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Awareness of symptomatology, natural history and complications of Diabetes Mellitus among Non Diabetics and diabetics in rural population of Wardha district of Central India.

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Abstract:
Background: Incidence of diabetes mellitus has been increasing in urban and rural areas of India and it will be one of the major causes of death in India in 21st century.* Diabetes prevalence has been rising more rapidly in middle- and low-income countries. *There is a very little data on the level of awareness and prevalence about diabetes in developing countries like India. Several studies have shown that there is a better patient's compliance for treatment and decrease in complications associated with the disease by increasing the patient's knowledge and awareness regarding the disease. With this background, the current study is planned to assess the level of awareness regarding various aspects of diabetes mellitus.
Aim: To assess the level of awareness about diabetic symptoms in non-diabetic individuals and awareness about natural history, complications of diabetes in diabetic patients. Methods: 200 non-diabetic patients and 100 diabetic patients of age >18 years were enrolled for the study.
Statistical Analysis: Percentage was calculated to look for awareness about diabetic symptoms among non-diabetic patients and for awareness of complications of diabetes among diabetic patients.
Result: There is very least awareness about diabetic symptoms among non-diabetic patients and significant lack of awareness about diabetic complications among diabetic patients.
Conclusion: Our study revealed a significant lack of knowledge and awareness about diabetes mellitus among non-diabetic and diabetic patients which underscores a need to improve our health policies and extend diabetic health programs in mass campaigns thoroughly to prevent dreadful consequences and complications of diabetes mellitus.

Key words: Diabetes Mellitus, Symptomatology, Associated Complications, Awareness

Introduction:

Incidence of diabetes mellitus has been increasing in urban and rural areas of India and it will be one of the major cause of death in India in 21st century.[1] An estimate shows that nearly 1 million Indians die due to Diabetes every year.[2] Diabetes prevalence has been rising more rapidly in middle- and low-income countries.[3] There is a very little data on the level of awareness and prevalence about diabetes in developing countries like India.[4] In fact a study demonstrated that only 22 per cent of the population thought that diabetes could be prevented.[5] The knowledge of risk factors was even lower. Only 11.9 per cent of the study subjects reported obesity and physical

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inactivity as risk factors. Even amongst the known diabetics, only 40.6 per cent were aware that diabetes could lead to some organ damage and complications. Many people (46 %) with diabetes felt that it was a temporary phenomenon.[6] WHO projects that diabetes will be the 7th leading cause of death in 2030.[7]

Studies in Asian countries showed poor and low knowledge about diabetes in rural areas.[8; 9;10] The level of awareness about diabetes was low even among diabetic population who suffered from complications of the disease.[11] Studies have shown that increasing patient knowledge regarding disease and its complications has significant benefits with regard to patient compliance to treatment and to decreasing complications associated with the disease.[12] It is believed that patient's knowledge of self care is the key to achieving therapeutic goals in ambulatory care.[13] With this background, the current study is planned to assess the level of awareness regarding various aspects (Knowledge about symptomatology of Diabetes in Non-Diabetic individuals and about complications of Diabetes in Diabetic individual, Self care and ideal period of screening) of diabetes mellitus and to assess the factors affecting this level of awareness.

Aims and Objectives:

1. To assess the level of awareness about diabetic symptoms in non-diabetic individuals.

2. To assess the awareness about Natural history, complications of diabetes in diabetic patients.

Materials and Methods:

- **Type of study:** Analytical Cross-sectional type of study

- **Study design:** Present study was carried out among 200 non-diabetic patients and 100 diabetic patients at diabetes OPD of Acharya Vinobha Bhave Rural Hospital (A.V.B.R.H.), a 909 bedded Rural Tertiary Hospital of Datta Meghe Institute of Medical Sciences (DMIMS) (Grade "A" Accredited by NAAC), Sawangi (Meghe), Wardha. Our study was carried for about 2 months duration.

Non-diabetic and diabetic patients were assessed on the basis of awareness about diabetic symptoms, diabetic complications and awareness about its ideal period of screening which is being obtained on the basis of a predesigned questionnaire.

- **Study sample:** Subjects age >18 years, either have been diagnosed as diabetics or using any hypoglycemic medication were selected as diabetic patients and random patients from OPD and patients from other wards were selected as non-diabetic patients for the study.

Participation was voluntary and written consent was acquired from each participant before administering the questionnaire, confidentiality of all participants was maintained. When the participants did not understand the questions due to language problems, interview was taken in the language of the patient (Marathi).

The questions were designed to elicit details of age, gender, family history of diabetes, general knowledge and awareness about symptoms and complications of diabetes for each participant.

- **Statistical analysis:** Percentage was taken out to look for awareness of diabetic symptoms in non-diabetic patients and awareness of natural history of diabetes and diabetic complications in diabetic patients.

Observations and Results:

- **Two hundred non-diabetic patients** were enrolled for the study and were assessed about awareness related to the symptomatology and screening tests for diabetes mellitus.

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Table no.1- Awareness about symptoms of diabetes mellitus.

SNO.	Symptoms	Yes	No	Total	% of Non-Diabetic Patients aware
1	Polyuria	44	156	200	22%
2	Polydipsia	48	152	200	24%
3	Polyphagia	51	149	200	25.5%
4	Loss of weight	55	145	200	27.5%
5	Diminision of vision	25	175	200	12.5%
6	Tingling sensations	30	170	200	15%
7	Non-healing wound/ulcer	12	188	200	6%
8	Frequent infections	18	182	200	9%
9	Recurrent itching in genital region or perineum	15	185	200	7.5%
10	Discharge per vaginum	6	194	200	3%
11	Burning micturition	5	195	200	2.5%

Percentage of patients who were found to be **aware** about symptoms of diabetes is found to be **14%**.

Table no.2- Awareness about screening tests done for diabetes mellitus.

SNO.	Screening tests	Yes	No	Total	% of Non-Diabetic Patients aware
1	Plasma/Blood Glucose	45	155	200	22.5%
2	Urine glucose level	50	150	200	25%

Percentage of patients who were found to be **aware** about screening tests done for diabetes mellitus is **23.7%**.

Table no.2(a)- Number of aware non-diabetic patients who undergo through the screening tests done for diabetes mellitus.

SNO.	Screening Tests	No. of **Aware** Non-Diabetic patients	No. Of **Aware** Non-Diabetic Patients **Undergoing through Screening Tests**	**%** of **Aware** Non-Diabetic Patients **Undergoing through Screening Tests**
1	Plasma/Blood Glucose	45	9	20%
2	Urine glucose level	50	13	26%

Percentage of aware non-diabetic patients who are found to **undergo through the screening tests** done for diabetes mellitus is **23%**.

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- **Hundred diabetic patients** were enrolled for the study and were assessed about the awareness related to the natural history, complication and hypoglycemic symptoms of diabetes mellitus.

Table no.3- Awareness about symptoms of complications.

SNO.	Symptoms of Complications	Yes	No	Total	% of diabetic patients aware
1	Diminished vision(Diabetic Retinopathy)	62	38	100	62%
2	Tingling sensations/ Numbness/ Burning or pain at the tip of toes or fingers.	30	70	100	30%
3	Trouble during maintaining an erection	4	96	100	4%
4	Swelling of legs and foot	12	88	100	12%
5	Dry and itchy skin	2	98	100	2%
6	Non-healing wound/skin	25	75	100	25%

Percentage of diabetic patients who are found to be **aware** about the symptoms of complications of diabetes mellitus is **22.5%**.

Table no.4- General Awareness about diabetes.

SNO.	Awareness about	Yes	No	Total	% of diabetic patients aware
1	Positive family history of DM leading to DM	66	34	100	66%
2	Role of lifestyle modification in treatment of DM	57	43	100	57%
3	Obesity leads to DM	53	47	100	53%
4	Cardiovascular diseases due to DM	36	64	100	36%
5	Kidney involvement due to DM	13	87	100	13%

Percentage of diabetic patients who are found to be **aware** about the General Information related to diabetes mellitus is **45%**.

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Table no.5- Awareness about hypoglycemic symptoms.

SNO.	Hypoglycemic symptoms	Yes	No	Total	% of diabetic patients aware
1	Hypotension	9	91	100	9%
2	Dizziness	14	86	100	14%
3	Tremors	11	89	100	11%
4	Excessive hunger	68	32	100	68%
5	Sweating	17	83	100	17%

Percentage of diabetic patients who are found to be **aware** about the hypoglycemic symptoms of diabetes mellitus is **23.8%**.

Table no.6- Awareness about getting following investigations done for at least once in a year:-

SNO.	Investigations/ Tests	No. of diabetic patients **aware**	No. of diabetic patients **not aware**	Total diabetic patients	**%** of diabetic patients **aware**
1	Fundoscopy of eyes	47	53	100	47%
2	Monitoring of blood glucose	67	33	100	67%
3	Blood Pressure screening	43	57	100	43%
4	ECG monitoring	31	69	100	31%
5	Cholesterol screening	27	73	100	27%
6	Kidney function test	8	92	100	8%
7	Self foot examination	13	87	100	13%

Percentage of diabetic patients who are found to be **aware** about the investigations to be done at least once in a year is **33.7%**.

Table no.6(a)- Number of aware diabetic patients who undergo through the investigations to be carried out at least once in a year.

SNO.	Investigations/ Tests	No. of **Aware** diabetic patients	No. Of **Aware** diabetic Patients **Undergoing through Investigations**	**%** of **Aware** diabetic Patients **Undergoing through Investigations**
1	Fundoscopy of eyes	47	28	59.5%
2	Monitoring of blood glucose	67	63	94%
3	Blood Pressure screening	43	25	58%
4	ECG monitoring	31	10	32%
5	Cholesterol screening	27	11	40.7%
6	Kidney function test	8	3	37.5%
7	Self foot examination	13	5	38.4%

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Percentage of diabetic patients who are found to be aware and **undergo through the investigations** to be carried out for diabetes mellitus at least once in a year is **51.4%**.

Discussion:

The management of diabetes not only includes the prescription of medicines but it does include holistic approach towards intensive patient education and counseling. The major finding in this present study is that there is a scarcity of awareness about diabetes among non diabetics and diabetics in rural population of Wardha. This is a worrying fact considering that India leads the world with over 32 million diabetic subjects and these numbers will increase to 79.4 million by the year 2030.[28] As we know that increased prevalence of diabetes can lead to negative effect on the economies of developing nations especially in a country like India where the highest increase is observed in the age group of 45-64 years which constitute the major work force. This calls attention towards the urgent need to improve the knowledge and awareness about diabetes particularly in developing countries like India.[29]

In this context, it is noteworthy that in present study among 200 non-diabetic patients, only 14% patients were found to be aware while 86% patients were unaware about diabetic symptoms which is found to be very poor as compared to other studies.[30; 31; 32] Among those 14% aware patients most of them were aware about the specific symptoms of diabetes like polyuria (22%), polydipsia (24%), polyphagia (25.5%) and loss of weight (27.5%), while they were least bothered about the other non-specific symptoms (average 8%) like frequent infections, recurrent itching in genital and perineal region, discharge per vaginum etc. as mentioned in Table No. 1.

It has been observed that there is a shortfall in the research works done related to the awareness about screening tests among non-diabetic population. In contrary to this, in present study Table No. 2 shows the awareness about screening tests done for diabetes mellitus (like fasting and post meal plasma glucose level) among non-diabetics is about 23.7% and among these 23.7% aware patients only 23% patients were found to undergo through these screening tests as estimated by Table no2(a). This is such a significant fact which can't be overlooked as it has been reported that nearly 1 million Indians die due to diabetes every year.[2]

In present study, it has been also observed that among 100 diabetic patients only 22.5% patients were aware about complications of diabetes which is found to be very less as compared to the study done in Singapore on public awareness on diabetes mellitus by Wee HL et al which revealed about 81% of people were aware about complications of diabetes mellitus.[32]

Knowledge about retinopathy as one the complications of diabetes(62%) in present study is in accordance with the study carried out in Oman and Kuwait.[33;34] While awareness about other complications of diabetes like tingling sensations/numbness at tip of toes or fingers(30%), non- healing wound skin(25%), swelling of legs and foot(12%), dry and itchy skin(2%), and trouble during maintaining erection [erectile dysfunction](4%) were estimated to be very low as depicted in Table No. 3.

General awareness of diabetes mellitus among diabetic patients in this study is found to be miserable. Only 45% patients were aware about role of obesity, positive family history, effects of lifestyle modification in diabetes mellitus and effect of diabetes on cardiovascular system (36%), renal system (13%) as described in Table no.4. This low rate of adequate knowledge about diabetes in our rural population is supported by several studies.[35; 36; 37] Most of the rural population has poor access to diabetic information.[38]

Attitude of population towards hypoglycemic event is vital since that more than 50% of

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hypoglycemic events had occurred at home and hypoglycemia was identified as a predictor of several adverse outcomes.[39;40] The diabetic patients under present study revealed negative attitude towards hypoglycemic events, only 23.8% patients were aware about hypoglycemic symptoms in diabetes mellitus as depicted in Table no.5 which is a very despondent and pitiful outcome. Similar study was carried out in UAE by Nehad M. Hamoudi et al which revealed very low awareness regarding hypoglycemic symptoms, management and its complications.[41]

In present study, all diabetic patients were assessed regarding awareness about the investigations to be carried out in diabetic patients at least once in a year and it has been observed in Table no.6 that only 33.7% patients were aware about the investigations [i.e- fundoscopy of eyes (47%), monitoring blood glucose level (67%), blood pressure screening (43%), ECG monitoring (31%), cholesterol screening (27%), kidney function test (8%) and self foot examination (13%)] and among these 33.7% aware patients only 51.4% patients were found to undergo through these investigation once in a year as depicted in Table no.6(a) which is a very discouraging outcome. This is consistent with the findings of the study carried out at Manglore, Karnataka by D Rajasekharan et al who revealed that self-care practices were found to be unsatisfactory in almost all aspects except for blood sugar monitoring and treatment adherence.[42]

Most of the diabetic patients in this study kept close tab on glucose monitoring. Almost 67% patients were well versed with the knowledge of blood glucose screening at least once in a year and about 94% patients were found to undergo through this screening test, but they exhibited very less regards towards their foot care. Only 13% patients were aware and out them only 38.4% patients reported to have meticulous eye towards foot care. This lack of awareness regarding foot care can lead to various adverse complications like diabetic foot ulcer, varicose vein and amputation of foot etc. Thus, it requires efforts to increase the awareness about knowledge and complications of diabetes mellitus among diabetics as well as among general population.

Study limitations: The study was carried out in small sample size and the study was clinic based so referral bias may be present. We had not taken into account those who were exposed or not exposed to diabetic education.

Conclusion:

This study reflects that there is very least awareness about diabetic symptoms and screening tests for diabetes among non-diabetic patients in rural population of Wardha. The awareness about complications, hypoglycemic features of diabetes among diabetic patients are also very dissatisfying. Diabetic patients of this rural population are very least bothered for self-care and the investigations to be done at least once in a year which is very deplorable fact.

Thus, this study provides an insight on knowledge and awareness about diabetes mellitus among non-diabetic and diabetic patients in rural population of Wardha district. It points at the need of various public health policies in order to increase the knowledge and awareness levels to achieve prevention and better control of diabetes and its complications among diabetic as well as among general population. We need to develop a comprehensive health education programme where all aspects of diabetes mellitus namely, knowledge about the disease, its natural history and complications, self care etc. are covered. This may be achieved by using audio-visual aids as well as posters showing patients with diabetes complications and their consequences such as lower limb amputation, blindness and renal dialysis, features of hypoglycemia etc. thus, describing bad faces of diabetes mellitus. We need to reach out to individuals who are not diagnosed

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from the community by extending the diabetic health programs in mass campaigns thoroughly. It will be beneficial if a diabetic clinic and information center for teaching diabetic patients is established where nurses, doctors, dietitians and other health team members should join their hands to help these diabetic patients to live healthy life by providing them with the right information at every available opportunity.

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