other problems	66	100			
6	Presently do you have any foot problems			7.233	1	**0.007***
	a. Yes	4	25			
	b. No	106	165			
7	Do you have any history of foot ulcer			1.164	1	0.281^{NS}
	a. Yes	7	19			
	b. No	103	171			
8	Do you test your blood sugar regularly			0.184	1	0.668^{NS}
	a. Yes	101	177			
	b. No	9	13			
9	How often do you test your blood sugar			2.632	4	0.621^{NS}
	a. Everyday	68	131			
	b. Once a week	35	49			
	c. Once a month	3	5			
	d. Occasionally	4	4			
	e. Never	0	1			
10	Do you test urine for sugar and ketones			0.278	1	0.598NS
	a. Yes	55	101			
	b. No	55	89			

***P<0.05 level of significance NS - Non significant**

Table 9 depicts the association between self foot care practices among diabetic individuals with selected clinical data which shows family history with diabetes and present foot problems were found statistically significant. And hence H_{3b} is accepted.
N=300

5. Conclusion

Diabetes mellitus has become a fast growing public health problem and is also associated with acute as well as chronic complications. Among the complications, they are prone to develop diabetic foot ulcer which are preventable with early detection of foot at high risk, its associated factors and proper management with practice of good foot care practices. From the findings of the present study, it can be concluded it was effective to find the high risk foot and self foot care practices among diabetic individuals. It is important for the health care personnel to take initiatives for diabetic individuals in identifying with high risk foot and encouraging diabetic patients regarding self foot care practices to prevent from diabetic foot ulcers.

6. Future Scope

The study can be done in different settings. The same study can be done on a larger sample for more valid generalization.

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