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Drug use pattern involved in diabetic with hypertension patents in a tertiary care teaching hospital

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Abstract

Diabetes is the major burden among the worldwide affecting middle-aged people to older people and it is a metabolic disorder resulting from the beta cell destruction due to an autoimmune process usually leading to insulin deficiency or insulin resistance. Type1 and Type2 diabetes are leading major health problem in India. To observe and document the drug use pattern in diabetic hypertension patients. To observe and recorded major comorbid condition associated with diabetic hypertension. To determine the most frequently used drugs in this study. During the period of study, a total of 165 cases were collected, among that 52.1% cases were males and 47.9% cases were females. In this study males were higher in number than females. Most of the patients with age group 41 to 60 (58.8%) followed by the age group of 61 to 70 (26%) were affected by diabetes with hypertension. In this study, most of the cases were recently diagnosed were found to be more with (55.8%) compared with known case with (44.2%). Atorvastatin was used more in this study in single therapy followed by metformin for patients with diabetes and hypertension. Single therapy on oral hypoglycaemic agents and antihypertensives were used more in this study. Metformin with glimepiride combination was used mostly to reduce blood glucose level in normal and then atenolol with amlodipine was preferred mostly in achieving normal blood pressure in patients with diabetic hypertension.

Keywords: Diabetes, anti-diabetic drugs, hypertension, single therapy, combination therapy, indicators

Introduction

In modern lifestyle, western diet culture, laziness due to the advancement of technology, the pervasiveness of obesity due to over consumption of junk foods leads to the prevalence of diabetes in the 21st century. Due to these factors, the prevalence rate among the worldwide should be (27%) increasing in developing nations by the year 2025. Diabetes is the prevailing health problem worldwide affecting middle-aged people to older people and it is a metabolic disorder resulting from the beta cell destruction due to an autoimmune process usually leading to insulin deficiency or insulin resistance. Type1 and Type2 diabetes are leading major health problem in developing nations and developed nations.^[1-5] Peoples with diabetes having a higher rate of cardiovascular risk and definitely with risk of hypertension⁶. Generally, hypertension in patients with diabetes associated with bunch of other cardiovascular risk factors such as obesity, insulin resistance, dyslipidaemia, atherosclerosis, and left ventricular hypertrophy. This clustering risk factor in diabetic patient's results with increases in mortality and morbidity rate⁷. However the diabetes patients develops the risk of hypertension accelerates the course of micro vascular and macro vascular disease in these patients. Patients with diabetic hypertension have a high prevalence of insulin resistance and substantially increased the risk of hyperglycaemia⁸. Most of the people with diabetes are affected in rural areas, and hence drug prescribing pattern study may help to improve the non-compliance, not only cost reduction but also reduces other complications. Another major health problem next to diabetes was hypertension. Globally 7.6% million deaths accounts for hypertension and its complications. Prevalence among the hypertension was very high in India due to various factors such as stress due to heavy work load, excessive use of canned foods and because of some life style habits like smoking, excessive alcohol intake, lack in physical activity and obesity. Based on WHO report about 45-50% death is mainly due to cardiovascular complications such as stroke, coronary artery disease associated with chronic kidney disease and diabetes^[9]. Irrational use of the drugs is considered as another health problem. To overcome these problems it is necessary to follow certain indicators to measure the performance of the prescribers and use a prescribing pattern to measure the current prescribing practice. Prescribing pattern studies mainly intend for encouraging rational drug use^[10-11].

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The prevalence rate of diabetes mellitus in India is estimated to be 7.80 % and ranks 91 and hypertension ranks the worldwide. ^[12]Antidiabetics and Antihypertensives were extremely effective although most of the cases were uncontrollable in their glycaemic levels as a result of poor patient compliance, insulin resistance, inadequate exercise and poor dietary management ^[13].

Methodology

Study type: The prospective observational study

Study site: The study was conducted at the rajah muthaih medical college Hospital (RMMCH), Annamalai Nagar, Chidambaram. It was 1350 bedded tertiary care teaching hospital.

Study Population and Sample Size Determination:

Patients with both diabetes and hypertension were registered and attended the Medicine wards of RMMCH were the subjects for the study. The details of the patients were obtained from inpatients case sheets from medicine ward. The

size of the sample was 165.

Study period

3 months

Data Collection

The first step in this study was to design data collection form and prescription analysis form. A patient data collection form was used to collect all the details like inpatient number, patient name, age, sex, date of admission, date of discharge, chief complaints, history of present illness, past medication history, laboratory data, diagnosis, dose, route of administration, frequency of the therapeutic management. A total of 165 prescriptions were collected from diabetic hypertension patients in wards of medicine. Patient's IP numbers used to draw their diabetic status from the case sheets in Medical record department. To obtain other relevant information required in the data collection form. That was not available on the filled prescriptions for each of the subject whose prescriptions have been sampled for this study.

Table 1: (Demographic characteristics)

S. No.	Characteristics	No. of. Patients n=165
1.	Gender wise distribution	
	a. Males	86(52.1%)
	b. Females	79(47.9%)
2.	Age wise distribution	
	Less than 40	11(6.6%)
	Between 41 to 60	97(58.8%)
	61 to 70	43(26%)
3.	History wise distribution	
	Known case	73(44.2%)
	Newly diagnosed case	92(55.8%)
4.	Duration of hypertension	
	1-5 years	21(12.7%)
	6-10 years	87(52.7%)
	11-20 years	57(34.6%)
5.	Obesity	
	Males	65(39.3%)
	Females	61(37%)
	No obese	39(23.7%)

Table 2: complications of hypertension:

Disease type	Co-morbid conditions	No's (%)
Diabetes+ Hypertension	Foot ulcer	4(2.5%)
	Dyslipidaemia	53(32.3%)
	Ketoacidosis	9(5.5%)
	Urinary tract infections	10(6.1%)
	Iron deficiency anaemia	6(3.7%)
	Angina	12(7.4%)
	Atherosclerosis	26(15.8%)
	Stroke	14(8.5%)
	Left ventricular dysfunction	13(8%)
	Chronic kidney disease	17(10.2%)

Table 3: Drug prescribing pattern involved with antidiabetics and antihypertensives.

Category	Therapy	Drugs	No's	%	Total No's (%)
Antihypertensives	Single therapy	Telmisartan	12	7.3%	102(62.2%)
		Candesartan	02	1.2%	
		Furosemide	14	8.5%	
		Enalapril	10	6.1%	
		Metoprolol	03	1.8%	
		Hydrochlorothiazide	05	3.1%	
		Clopidogrel	06	3.6%	

		Atorvastatin	19	11.5%	30(18%)	
		Amlodipine	08	4.8%		
		Atenolol	14	8.5%		
		Rosuvastatin	03	1.8%		
		Ramiprill	06	3.6%		
	Doublet therapy	Metoprolol+ Amlodipine	04	2.4%		
		Telmisartan+ Hydrochlorothiazide	02	1.2%		
		Losartan + Hydrochlorothiazide	02	1.2%		
		Atenolol+ Amlodipine	10	19%		
		Aspirin + clopidogrel	07	4.2%		
Antidiabetics	Single therapy	Atorvastatin + Fenofibrate	05	3.1%	21(12.8%)	
		Metformin	08	4.8%		
		Glimepiride	04	2.4%		
		Glibenclamide	02	1.2%		
		Insulin's	07	4.2%		
	Doublet therapy	Metformin +Glimepiride	09	5.4%		12(7%)
		Metformin +insulin	02	1.2%		

Table 4: (Type of therapy used)

S. No.	Characteristics	Type of cases		Total. No. Patients	Therapy type	
		Newly diagnosed case	Known case		Singlet	Doublet
1.	Diabetes + Hypertension (n=165)	92	73	165	75%	25%

Results

During the period of study, a total of 165 cases were collected, among that 52.1%% cases were males and 47.9% cases were females. In this study males were higher in number than females. Most of the patients with age group 41 to 60 (58.8%) followed by the age group of 61 to 70 (26%) were affected by diabetes with hypertension. In this study, most of the cases were recently diagnosed were found to be more with (55.8%) compared with known case with (44.2%). The demographic characteristics of the patients in the current study are shown below in Table 1. This indicates that the major comorbidities associated with Diabetic hypertension in this study were dyslipidaemia (32.3%) followed by atherosclerosis (15.8%). In the current study, most of the patients receive singlet therapy with (75%) and doublet therapy with (25%). This result shows atorvastatin used more with (11.5%), followed by Atenolol and Furosemide with (8.5%), Telmisartan (7.3%), Metformin (4.8%), Glimepiride (2.4%) and Glibenclamide (1.2%). Both newly diagnosed and existing patients with receive singlet therapy (75%) followed by doublet therapy (25%). Most of the cases in this study were very severe high blood sugar level for that they required insulin's to control sugar level in normal. Insulin's were used more with (4.2%).Next to that Atenolol with amlodipine were the most commonly used combination therapy with (19%) followed by metformin with glimepiride with (5.4%) for the patients with diabetic hypertension. Most of the males in this study were obese with (39.3%) followed by females with (37%). We observed that obesity is major cause associated with diabetic hypertension.

Discussion

Drug use pattern studies is an essential tool for the medical audit that is usually used to monitor, evaluate the medications intended for the particular disease and to bring out necessary changes in the prescribing practice¹⁴. The drug use pattern can help to improve the rational drug therapy and provide effective treatment for the patients. ^[15-16]Increased risk in death rate for diabetes among worldwide is mainly due to high blood pressure. Over the past few years prevalence rate among diabetes with hypertension has considerably increased. The treatment for the diabetes mellitus starts initially with

singlet therapy followed by doublet, triplet, and multi-therapy if required to attain better glycaemic control and to prevent its co-morbidities. The study also shows that maximum numbers of people were not aware of their health status and poor diagnosis leads to this condition. Moreover Diabetes mellitus with hypertension is associated with various complications and quite significantly leads to death. This is due to improper diet profile and poor lifestyle management may cause increase in blood pressure levels associated with diabetes. Next to hypertension, foot ulcer became the secondary complication and is almost similar to previous studies ^[17-18]. This study is wrought in rural area where men are highly affected than women. Metformin is referred as an ideal first line agent in the management of type 2 diabetes mellitus. Apart from that Metformin is available at affordable cost and thus it makes economically very helpful to the patients. In addition sulfonylureas or insulin were given in combination to Metformin for uncontrolled diabetes mellitus cases. Combination therapy with Metformin is preferred to those patients with uncontrolled diabetes even with the help of diet and exercise. Metformin, on the other hand does not cause weight gain and weight reduction occurs in more cases. The other anti-diabetic agents are not predominantly used due to the excessive cost, physician's choice and unavailability of medicines. The degree of achieving better glycaemic control does not possibly occur with oral anti-diabetic drugs in type 2 diabetes mellitus as Insulin deficiency is noted in such cases ^[19-20]. The roles of Statins were crucial in hospitalized patients among diabetes with hypertension. The use statin therapy helps to prevent myocardial infarction, which is the major complication associated with diabetic hypertension patients. It is also indicated for the excess weight patients with diabetes. Statins helps to reduce the blood pressure and also it is recommended to treat dyslipidemia that commonly associated with Diabetes with hypertension patients ^[21]. In this study most of hospitalized patients don't require single therapy. Initially they were started with doublet therapy if BP level is above 150/90 mmhg. Diuretics were seen in most of the prescription with hospitalization. Apart from that aspirin were preferred for the patients with diabetes with hypertension. Few cases with diabetic foot ulcer and amputation were seen very rare in patients with diabetic hypertension. Third

generation cephalosporin such as cefotaxime and ceftriaxone and metronidazole plays an active part in treating foot infections with diabetic hypertension [22].

Conclusion

Diabetes with Hypertension cases is associated with an increased risk of cardiac complications and also a major cause for increase in morbidity and mortality rate in developing and developed countries. In this study we observed that the treatment for patients with diabetic hypertension was to achieve BP goal followed by reduction in blood glucose levels. We have observed that Diabetic patients with increased cardiac risk particularly with high risk of stroke and dyslipidaemia. In the end we concluded that major co morbidity associated with diabetic hypertension was dyslipidaemia and atherosclerosis. This shows high level of lipids in those patients causes an increase in blood pressure. The arrival of statins plays a crucial role in diabetic hypertension cases. Atorvastatin was used more in this study in single therapy followed by metformin for patients with diabetes and hypertension. Single therapy on oral hypoglycaemic agents and antihypertensives were used more in this study. Metformin with glimepiride combination was used mostly to reduce blood glucose level in normal and then atenolol with amlodipine was preferred mostly in achieving normal blood pressure in patients with diabetic hypertension. And finally this study observed that the patients with both diabetes and hypertension required proper dietary control, life style modifications such as physical exercises, yoga, meditation and reduction in obese level.

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