

Assessment of delay in diagnosis and treatment adherence: A study in female diabetic patients attending the Out-Patient Department of a tertiary care hospital of West Bengal.

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Abstract: Background: According to current WHO data there is significant increase in the global prevalence of type 2 diabetes mellitus (T2DM) Though diabetes is a leading cause of mortality and morbidity, more than half of the patients are unaware of their disease in the early stage. **Objective:** The study was aimed to assess delayed diagnosis of diabetes, its clinical presentation and adherence to diabetes treatment by the patients attending the Medicine Out-Patient Department (M-OPD) of Medical College, Kolkata. **Methodology:** The study was descriptive, observational and conducted at M-OPD of Medical College, Kolkata, during August and September, 2018. All adult female diabetic patients attending the M-OPD during the study period, were considered as study subjects. A predesigned and pre-tested data collection schedule was used, data analyzed in Excel workbook, Chi-square test was done to study the association at $p \leq 0.05$ significance level. **Results:** 47 Female diabetics from M-OPD of medical college, Kolkata, were interviewed to identify important predictors for delay-in-diagnosis as well as treatment adherence. Socioeconomic status and the classical symptoms of diabetes, particularly polyuria, were important predictors for diagnostic delay of diabetes. Socioeconomic status was again responsible for treatment adherence. Insulin therapy demonstrated greater adherence compared to oral anti-diabetic drugs. **Conclusion:** More mass awareness on the early symptoms of diabetes is needed. There should be provision for patient counseling on benefits of adherence to the diabetic treatment, including pharmacotherapy as well as healthcare measures like diet and lifestyle changes.

Keywords: female diabetics, predictors, delayed diagnosis, treatment adherence, West Bengal.

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I. Background

Current WHO data suggests that the global prevalence of type 2 diabetes mellitus (T2DM) has risen from 108 million in 1980 to 422 million in 2014. (1) In India 69.2 million people were diabetic in 2015 and the projection for 2040 is 23.5 million (2). A major challenge with T2DM is diagnosis of the disease early in order to prevent progression to complications. More than half of the patients are unaware of their disease in the early stage. Even though males are more affected by diabetes, females have greater rate of mortality as well as associated morbidities due to the disease (3).

Therefore, a cross sectional study was conducted in Medical College, Kolkata. The objective was to assess delayed diagnosis of diabetes, its clinical presentation and adherence to diabetes treatment by the patients attending the Medicine Out-Patient Department (M-OPD) of the hospital.

II. Objectives

The objectives of the study were to describe the clinical presentations of diabetes mellitus in adult females attending the M-OPD of Medical College, Kolkata. The extent of diagnostic delay and treatment adherence in these diabetic patients were assessed and finally, the predictors of delayed diagnosis and treatment adherence in diabetic females were identified.

III. Methodology

A descriptive, observational study was conducted to understand prevalence of delay in diagnosis and treatment adherence. The study was performed at the M-OPD of Medical College, Kolkata, during August and September, 2018.

All adult female diabetic patients (n=47) attending the M-OPD between August-September, 2018, constituted the population of the study. Informed consent was obtained from them prior to the study. A

predesigned and pre-tested data collection schedule was used. The socioeconomic variables considered were age, residence, marital status, as well as clinical variables including presenting features of diabetes, height, weight, delay in diagnosis, adherence to diet, lifestyle changes and pharmacotherapy.

The collected data were entered in Excel workbook and analyzed. The descriptive representation of data was done by tables, diagrams and statistical means. Chi-square test was done to study the association of socio-demographic features and healthcare measures with delay-in-diagnosis and adherence at $p \leq 0.05$ significance level.

IV. Results

The present study on assessment of delay in diagnosis and treatment adherence was conducted on female diabetic patients attending the OPD of Medical College, Kolkata. A total of 47 cases participated in the study.

The age of the participants ranged at 30-72 years with median age of 45 years; 27(57.45%) were urban residents and 20(42.55%) were from rural area; 36(76.60%) were married, Mean income of the family was Rs. 4361.70. 33(70.21%) were homemakers and the remaining 14(29.79%) were engaged in different occupation. 10(21.28%) had addiction of tobacco and 3(6.28%) had addiction of betel nut and leaf. (Table 1)

Family history of diabetes was present among 20(42.55%). 10(21.28%) had one diabetic parent (2 had father & 8 had mother) , 7(14.89%) had both parents as diabetic, 3(6.38%) had diabetic sibling. 27(57.45%) were not having history of diabetes amongst first degree relatives.

Amongst classical symptoms of diabetes mellitus, polyuria was presenting feature among 36(76.60%) cases, polydipsia among 29(61.70%), polyphagia among 22(46.81%) and lethargy was seen among 18(38.3%) cases. Among 22(46.81) Body Mass Index(BMI) was ≤ 24.9 and 25(53.19%) had BMI > 24.9 .

Considering presentation of system-wise symptoms, 33(70.2%) cases were with ocular symptoms, 27(57.4%) with Nervous symptoms, 14(29.8%) presented with cardiac symptoms, 8(17.0%) with ulcer/gangrene, 7(14.9%) with nephrological symptom, and few patients (8.5%) presented with infertility. Nervous, ocular and cardiac symptoms were more self reported than diagnosed by doctors. (Table 2)

Amongst co-morbidities in study subjects, 21(44.68%) had hypertension, 7(14.89%) had thyroid disorder, 1(2.13%) found with hyperlipidemia, and another 12.13% with other co-morbidity (Figure 1).

Regarding healthcare of diabetic patients under study, 40(85.1%) started dietary modification but 22(55.0%) continued it. 4(8.5%) started yoga, 15(32%) started walking as lifestyle modification but 11(57.8%) persisted it. 42(89.4%) patients started drug therapy; 6(14.3%) with insulin, 36(85.7%) with oral antidiabetic drugs. 21(50.0%) continued drug treatment (Figure 2).

To check statistical significance for suspected predictors of delay in diagnosis, chi-square test was done. Age group, marital status, no. of children, income, substance abuse, family history of diabetes and presenting nervous symptom did not show significance ($p > 0.05$), whereas occupation, presenting symptom – polyuria, polyphagia, polydipsia showed statistical significance ($p \leq 0.05$). (Table 3)

While examining statistical significance by chi-square for predictors of treatment adherence, marital status and mode of pharmacotherapy were found significant (≤ 0.05); whereas age, number of children, income, substance abuse and presenting symptoms did not show significance ($p > 0.05$). (Table 4)

V. Discussion

The results of the present pilot study of 47 female diabetics attending the M-OPD of Medical College, Kolkata, helped to assess the significant predictors of delay-in-diagnosis as well as adherence to healthcare measures, to recommend action plan for better diabetes management in the future.

Delay-in-Diagnosis:

The socio-demographic profile of the 47 female diabetics under study from the M-OPD of Medical College, Kolkata, includes an adult-geriatric age range, differing marital status, family income, location of residence, occupation and also substance use for addiction. These were categorized for the patient population in Table I. Hypertension existed as co-morbidity in majority of these patients (Figure 1).

Different systemic symptoms related to the complications of diabetes, were categorized as either self reported or diagnosed and tabulated for the patient population under study (Table 2).

The characteristic features contributory to the delay-in-diagnosis were identified and statistically analyzed for significance ($p \leq 0.05$) and label, as important predictors of diagnostic delay (Table 3). The delay (from first onset of symptoms to diagnosis) ranged from 1 day to 1460 days (median delay, 30 days, and mean delay-in-diagnosis was 129 days for $n=47$). In a study by Samuels et al., in 2011, conducted with 298 female diabetics in Canada, median delay-in-diagnosis was 876 days (4).

An important factor influencing delay-in-diagnosis was occupation (housewife or employed) of the patient under study ($p < 0.05$). No significant association was observed for any other socio-demographic profile of the patient and delay-in-diagnosis. This is similar to the conclusions determined by Ramachandran et al., 2013 (5), and Venkataraman et al., 2009 (6).

The classical clinical presentations of T2DM, particularly polyuria, were found to be significant predictors. This feature is noteworthy as delay-in-diagnosis was probably not correlated with the classical presentations of T2DM earlier.

Adherence to treatment:

Body Mass Index (BMI) was ≤ 24.9 in 22 female diabetics (46.8%) and > 24.9 in 25 patients (53.2%). Intercept overweight, nature of marital status and nature of pharmacotherapy were identified as significant predictors of treatment adherence by the female diabetics under study (Table 4).

In the management of T2DM, initiation was relatively less for healthcare measures including yoga, walking and insulin therapy vis-a-vis diet restriction and oral anti-diabetic drugs. Adherence was however, maintained by at least half of the female diabetics who had initiated diet restriction, lifestyle changes and pharmacotherapy in general (Table V). Insulin users had significant association with adherence ($p < 0.05$) in our study.

A study by Sharma et al. (2014) presented that only 16.6% of the patients adhered to the prescribed anti-diabetic drugs; 23.3 and 31.7% of the participants followed diet restrictions and moderate exercise respectively. Among predictors of non-adherence, significant association was present with marital status, with housewives, females > 60 yrs old and women with low family income ($p < 0.05$). Greater non-adherence was associated with oral hypoglycaemics, reasons stated by the patients as multiple drug dosage. (7).

VI. Conclusion

Female diabetics ($n=47$) from M-OPD of medical college, Kolkata, were clinically observed to identify important predictors of delay-in-diagnosis as well as treatment adherence.

Socioeconomic status and the classical symptoms of diabetes, particularly polyuria, were important predictors for diagnostic delay of diabetes.

Socioeconomic status was again responsible for treatment adherence. Insulin therapy demonstrated greater adherence compared to oral anti-diabetic drugs.

The results of our study help us to recommend more mass awareness on the early symptoms of diabetes, particularly for the general population. There should also be provision for patient counseling programs, particularly, on the benefits of adherence to the diabetic treatment, including pharmacotherapy as well as healthcare measures like diet and lifestyle changes.

CONFLICT OF INTEREST: None

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Tables and Figures

Table 1: Socio-demographic profile of cases under study. (n=47)

Socio-demographic characters	No.	%
Age group (years)		
30-43	21	44.68
47-72	26	55.32
Marital status		
Married	36	76.60
Unmarried	11	23.40
Family income		
1000 – 3000	24	51.06
3001 - 6000	15	31.91
6001 – 10000	8	17.02
Residence		
Rural	20	42.55
Urban	27	57.45
Occupation		
Home maker	33	70.21
Maid	2	4.26
Agrarian	4	8.51
Service	2	4.26
Self employed	5	10.64
Other	1	2.13
Addiction		
Tobacco	10	21.28
Betel leaf & nut	3	6.38
No addiction	34	72.34

Table 2: Presentation of systemic symptoms in female diabetics under study. (n=47)

Symptom	No.(%)
Nervous symptoms	27(57.4)
	Self reported 19(70.4) Diagnosed 8(29.6)
Cardiac symptom	14(29.8)
	Self reported 7(50.0) Diagnosed 7(50.0)
Nephrological symptom	7(14.9)
	Self reported 1(14.3) Diagnosed 6(85.7)
Ocular symptom	33(70.2)
	Self reported 12(69.6) Diagnosed 21(30.4)
Ulcer/gangrene	8(17.00)
	Self reported 1(12.5) Diagnosed 7(87.5)
Infertility	4(8.5)
	Self reported 0(0.00) Diagnosed 4(100.00)

Table 3: Predictors of delay in diagnosis and their significance in female diabetics under study. (n=47)

Predictors	Characteristics of Predictors	Min. delay*	Max. delay **	p
Age group	30-43 years	10 (47.6)	11 (52.4)	>0.05
	47-72 years	18 (69.2)	8 (30.8)	
Marital status	Married	20(55.5)	16(44.5)	>0.05
	Widow	8(72.2)	3(27.8)	
No of children	0-3	21 (61.8)	13 (38.2)	>0.05
	4-9	7 (53.8)	6 (46.2)	
Occupation	Homemaker	18(54.5)	15(45.4)	≤0.05
	Other	10(71.4)	4(29.6)	
Income group	Rs 1000-3000	15(62.5)	9(37.5)	>0.05
	Rs 3000-6000	10(58.8)	7(41.1)	>0.05
	Rs 6000-10000	3(50)	3(50)	-
Substance use	Yes	8(61.5)	5(39.5)	>0.05
	No	20(59.2)	14(39.8)	-

Family history of Diabetes	Yes	10(50)	10(50)	>0.05
	No	18(66.6)	9(45.4)	20
Polyurea	Yes	19(52.7)	17(47.2)	≤0.0165
	No	9(81.8)	2(17.2)	
Polydipsia	Yes	13(44.8)	16(55.1)	≤0.05
	No	15(83.3)	3(15.7)	
Polyphagia	Yes	8(36.3)	14(63.6)	≤0.05
	No	20(80)	5(20)	
Nervous symptom	Yes	15(55.5)	12(44.4)	>0.05
	No	13(65)	7(35)	

*Defined as at least 1 day delay in diagnosis (n=47)

**Defined as maximum 1460 days delay in diagnosis (n=47)

Table 4: Predictors of treatment adherence and their significance in female diabetics under study. (n=47)

Predictors	Characteristic features of the Predictors	Adherence	Non-adherence**	p
Age group	30-48 years	10(52.6)	9(47.4)	>0.05
	49-72 years	11(47.8)	12(52.1)	
Marital status	Married	19(57.5)	14(42.5)	≤0.05
	Widow	2(22.2)	7(77.8)	
No of children	0-3	17(54.8)	14(45.2)	>0.05
	4-9	4(36.3)	7(63.6)	
Income group	Rs 1000-3000	11(50)	11(50)	>0.05
	Rs 3000-6000	9(52.9)	8(47.1)	
	Rs 6000-10000	1(33.3)	2(66.6)	
Substance use	Yes	8(66.6)	4(33.3)	>0.05
	No	13(43.3)	17(56.6)	
Polyuria	Yes	17(53.1)	15(46.9)	>0.05
	No	4(40)	6(60)	
Polydypsia	Yes	14(51.8)	13(48.2)	>0.05
	No	7(46.6)	8(53.4)	
Polyphagia	Yes	6(31.5)	13(68.5)	>0.05
	No	15(65.2)	8(34.8)	
Pharmacotherapy	Insulin	5(83.3)	1(16.7)	≤0.05
	Oral drugs	16(44.4)	20(55.6)	
Ocular symptoms	Yes	15(48.3)	16(51.6)	>0.05
	No	6(54.5)	5(45.5)	
Ulcer symptoms	Yes	5(71.4)	2(28.6)	>0.05
	No	16(45.7)	19(54.3)	

*Defined as continued pharmacotherapy.

**Defined as pharmacotherapy discontinued at any point of time.

Figure 1: Co-morbidities in female diabetics under study. (n=47)

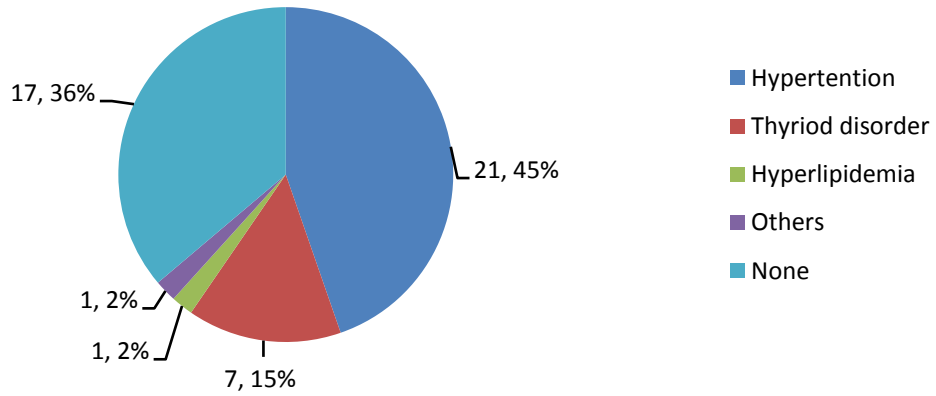
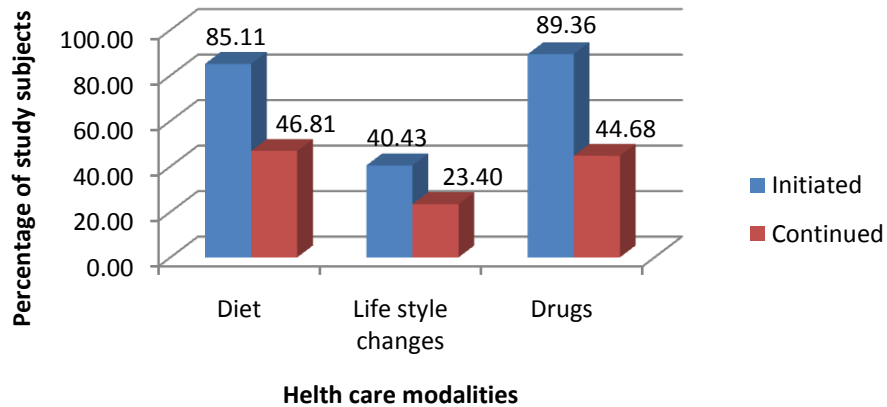


Figure 2: Healthcare modalities in female diabetics under study. (n=47)



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