



DIAGNOSIS OF ADMITTED DIABETIC PATIENTS IN A TERTIARY CARE HOSPITAL IN PAKISTAN.

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ABSTRACT... Objectives: An observational study to assess the reasons for admission of diabetic patients in a tertiary care hospital of Pakistan. **Study Design:** Cross sectional observational study. **Setting:** Department of Medicine, PN Shifa Hospital, Karachi. **Period:** June to August 2018. **Material & Methods:** All patients admitted to medical ward of PNS Shifa over a period of three months were included in the study. Admissions were done with the primary diagnosis of diabetes in both males and females aged 20-80 years, who were taking some form of hypoglycemic agents (oral or insulin). A questionnaire was formed and filled by the investigator, containing information about demographics details of the patients, duration of diabetes, duration of hospital stay, pre-existing co-morbid conditions and principal reason for admission along with blood parameters (FBS and HbA1c). **Results:** Mean age of admitted patients in both male and females was between 36-40 years. There were more male patients who were hospitalized. Hospital stay in days was longer for men than women. Women had done primary level of education and Men had Secondary level of education. Men had diabetes of 11-15 years duration as compared to women who had diabetes of less than 10 years duration. All patients had uncontrolled diabetes despite drug treatment and as depicted by an average HbA1c of 8.07 %. A preexisting history of Hypertension, coronary artery disease, bronchial asthma and dyslipidemia were more prevalent in all diabetic patients. The four most common reasons for hospital admissions Angina/ Acute coronary syndrome, Pneumonia, Stroke and Urinary Tract Infections. **Conclusion:** This study shows that diabetic patients who were admitted had more male patients and their glycemic control was poor. Diseases of cardiovascular system was the pre-existing co-morbid associated with diabetes. Infection (Pneumonia) was the major cause of hospital admission followed by coronary artery disease (Angina/ Acute coronary syndrome).

Key words: Diagnosis, Hospital Admissions, Uncontrolled Diabetes.

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INTRODUCTION

According to the World Health Organization report, of the many noncommunicable diseases cardiovascular diseases, stroke, diabetes, cancers and chronic respiratory diseases are responsible for 71% of all deaths globally.¹ Patients with diabetes have a 3 times greater chance of hospitalization compared to those not having diabetes.² In 2018, the International Diabetes federation (IDF) calculated the global burden of diabetes for the year 2017 and 2045. It was estimated that in 2017, 8.8% of adults (aged 20-79) would be suffering from diabetes mellitus affecting 451 million in the world and it will increase to 10.4% by 2040 affecting 693 million adults.³ Type 1 and Type 2 diabetes are two

types of diabetes and the percentage of people suffering from type 2 diabetes is on the rise in most countries. Most of the people with diabetes are between 40 and 59 years of age. About 1 in 2 (212 million) people with diabetes remain undiagnosed. According to IDF 2017 report 39 million people in Middle East and North Africa suffer from diabetes. This figure would increase by 110% in 2045 to 82 million people suffering from diabetes.⁴

Diabetes is a financial burden to the patient and associated with a high morbidity and mortality. Late diagnosis of diabetes or ineffective treatment may lead to complications including cardiovascular, cerebrovascular and peripheral vascular disease,

neuropathy, infection and lower extremity amputation. Risk factors for diabetes include poor glycemic control, long duration of diabetes with associated pre-existing co-morbidities.⁵ Most hospitalizations are preventable by improving the primary care setting for diabetic patients.⁶

If diabetes is detected early by annual screening in high risk patients and upon diagnosis appropriately treating with medications, educating patients about diabetes and its complications, introducing effective immunizations against common respiratory infections: all of this will contribute to decreasing diabetes related hospitalizations.⁷ There are variable reasons for admission to a hospital in patients with diabetes according to various studies namely one done in Kuwait⁸ shows cardiovascular diseases to be more common reason for diabetic hospitalizations. The most common system affected for admission to a hospital of a diabetic patient was respiratory system followed by GIT according to one report from Nepal.⁹ This study was carried out to determine the common reasons for hospitalizations in adults with diabetes.

MATERIAL & METHODS

A cross sectional study was conducted over a period of three months from June to August 2018 in the Department of Medicine at PN Shifa Hospital, Karachi. Admissions were done with the primary diagnosis of diabetes in both males and females aged 20-80 years, who were taking some form of hypoglycemic agents (oral or insulin). A questionnaire was formed and filled by the investigator, containing information about demographics details of the patients, duration of diabetes, duration of hospital stay, pre-existing co-morbid conditions (hypertension, dyslipidemia, coronary artery disease and cerebrovascular disease) and principal reason for admission along with blood parameters (FBS and HbA1c).

Inclusion Criteria

Patients of either sex aged ≥ 20 years and above, who are diagnosed to have Type 1 or type 2 diabetes, with more than six months duration and above. For patients who were admitted more than once, only first admission was included.

Associated pre-existing history of hypertension, dyslipidemia, coronary heart disease, or cerebrovascular disease was also reviewed.

Patients with below 20 years of age, patients without diabetes, very ill/elderly patients (>80 years) and patients with gestational diabetes. Patients were excluded from the study if they did not have a clear diagnosis at the time of discharge.

Data Analysis was done through SPSS version 23.0. Continuous variables were presented as means \pm SD, whereas categorical variables were presented as frequency and percentages. An Independent sample t-test was applied to see the significance between gender vs Duration of stay (days), HbA1c and FBS. Chi-square test was used to test for differences in proportion between categorical variables. P-value of ≤ 0.05 considered to be statistically significant.

RESULTS

The mean age of admitted diabetic patients for both males and females was between 36-40 years. A total of 110 patients were included, out of which 79(71%) were males and 31(28%) were females (0.902). There were more male patients who were hospitalized as compared to women. Mean Hospital stay was longer 11.2 ± 5.2 days for males and 8.19 ± 4.4 days for females (0.006). Males had completed secondary level of education 33(41.8%) and 14 (45.2%) females had done primary level of education.

A large percentage of both groups were married, 52males (65.8%) and 19 females (61.3%). Although out of all diabetic patients, 11(35.5%) females were widowed, while 21 (26.6%) males were single (0.000). Most of the patients in diabetic group were suffering from Type 2 D/M, 75(94.9%) males and 31(100%) females (0.202).

Most of the male patients 43(54.4%) had diabetes of 11-15 years duration while females 14(45.2%) had 6-10 years duration of diabetes (0.007).

All male and female patients had poor glycemic control, HbA1c 8.07% despite on oral hypoglycemic agents or insulin (0.174).

A pre-existing disease of Hypertension, 74 patients (67.2%), Coronary heart disease, 41(37.2%), Bronchial Asthma, 12(10.9%) and dyslipidemia, 10(9.09%) are the common co-morbid conditions associated with diabetes.

Diagnosis of all admitted patients is given in Table-I. The most common cause was of some form of infections, commonest (23.6%) being Pneumonia and (10%) being urinary tract infections and Tuberculosis (8.1%). The second most common cause of admission to hospitals was Acute Coronary Syndrome/ Angina (22.7%). The third commonest cause was Stroke in 13(11.8%) patients.

Diagnosis	N (%)
Pneumonia	26(23.6%)
ACS/Angina	25(22.7%)
Stroke	13(11.8%)
UTI	11(10%)
Tuberculosis	9(8.1%)
Bronchiectasis	7(6.3%)
CCF	6(5.4%)
Diabetes with abscess	5(4.5%)
Diabetic foot	4(3.6%)
Acute exacerbation of asthma	4(3.6%)
Nephritic Syndrome	3(2.7%)
Diabetic Ketoacidosis	2(1.8%)
Renal Failure	2(1.8%)
Nephrotic Syndrome	2(1.8%)
Gall stones / Cholecystitis	2(1.8%)
COPD	1(0.9%)
Chronic Liver disease	1(0.9%)
Acute Hepatitis	1(0.9%)
Pulmonary edema	1(0.9%)
HONKS Diabetes	1(0.9%)

Table-I. Diagnosis of diabetic admitted patients

Result

Age	Gender		P-Value
	Male (n=79)	Female (n=31)	
10-25	1 (1.3%)	0 (0.0%)	0.902
26-35	9 (11.4%)	3 (9.7%)	
36-40	37 (46.8%)	16 (51.6%)	
50 or above	32 (40.5%)	12 (38.7%)	
Hospital Stay (Days)	11.22±5.2	8.19±4.4	0.006
Education			
Literate	5 (6.3%)	5 (16.1%)	0.218
Primary	27 (34.2%)	14 (45.2%)	
Secondary	33 (41.8%)	9 (29.0%)	
Intermediate	10 (12.7%)	3 (9.7%)	
Graduate	4 (5.1%)	0 (0.0%)	
Marital Status			
Married	52 (65.8%)	19 (61.3%)	0.000
Widowed	6 (7.6%)	11 (35.5%)	
Single	21 (26.6%)	1 (3.2%)	
Type of Diabetes			
Type 1	4 (5.1%)	0 (0.0%)	0.202
Type 2	75 (94.9%)	31 (100%)	
Duration of Diabetes (years)			
0-5	6 (7.6%)	1 (3.2%)	0.007
6-10	16 (20.3%)	14 (45.2%)	
11-15	43 (54.4%)	7 (22.6%)	
> 15	14 (17.7%)	9 (29.0%)	

		Gender		P-Value
		Male	Female	
FBS		145.5±25.5	148.8±35.4	0.584
HBA1c		8.07±0.6	8.26±0.7	0.174
Diabetes as a Principal diagnosis with diabetic foot	No	74 (93.7%)	31 (100.0%)	0.152
	Yes	5 (6.3%)	0 (0.0%)	
Diabetes and involvement of CVS	No	75 (94.9%)	29 (93.5%)	0.773
	Yes	4 (5.1%)	2 (6.5%)	
Diabetes and involvement of Respiratory system	No	61 (77.2%)	24 (77.4%)	0.982
	Yes	18 (22.8%)	7 (22.6%)	
Diabetes and involvement of urinary system	No	68 (86.1%)	24 (77.4%)	0.27
	Yes	11 (13.9%)	7 (22.6%)	
Diabetes and abscesses	No	74 (93.7%)	31 (100.0%)	0.152
	Yes	5 (6.3%)	0 (0.0%)	
Diabetes and Pneumonia	No	65 (82.3%)	20 (64.5%)	0.046
	Yes	14 (17.7%)	11 (35.5%)	
Diabetes and CCF	No	77 (97.5%)	28 (90.3%)	0.106
	Yes	2 (2.5%)	3 (9.7%)	
Diabetes and COPD	No	74 (93.7%)	30 (96.8%)	0.519
	Yes	5 (6.3%)	1 (3.2%)	
Diabetes and Acute Coronary syndrome	No	59 (74.7%)	27 (87.1%)	0.156
	Yes	20 (25.3%)	4 (12.9%)	
Diabetes and stroke	No	68 (86.1%)	29 (93.5%)	0.275
	Yes	11 (13.9%)	2 (6.5%)	
HONKS diabetes	No	78 (98.7%)	31 (100.0%)	0.529
	Yes	1 (1.3%)	0 (0.0%)	
Diabetic ketoacidosis	No	77 (97.5%)	31 (100.0%)	0.371
	Yes	2 (2.5%)	0 (0.0%)	
ORAL	No	9 (11.4%)	3 (9.7%)	0.795
	Yes	70 (88.6%)	28 (90.3%)	
INSULIN	No	62 (78.5%)	29 (93.5%)	0.060
	Yes	17 (21.5%)	2 (6.5%)	

DISCUSSION

Conditions such as diabetes, pneumonia and congestive heart failure are preventable and avoidable conditions for hospitalizations. Observations suggest that hospitalizations for diabetic patients are three time more frequent as compared to persons without diabetes and also increases the demand for hospital services particularly for macroangiopathy, ophthalmic, renal problems and peripheral circulatory disorders.¹⁰

The mean age of both males and females was between 36-40 years which is surprising as type 2 diabetes mellitus is more prevalent after 40 years. But this is not supported by one Kuwaiti study where 97% of type 2 diabetic patients were 60 years and older.⁸

Hospitalized patients were mostly men (71%) which may be because of early seeking of treatment options by men as compared to women depending on behavioral upbringing and cultural determinants. One Nepali study had more females (56.5%) as admitted patients than males (43.5%).⁹

The average length of hospital stay was more for men (11 days) than women (8 days). According to one study, contrary to our findings, average length of stay was of 8.3 days.¹¹ As all admitted patients had uncontrollable diabetes (HbA1c-8.0%) with added secondary diagnosis of some complications of diabetes, this could be due to long management of these conditions that the hospital stay was longer for diabetic patients as compared to non-diabetic patients. According to one study, there were no significant differences between the men and women patients with regard to age, length of hospital stay, 2-h postprandial glucose at admission or discharge, HbA1c level, body mass index, or waist-to-hip ratio.¹²⁻¹⁴

All diabetic patients who were admitted had a less than Intermediate education, with men completing secondary level and women completing primary level of education. This finding is consistent with the low literacy rate in Pakistan.

Most of the patients (97%) of males and (100%) of females had type 2 diabetes mellitus. This is in consistent with Kuwaiti study where 97% of patients also had type 2 diabetes mellitus.⁸

Ten to fifteen years was the duration of diabetes for male patients and it was less than ten years for female patients. Researchers have discovered that men at a lower BMI are more prone to develop type 2 diabetes than women at a comparable age.

All patients both male and female had uncontrolled diabetes as depicted by high HbA1c of 8.0 % which could be due to poor compliance , under drug treatment, poor blood sugar monitoring at home ,reduced hospital visits for follow up and lack or diabetes education for vigilant diabetic control of blood sugar.

Associated co-morbid conditions in diabetic patients in our setting, was hypertension, coronary heart disease, bronchial asthma and dyslipidemia which is in accordance with one study where hypertension, dyslipidemia, bronchial asthma and cerebrovascular diseases was more prevalent among diabetic patients.⁸

The prevalence of infections is being reported to be high among diabetic patients.¹⁵ Our study indicated that the most common cause for hospitalizations for diabetic patients were infections of some kind mainly pneumonia, urinary tract infections and tuberculosis. One Spanish data showed that CAP incidence seems to be increasing at a higher rate among patients with T2DM than among non-diabetic patients in cases studied from 2004-2013.⁹ Pneumonia occurring at a higher rate could be due to rate of vaccination of diabetic patients is low. Public and general practitioners' awareness for appropriate vaccination is needed to reduce morbidity and mortality from this condition. The second common cause was Acute Coronary Syndrome /Angina and third being Stroke. A majority of diabetic patients were suffering from cardiovascular and respiratory diseases as shown by one study.⁸ Again infection was the most common cause of admission of diabetic patients being urinary tract infection along with coronary heart disease,

which is in accordance with our study. Diabetes mellitus substantially increases the risk of death, ischemic events, and heart failure. Cardiovascular diseases, especially heart failure and coronary heart disease appeared as dominant reasons for hospitalizations in one study.^{16,17}

CONCLUSION

More male patients were admitted with poor glycemic control. Diseases of cardiovascular system was the pre-existing co-morbid condition associated with diabetes. Infection (Pneumonia) was the major cause of hospital admission followed by Coronary artery disease/Angina.

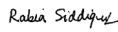

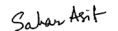
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AUTHORSHIP AND CONTRIBUTION DECLARATION

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2	Nighat Rukhsana	Critical review & final approval of work.	
3	Najmus Sahar	Data acquisition.	
4	M. Faisal Fahim	Data analysis and interpretation.	