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STATUS OF DIABETIC HYPERTENSION IN KANPUR CITY AND ROLE OF PHARMACIST AS A HEALTHCARE PROFESSIONAL IN TREATMENT AND CONTROL OF DIABETIC HYPERTENSION

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ABSTRACT: Pharmacists in all practice settings are in a key position to start providing care to people, who have diabetes or are at risk of developing it, or to expand and improve their care. Pharmacy programs for patients with diabetes involve activities ranging from identifying and referring at-risk patients, to supporting American Diabetes Association recognized multi-disciplinary diabetes care programs. Pharmacists can help identify patients with diabetes through screening and should target patients at high risk, people with a family history of the disease, and women with a history of gestational diabetes or who delivered a baby weighing more than nine pounds. Patient education should be provided immediately after diagnosis, at a second stage at which time a patient assessment can be performed, and at a third stage during which patients can receive continuing education to reinforce concepts and motivational boost. One of the pharmacist's most important roles is the referral of patients to the other members of the diabetes care team. The pharmacist can play an important role in diabetes care by screening patients at risk for diabetes, assessing patient health status and adherence to standards of care, educating patients to empower them to care for themselves, referring patients to other health care professionals as appropriate, and monitoring outcomes. Providing diabetes management services requires communication skills, and a commitment of time, effort, and resources. Pharmacists who obtain training in diabetes management reap rewards in professional satisfaction and financial reimbursement.

INTRODUCTION: Hypertension and Diabetes Mellitus are now recognized as two most important “Life Style Diseases” commonly encountered in the community^{1, 2}. Both these are very closely related to Chronic Kidney Disease (CKD); which goes unrecognized most of the times.

Atherosclerotic cardiovascular disease (ASCVD)—defined as acute coronary syndromes (ACSs), a history of myocardial infarction (MI), stable or unstable angina, coronary or other arterial revascularization, stroke, transient ischemic attack, or peripheral arterial disease presumed to be of atherosclerotic origin—is the leading cause of morbidity and mortality for individuals with diabetes and is the largest contributor to the direct and indirect costs of diabetes³. However, it is an exciting time for those of us in diabetes research, and the ability to be part of a paradigm change in the understanding, approach, and management of the disease will keep us focused on the next steps to address the larger issue of prevention.

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Until then, it will continue to be the charge of Diabetes Care to provide the latest and most up-to-date information⁴.

It is associated with an increased and premature risk of cardiovascular disease as well as specific microvascular complications such as retinopathy, nephropathy and neuropathy. As a consequence of its microvascular pathology, diabetes is a leading cause of blindness, end stage renal disease and a variety of debilitating neuropathies.

Diabetes is also associated with accelerated atherosclerotic macrovascular disease affecting arteries that supply the heart, brain and lower extremities. As a result, patients with diabetes have a much higher risk of myocardial infarction, stroke and limb amputation⁵.

The micro- and macro-vascular complications of diabetes are the most common causes of renal failure, blindness and amputations leading to significant mortality, morbidity and poor quality of life; however, incomplete understanding of the causes of diabetic complications hinders the development of mechanism-based therapies⁶.

In the last 5 years new glucose lowering drugs acting on novel pathways have been developed, licensed and launched, such as the glucagon-like peptide (GLP-1) agonists (exenatide) and dipeptidyl peptidase (DPP-IV) inhibitors such as sitagliptin and vildagliptin⁷. This review also includes new agents in the area of weight loss that may have a positive effect for glucose management—for example, rimonabant⁷.

India currently faces an uncertain future in relation to the potential burden that diabetes may impose upon the country. Many influences affect the prevalence of disease throughout a country, and identification of those factors is necessary to facilitate change when facing health challenges. So what are the factors currently affecting diabetes in India that are making this problem so extreme⁸.

Prevention of diabetes is crucial to lowering disease incidence and thus minimizing the individual, familial, and public health burden. The purpose of this study to gather information on current status of type 2 diabetes and practices

concerning reduction of risk to develop type 2 diabetes.

MATERIAL AND METHODS: The study was conducted during the prime season of year 2016 at Kanpur city (U.P.) India. A total of 85 randomize screened Diabetic patients, who gave written consent to participate in the study, were enrolled from three different Endocrinology center and hospital of Kanpur. The age of patients varied from 10 plus to 60 plus and included both male and female populations. All the cases will be subjected to detailed history regarding the diabetes and diabetes hypertension complications, its nature and associated symptoms. History of oral hypoglycemic drugs, past history of any Dialysis, other investigations done previously will be recorded.

The questionnaire is designed and developed in such a way so that it could be helpful in assessing control/ eradication; awareness; implementation of awareness of the disease. A follow-up counseling was also arranged. The study was also focused to assess the patient's readiness and advising them strongly by apersonalize, clear & compelling message through the budding pharmacists.

Inclusion criteria: Patients of different age group with clinical symptoms of hypertension and type-2 diabetic mellitus both. Married and unmarried person above the age of 30 years.

Exclusion criteria: Insulin dependent or type 1diabetic patients.Type-2 diabetic patient. Patients having incomplete information about drug and diagnosis of disease.

Source of data: Out -patient department. In-patient department. Patient prescription. Information through patient.

RESULTS: The observations under the study are given in the following **Tables and Figures**.

TABLE 1: AGE WISE DISTRIBUTION OF DIABETIC HYPERTENSION

S. no.	Age In Year	Sex M=Male F=Female	Diabetic History Background	Diabetes With Hypertension (N=30)	Percentage (%)
1.	20-30	0	0	0	0%
2.	30-40	2F	0	2	6.6%
3.	40-50	2M,2F	1	4	13.3%
4.	50-60	8M,10F	9	18	60%
5.	60-70	1M,2F	2	3	10%
6.	70-80	3M	2	3	10%

TABLE 2: EDUCATION WISE DISTRIBUTION OF DIABETIC HYPERTENSION

S. No.	Characteristics	Reported Data (N=30)	Percentage
1.	Educational Background		
	1. below high school	6	20%
	2.High school/intermediate	10	33.3%
2.	Occupation		
	1.Business	5	16.6%
	2.employed in office	8	26.6%
3.	Insulin	6	20%
	3.unemployed/retired	17	56.6%
	Physical Activity	7	23.3%
5.	Frequency of Blood Sugar Measurement		
	Daily	2	6.6%
	Weekly	3	10%
	Monthly	13	43.4%
6.	Frequency of Blood Pressure Measurement		
	Daily	3	10%
	Weekly	19	63.3%
	Monthly	8	26.6%
7.	Awareness of Patient	25	85%
8.	Alcohol	4	13%

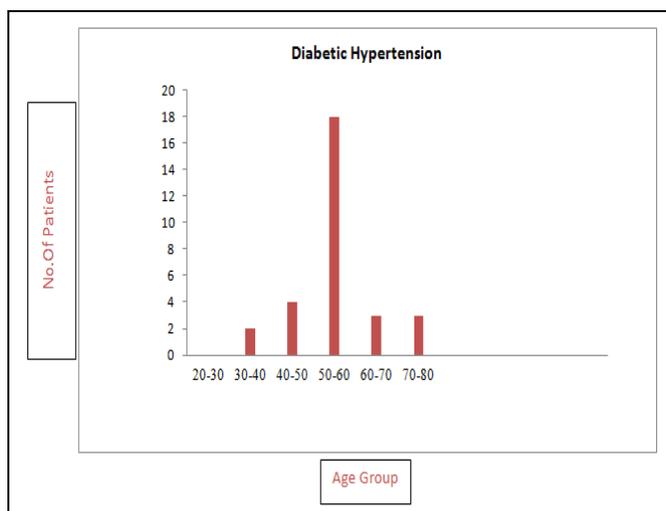


FIG. 1: AGE WISE DISTRIBUTION OF DIABETIC HYPERTENSION

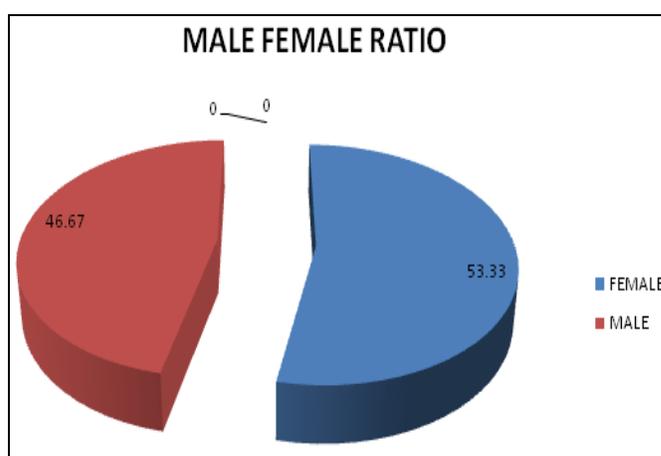


FIG. 3: MALE AND FEMALE RATIO

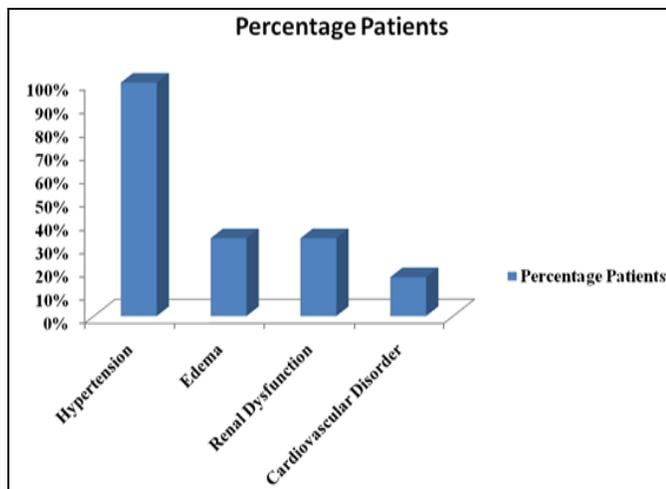


FIG. 2: VARIOUS COMPLICATIONS IN DIABETIC PATIENTS

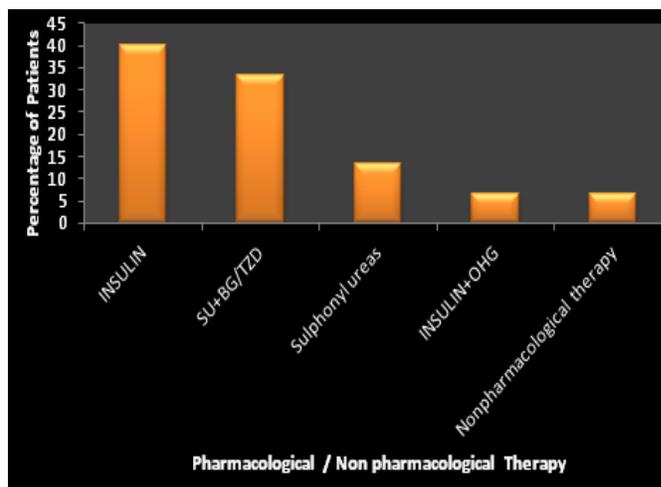


FIG. 4: VARIOUS THERAPY USED BY THE PATIENTS

TABLE 3: VARIOUS INVESTIGATIONS OF DIABETIC HYPERTENSION

S.No.	Age (years)	No. of patient(n=30)	B.P(sys/dia) mm Hg	Blood Sugar (mg/dl)	
				F S	RBS
1-	20-30	0	0	00	00
2-	30-40	02	130/85	130	259
3-	40-50	04	132/80	82	186
4-	50-60	18	140/90	95	194
5	60-70	03	140/95	110	243
6-	70-80	03	136/90	120	250

DISCUSSION AND CONCLUSION: In the present study, the most commonly affected age group of Hypertension-diabetics was between 50 to 60 years (60%) and as per W.H.O also in developing countries, the average value for the hypertensive-diabetic patients age was found to be 57.79²⁴. Patients in their age of 70-80 years might be suffering from diabetic hypertension due to age effect, lack of physical activity, diet (malnourishment/wrong dietary habits) etc. Hypertension to diabetic is one of the leading cause of chronic cardiovascular disease⁹.

The overall prevalence of diabetes among study population was 36% and the prevalence of hypertension was 59%. Among diabetes, the prevalence in males was 22% and in females it was 15%. Among hypertensives, the prevalence in males was 33.3% and in females it was 26.2%. Their mean BP was 140/100 and the mean random blood sugar was 180 mgs/dl. Factors like age, BMI and smoking showed statistical significant association towards diabetes and hypertension¹⁰.

So, from the present study indicating a sharp rise in diabetes due to genetic/family background. On analyzing by gender, the percentage of female subjects was higher than male which is as per IDF and NCEP3 criteria. It may be because most of the females in our study were housewives and performing lesser physical activity^{2,11}.

While our findings identified a lack of consistent and systematic multifactorial evidence-based approaches in delivering diabetes care, it did demonstrate pharmacists' contributions towards improving clinical and QOL outcomes. This review has revealed some questions in need of further investigations, in particular, the impact of pharmacists' interventions on all seven evidence-based factors and the effect of long term clinical and health related QOL outcomes¹².

Lifestyle encompasses modifiable social factors that have an impact on health, whether they are negative or positive. Apart from diet and weight loss, the main lifestyle intervention in the prevention and management of diabetes is to increase physical activity.

Physical activity can contribute to lower blood glucose levels and improved insulin resistance. intensive lifestyle interventions resulted in reduction of more than 5% weight loss and the loss was maintained at the fourth year in the Look AHEAD (Action for Health in Diabetes) study¹³, the majority of them do not participate in exercise programs or are physically inactive either because they lack counseling or they don't feel safe following such a program.

Therefore, an appropriate exercise program should be individual in order to cover each patient's needs. Training-exercise should be planned according to age, educational level, previous experience and the degree of familiarity of the patient to physical activity. Hypoglycemia, hyperglycemia, the deterioration of silent heart disease and aggravation of complications of the disease are the main risks during a non-safe exercise program. It is suggested that exercise can substitute pharmacological treatment in pre-diabetics⁶.

Literacy and educational programme has own importance in management and controlling of diabetes mellitus like chronic metabolic syndrome. Education of diabetes through clinical pharmacist may be an important as well as useful tool to improve complication of type 2 diabetes¹¹.

In a recent Cochrane systematic study review, authors found that in the care of elderly with poly-pharmacy, pharmaceutical care appears beneficial in terms of reducing inappropriate prescribing and medication-related problems¹⁴.

Insulin treatment is the cornerstone of diabetes management. It is the only means of achieving good glycaemic control in insulin deficient patients with type-1 diabetes. Insulin is also used as an intermittent or permanent therapy in some patients with type-2 diabetes. The UKPDS data showed that the current available treatment modalities were not satisfactory as evidenced by the high morbidity and mortality among subjects with type 2 diabetes. Both OHG and insulin treatment increased the risk of hypoglycaemia. Weight gain was significantly higher in the intensive group with a sulphonylurea (SU) (chlorpropamide, glibenclamide or glipizide) or with insulin than in the conventional group with diet, and patients assigned insulin had a greater weight gain than those assigned chlorpropamide or glibenclamide^{2,11}.

Majority of patients were not measuring their blood pressure on daily basis and generally approach to doctor or clinic in case of worsening of symptoms. Therefore the negligency may be one of the cause for the severity of disease.

Present investigation revealed, 85% non-alcoholic diabetic patients suffering from hypertension which is the quite similar to the report of Somlak Chuengsamarn². Life style and alcoholism has interaction as intake of Vitamin E, carotinoid and magnesium salt.

This was established for both the immediate care of such patients and their associated risk factors targeting holistically their care in partnership with the physician and other health care professional team. Furthermore, pharmacist contributed to medication adherence, knowledge and understanding of diabetic patients at multiple levels. Therefore, they are very valuable to the care of such patients and should be considered and involved in other health care problem management especially in patients with chronic diseases^{7,15}. An evolving role of clinical pharmacists in managing diabetes: Evidence from the literature

Newer pharmacological agents for type-2 diabetes mean that treatment options are becoming more diverse. Newer agents are targeting some of the problem areas of the conventional agents such as weight gain and hypoglycemia. The new agents covered in this review either show reductions in

weight or are weight neutral and have a positive effect on concentrations of HbA1c when compared to placebo^{11,16}.

The agents reviewed in study are welcome novel treatments and provide us with new options for the management of T2DM; however, long term safety needs to be established, particularly in the light of recent data. So Clinicians need to stay up to date with newer agents to ensure high quality diabetes care is available to patients^{2,15}.

First choice drugs for patients with diabetes are generally ACE inhibitors and angiotensin receptor blockers. These drugs have been shown to offer some protection for the kidneys, which can be damaged by diabetes. They have very mild side effect as compare to other antihypertensive agent as calcium channel blocker amlodipine.¹⁰

Many studies demonstrate the benefits of ACE inhibitors on multiple adverse outcomes in patients with diabetes, including both macrovascular and microvascular complications, in patients with either mild or more severe hypertension and in both type 1 and type 2 diabetes, the established practice of choosing an ACE inhibitor as the first-line agent in most patients with diabetes is reasonable. In patients with microalbuminemia or clinical nephropathy, both ACE inhibitors (type 1 and type 2 patients) and ARBs (type 2 patients) are considered first-line therapy for the prevention of and progression of nephropathy.

Incompliance is the major reason of severity of disease. So, efforts to prevent diabetes are necessary. So, clinical pharmacist should appoint for better patient care and thereapeutic drug monitoring. They could make a significant contribution to lowering the rate of new diabetic cases.

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