



Comparison of Social determinants and Evaluation of Disease Management of diabetic patients attending Rahman Medical Institute and Nahaki Emergency Satellite Hospital, Peshawar

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Abstract

Background: Diabetes mainly depends on social determinants of health. Addressing the social determinants, and attitude toward disease management is an important step toward the prognosis, and control of diabetes. The objective of the study was to determine the contributing role of social Determinants in diabetes development and evaluation of diabetes parameters affecting the prognosis and management among the diabetic patients of NESH and RMI.

Methods: This was comparative hospital based case control study carried out from the duration of March to December 2016. A total 174 patients, 87 diabetics and 87 non diabetics were included in the study. After taking written consent, a predesigned questionnaire was filled from each patient. Data were collected and analyzed by using SPSS version 16.

Results: A total 174 study subjects, 87 diabetic (Cases) and non-diabetic (control) each from two different hospitals with equal distribution were included in the study. Out of 174 study subjects 59 (34%) were male and 115 (66%) were female. A significant difference was observed in weight and BMI $p < 0.05$ of these two groups case and control. There found no significant difference among diabetics and non-diabetes in reference to their social determinants like gender $p = 0.1683$, education $p = 0.4358$ and income $p = 0.4672$, however a significant difference between these two groups were observed in marital status $p = 0.0001$. It was found that significant difference was observed in decrease of vision ($p < 0.001$) and Ischemic necrosis of toes and finger ($p = 0.007$) among diabetics patients of both hospital.

Conclusion: The social determinants (age, gender, area, profession etc), carbohydrate and fat intake were not significantly different between diabetics and non-diabetics group. The significantly higher proportion of diabetic's patients of rural hospital were found with decrease of vision and ischemic necrosis of toes and fingers educational intervention regarding diabetes management is needed in rural areas of Khyber Pakhtunkhwa.

Keywords: DM-II, diabetes mellitus, social determinants, disease management, risk factor, diabetics, non-diabetics

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Introduction

Social determinants of health are the conditions in which individuals are born, grow, live, work, and age. Increasingly, they are being recognized for their relationship to the soaring incidence of Type 2 diabetes in the US, as well as the opportunities they present for us to counter it. Many current Type 2 diabetes interventions focus on biologic and behavioral factors, such as symptoms, diet, and physical activity (1, 2).

In Pakistan Nine million people are affected by Diabetes with the International Diabetes Federation (IDF) estimating that this number will grow to 11.5 million by year 2025 and is the fourth leading cause of death in the world according to IDF estimates (3). places the individuals at risk for serious long term complications including blindness, cardiovascular diseases, nephropathy, hypertension, stroke, neuropathy, lower limb amputations and premature death (4).

There are few prospective studies of socioeconomic differences in diabetes mortality in Pakistan (5) and the U.S. with those available often limited by examining only one socioeconomic indicator or not adjusting for other important socio-demographic and health factors. An analysis of the National Health Interview Survey (NHIS) and Linked Mortality Files data from 1987 to 1997 also found an inverse gradient for education and income associated with diabetes mortality, but did not adjust for race/ethnicity (6).

According to a few studies, findings indicate that external or upstream factors prominently affect individuals diagnosed with diabetes, in part by influencing self-management and in turn exerting lasting effect on long term diabetes and health outcomes (7, 8). There is an increased prevalence of type-II diabetes in Pakistan and main risk factors identified were obesity, overweight, family history of Diabetes Mellitus and HTN5 (8). Our research focuses on determining the social factors that influences the prognosis and management of type-II DM in diabetic patients of Nahaqi Emergency Satellite Hospital (NESH) and Rehman Medical Institute (RMI) (9). The study was conducted to determine the influence of Social variables on the course of disease (Diabetes Mellitus Type II), progression and management of the disease (DM-II) and its complications. It is a case control study and its aim is to co-relate the progression of the disease between patients of a Public (NESH) and Private (RMI) hospital and determine which variables are of greater influence.

Methodology

This was comparative case control study carried out among patients attending the OPDs and wards of Nahaki, Nahaki Emergency Satellite Hospital (NESH) and Rahman Medical Institute (RMI) from the duration of March to December 2016. After taking consent from the head of the respective Hospitals, research teams were allowed to interact with patients for data collection. A total 174 patients among them 87 were diabetics (cases) and 87 were non-diabetics and considered as control. After taking written consent, a predesigned questionnaire was filled from each patient. The questionnaire was described to the patients in their native language. The questionnaire included questions regarding weight, BMI, medical history, life style parameters, stress related history and all other social determinants affecting the health and especially diabetes. Data were collected and analyzed by using SPSS version 16.

Results

A total 174 study subjects, 87 diabetic (Cases) and non-diabetic (control) each from two different hospitals were included in the study. Out of 174 study subjects 59 (34%) were male and 115 (66%) were female. A significant number 117 (67.2%) study subjects from both hospitals were illiterate and 74 (42.5%) were very poor socioeconomic background. Major proportion of study group were married 146 (83.9%). No Significant difference were observed among diabetics and non-diabetics in reference to their social determinants like gender $p=0.1683$, education $p=0.4358$ and income $p=0.4672$, however a significant difference was observed between these two group in age and marital status $p=0.04$ and $p=0.0001$ respectively. (Table 1). When weight, BMI and mid upper arm circumference were compared between diabetics and non-diabetics, a difference was in weight and BMI $p<0.05$ of these two groups. (Table 2). Case and control group exhibited similar the daily intake of carbohydrates $p=0.12$, Fat $p=0.098$, protein $p=0.078$ and actual daily calories intake $p=0.145$ (Table 3). The diabetic patients undergoing treatment in two different hospitals shown similar trends in taking medication ($p=0.973$), frequency of glucose checkup ($p=0.876$) and history of treatment ($p=0.446$), however noteworthy difference was observed in decrease of vision ($p=<0.001$) and Ischemic necrosis of toes and finger ($p=0.007$) among diabetic patients of both hospital (Table 4).

Table 1. Demographic distribution of diabetic and non-diabetics subjects (n=87 each)

Variable		Cases (Diabetics)		Control (Non diabetics)		Total	P value
		Frequency (%)		Frequency (%)			
		RMI	NESH	RMI	NESH		
Gender	Male	21 (24.2)	12 (13.8)	18 (20.7)	8 (9.2)	59 (34)	0.1683
	Female	23 (26.4)	31 (35.6)	15 (17.2)	46 (52.9)	115 (66)	
	Total	44 (50.6)	43 (49.4)	33 (38)	54 (62)	174 (100)	
Education	Illiterate	20 (23)	39 (44.8)	27 (31.1)	31 (35.6)	117 (67.2)	0.4358
	Literate	24 (27.6)	4 (4.6)	21 (24.1)	8 (9.2)	57 (32.8)	
	Total	44 (50.6)	43 (49.4)	48 (55.2)	39 (44.8)	174 (100)	
Income	5,000-15,000	32 (36.8)		42 (48.2)		74 (42.5)	0.4672
	16,000-30,000	17 (19.6)		13 (15)		30 (17.2)	
	31,000-50,000	13 (14.9)		8 (9.2)		21 (12.1)	
	51,000 and above	25 (28.7)		24 (27.6)		49 (28.2)	
	Total	87 (100)		87 (100)		174 (100)	
Marital Status	Married	82 (94.3)		64 (73.6)		146 (83.9)	0.0001
	Unmarried	2 (2.3)		23 (26.4)		25 (14.4)	
	Widowed	3 (3.4)		0 (0)		3 (1.7)	
	Total	87 (100)		87 (100)		174 (100)	

Table 2. Comparison of Anthropometric measures of diabetic and non-diabetic subjects

Variables	Cases (Diabetics)		Control (Non diabetics)		t value	P-Value
	Mean ±SD		Mean ±SD			
	Male	Female	Male	Female		
Weight (Kg)	78.12±11.20	72.7±15.8	62.3±11.4	55±23.2	3.6867	<0.05
Height (cm)	169.05±10.6	156.02±22.2	168.43±21.6	157.01±18.2	0.012	0.097
Body Mass Index (BMI)	27.19±5.3	29.17±5.8	21.9±19.4	22 ± 24.1	6.2847	<0.05
Mid Upper Arm Circumference (MUAC)	31.30±12.3	36.6±36.9	29.8±12.3	34.8±16.9	0.4436	0.427

Table 3. Comparison of food ingredients intake of diabetic and non-diabetic patients

Variable	Cases (Diabetics)		Control (Non diabetics)		t test	P-Value
	RMI (mean ± SD)	NESH (mean ± SD)	RMI (mean ± SD)	NESH (mean ± SD)		
Actual CHO Intake	168.62 ± 102.1	81.5 ± 29.4	172.82 ± 88.7	83.3 ± 30.2	-0.048	0.12
Actual Fat Intake	29.1 ± 19.4	16.9 ± 12.6	31.6 ± 22.3	18.3 ± 11.2	-0.2161	0.098
Actual Protein Intake	38.9 ± 32.4	21.1 ± 13.7	37.4 ± 26.6	17.8 ± 14.5	0.1813	0.078
Actual Calories Intake	1244.9 ± 794.9	718.3 ± 352.7	1301.2 ± 422.5	725.4 ± 112.5	-0.0813	0.145

Table 4. Comparison of diabetic patient's management attending two different hospitals for treatment

Variable		Frequency (%)		P-Value
		RMI	NESH	
Taking Medication	Yes	40 (90.9)	39(90.7)	0.973
	No	4(9.1)	4(9.3)	
Check glucose level	Very Often	5 (11.4)	3 (7.0)	0.876
	Often	19 (43.2)	19 (44.2)	
	Rarely	19 (43.2)	19 (44.2)	
	Not at all	1 (2.3)	2 (4.7)	
Decrease in Vision	Yes	18(40.9)	36(83.7)	<0.001
	No	26(59.1)	7(16.3)	
Ischemic necrosis of Toes and Fingers	Yes	15(34.1)	27(62.8)	0.007
	No	29(65.9)	16(37.2)	
History of Proper Treatment	Yes	22(50)	25(58.1)	0.446
	No	22(50)	18(41.9)	

Discussion

The study focused on evaluation of social determinants responsible in diabetes development along with finding the difference in contributing factors for evaluation of disease management. This study found no significance difference among genders $p=0.1683$, education level $p=0.4358$, and income level $p=0.4672$ in prevalence of diabetes, however a significant difference were observed in marital status $p=0.0001$ in acquiring diabetes, as the diabetes was high among married. This study is in accordance to another study where it described that type II diabetes frequency is higher among female in the last decades of 20th century (10), but now it is equally prevalent among men and women. The physical activities after marriage decreases and stress related work increased among the women. Another study depicted that income level is not significantly associated with diabetes but education was significantly associated with diabetes risk where less educated participants were more diabetic (11). For present study a hospital was chosen in rural area where the education rate is comparatively low, therefore present study differ in presentation of association of education with risk of diabetes.

In a cross-sectional study conducted in a city in northern Punjab the total prevalence of DM type-II was found to be 13.14% and the main risk factors identified were obesity, family history, hypertension and increasing age (5). In accordance with the above study our study showed that increasing weight (p value= < 0.005) and BMI (p value < 0.005) is associated with the progression of DM type-II and its complications.

They found no significant difference in daily carbohydrate, protein, fat and calories intake between case and control group. ($p>0.05$ for all). These findings are alarming for the management of diabetes. The diabetics intake of carbohydrates and fats should be reduced. The low intake of carbohydrates and fat affects the sugar level and hence HbA1C level, described in a prospective study conducted among diabetics group (12). In a study that observed 10 obese patients with type 2 diabetes during 7 days of usual diet and 14 days of a low-carbohydrate diet (21 g of carbohydrates per day), participants lost weight and had improvement in glycemic control while eating the low-carbohydrate diet. Reduced calorie intake, not reductions in body water, accounted for the observed weight loss. This study compared low-carbohydrate diet with usual diet rather than a conventional weight loss diet (13).

The pattern of diabetes management is the same among the diabetics patients of both urban and rural area hospital and no significant difference was observed in taking medication and routine check of glucose level ($p>0.05$) in this study. However, decrease in vision ($p<0.001$) and ischemic necrosis ($p<0.007$) of toes and fingers was significantly high among diabetic patients of rural area hospital. Results present a confusing picture with possibility of inaccurate information revealed by diabetics patients admitted in rural area about their medication, diet and blood sugar level. The results were confusing and showed that majority of rural area diabetics patients do not provide a true statement in management of diabetes, in terms of taking medication, diets and sugar checkup. A study described the importance of considering the individual experience of diabetes self-management, occupations and the need to develop habits and routines to support management of diabetes (14).

Regardless of many challenges including time limitations, patient's willingness, access to a rural area, language barrier and explanation of technical terms to the patients, this study presented a productive and concurrent result. However, more in-depth studies regarding diabetes management are required for provision of concrete results to the policy makers and diabetes experts.

Conclusion

The social determinants including gender, education and income presented no significant difference in the development of the diabetes risk in both rural and

urban area of district Peshawar. Social determinants age and marital status were significantly different between diabetic and non-diabetic groups. The pattern of carbohydrate and fat intake was also not significantly different among diabetics group, showing the negative attitude toward diabetes management. The significantly higher proportion of diabetics' patients of rural hospital with decrease of vision and ischemic necrosis of toes and fingers presented a threatening clue toward management of diabetes in rural areas. Educational intervention regarding diabetes management is needed in rural areas of Khyber Pakhtunkhwa.

Acknowledgement

The authors are grateful to the staffs of Rehman medical institute and Emergency satellite Hospital Nahaki Charsadda for cooperation and offering their valuable time.

Conflict of interest

None

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