ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 03, 2021

Use of Antihypertensive Drugs for Hypertensive Diabetic Patients

Dr.shrinivas.R.Raikar[1], Dr.Dayanand.R.Raikar[2], Dr.Dattanand.R.Raikar[3], Dr.Shankar.R.Raikar[4], Dr.Preeti.S.Raikar[5]

[1]Associate professor, Department of pharmacology BLDE(Deemed to be University), Shri.B.M.Patil Medical college, Hospital and Research centre, Vijayapura, Karnataka

[2]Associate Professor, Department of Dermatology and venerology, Gulbarga institute of medical science , Kalaburgi, Karnataka

[3]Consultant paediatrician, Karwar, karnataka

[4]Consultant Cardiologist, Sirasi, Karnataka

[5]Consultant Gynecologist, Sirasi, Karnataka

Abstract

The study is conducted to find out the effects of the use of antihypertensive drugs for the treatment of diabetic hypertensive patients. It is widely known by the researchers and doctors that diabetes miletus is increasing day by day and similarly hypertension is also not an exception. For that purpose, researchers and doctors did excellent work and managed to produce very effective drugs for the treatment of hypertension and diabetes. However, the present study is conducted to examine 100 patients admitted in a hospital. Their BP, Blood sugar level were examined on daily basis. The duration of the stay of all the patients were also recorded regularly. Moreover, the diseases that were originated with diabetes and hypertension were also examined and mentioned. The effect of the use of antihypertensive drugs were assessed by SPSS analysis. The results indicated that diabetes and hypertension co existed in a large number of patients. The use of hypertensive medicines proved to be helpful in treating the patients of hypertension but created some other complexities.

Keywords: Antihypertensive Drugs, Diabetes, Hypertension

Corresponding Author:
Dr.shrinivas.R.Raikar
Associate professor, Department of pharmacology
BLDE(Deemed to be University)
Shri.B.M.Patil Medical college, Hospital and Research centre
Vijayapura, Karnataka
Email: shrinivasraikar@gmail.com

ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 03, 2021

Introduction

The cases of hypertension, depression, and diabetes mellitus are increasing day by day at a tremendous rate especially in developing as well as in developed countries. Globally people living with diabetes are about 463 million ranging in age from 20 to 80 years. Furthermore, under-age children are also affected by this disease with a counting head of 1.1 million. In 2010 the projection that was made upon the basis of available figures to rise till 2025 was 438 million but the real figure to date is 463 million. The greatest rate of increase in diabetes mellitus is expected to occur in the Middle East, Sub-Saharan Africa, and India as well (Raikar, 2015).

Hypertension is the most dangerous disease one of the main agents instigating diabetes mellitus all over the world. It leads to coronary heart disease, heart failure, angina pectoris, and end-stage renal disease. Diabetic patients are at adverse risk of cardiovascular diseases (Grossman, 2000). The data from various regional and national surveys denotes that the tendency of hypertension is not very uncommon in countries that are developing, especially in the urban areas where the treatments are comparatively low. The control of poor blood pressure is very important. The other name of high blood pressure is hypertension. Hypertension prompts extreme unpredicted issues and increases the risk of stroke, coronary illness, and at times passing.

The pressing factor of the pulse depends upon the obstruction of the veins and how hard the heart needs to function.. Effective treatment of hypertension is possible with good management and the use of antihypertensive diabetic drugs (Van Hoeven, 1990). All three are mutually interlinked starting from hypertension and depression leading to diabetes mellitus with increased chances of heart failure that might be ending with death. So the thing is how to manage the initial stage of hypertension that is the reason for hypertensive diabetes. Multiple studies indicate common risk factors for poor control of hypertension include older age, obesity, longer duration with hypertension, nonadherence, smoking, alcohol intake, physical inactivity, chronic kidney disease, black race, and uncontrolled diabetes mellitus (Alencherry and Laffin, 2021). Treatment of hypertension involves improving medication adherence, detection, and correction of secondary hypertension and addressing other patient characteristics (Dhanaraj et. al., 2012; Rosa

ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 03, 2021

et. al., 2016). Renin–angiotensin aldosterone inhibitors are considered the mainstay treatment for hypertension in diabetic patients, especially in the presence of albuminuria (Bonino et. al., 2019). If we can control it in the initial stage we can also control the end-stage. The drugs that are used in hypertensive diabetes were initially discovered 60 years ago. There are multiple classes of antihypertensive medications used for the treatment of HTN; the most recommended classes used as first-line for treatment are: Thiazide-type diuretics, Calcium channel blockers, Angiotensin-converting enzyme (ACE) inhibitors and angiotensin II receptor blockers (ARBs) (Khalil and Zeltser, 2021). So in this article, we will discuss the use of these antihypertensive drugs for the treatment of hypertensive diabetic patients (Raikar, 2014). The focus of this article is to elaborate on the different pharmacological categories of antihypertensive drugs with three broad aspects: how they work? Is there any side of these drugs? What their effectiveness?

Materials and Methods

The study was conducted to analyze 100 patients in Basaveshwar Teaching and General Hospital, Gulbarga. The study was conducted for 100 days to analyze the ratio of admission and discharge of the patients with diabetes and blood pressure. Duration of stay, types of diseases, nature of infection investigation type, and demographic factors were analyzed during the study. Case record forms were used to analyze all the collected data of the patients under observation. Hypertensive drugs were given to the patients and then analyzed.

Investigations are done in the laboratory:

- Lipid checking
- Blood sugar analysis
- Microalbuminuria examination

There are the following drug indicators that were used during the study:

1. Facility indicator
2. Prescribing indicator
3. Complimentary indicator
4. Patient care indicator

ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 03, 2021

Criteria for inclusion:

The treatment of hypertension and diabetes together was analyzed for 100 patients between the age of 19-90.

Exclusion Criteria:

The patients below the age of 19 and above the age of 90 were not involved in the experiment. Because the patients of these ages may also have a combination of many other diseases.

Pregnant women are also not involved. Because they can have other interior problems that can cause other complex diseases.

Statistical Analysis:

The data were statistically analyzed by SPSS 17.5 software version after collection. The data was saved in soft copy using Microsoft excel and Microsoft word version 7. The tables were used to describe the data clearly (Laurent, 2017).

Age Groups (in years)	No. of Patients	Percentage (%)
19-29	2	2%
30-39	4	4%
40-49	13	13%
50-59	36	36%
60-69	24	24%
70-79	14	14%
80-89	7	7%

Table 1: Age wise number of patients and percentage

ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 03, 2021

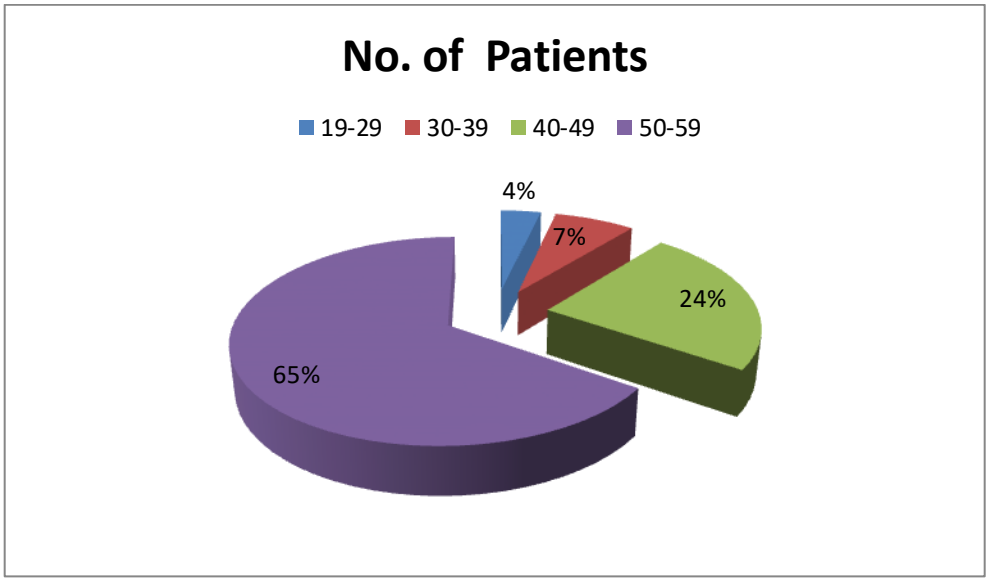

Figure 1: Pie chart representation of the number of patients according to the age group

Diagnosis	Number	Percentage (%)
Newly Diagnosed patients	10	10%
Previously Diagnosed patients	90	90%
Total	**100**	**100%**

Table 2: Distribution of patients according to the status of diagnosis

Sr. Number	Age	Diseases
1	**19-40**	URTI/DM/HTN/Balanoposthitis/ Vaginitis
2	**41-60**	DM/HTN/IHD/Balanoposthitis/ Vaginitis
3	**61-80**	EPILEPSY/DM/HTN

Table 3: Diseases according to age group

Days	Duration of Stay	Percentage (%)
0-6	72	72%

ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 03, 2021

7-12	20	20%
> 12	8	8%

Table 4: Distribution of patients according to the duration of stay in the hospital

No. of Drugs	No. of Patients	Percentage (%)
0-6	47	47%
7-12	49	49%
>12	4	4%

Table 5: Distribution of patients according to the average number of drugs administered

Blood Pressure	Average (mmHg)
Diastolic BP Admission	88
Diastolic BP Discharge	78
Systolic BP Admission	155
Systolic BP Discharge	130

Table 6: Distribution of patients according to Blood Pressure readings (SBP and DBP) at admission and discharge

Blood Sugar on Admission	No. of Patients	Percentage (%)
<99	5	5%
100-149	21	21%
150-199	20	20%
>199	54	54%

Table 7: Distribution of patients according to Blood Sugar on Admission

Drug Groups	Number of Patients	Percentage (%)
ACEIs	18	18%

ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 03, 2021

ARBs	8	8%
β Blockers	8	8%
CCBs	6	6%
ARBs + ACEIs	4	4%
β Blockers + ACEIs	6	6%
CCBs + ACEIs	9	9%
Diuretics + ACEIs	7	7%
αβ Blockers + ACEIs	3	3%
β Blockers + ARBs	1	1%
CCBs + ARBs	5	5%
Diuretics + ARBs	7	7%
CCBs + β Blockers	4	4%
Diuretics + β Blockers	1	1%
Diuretics + CCBs	2	2%
αβ Blockers + CCBs	1	1%
αβ Blockers + Diuretics	2	2%
ACEIs + ARBs + Diuretics	2	2%
ACEIs + Diuretics + CCBs	4	4%
ARBs + Diuretics + β Blockers	1	1%
ARBs + Diuretics + CCBs	1	1%
ACEIs + Diuretics + CCBs + αβ Blockers	1	1%
ARBs + β Blockers + CCBs + Diuretics	1	1%
Total	**100**	**100%**

Table 8 Distribution of patients according to the drugs administered

ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 03, 2021

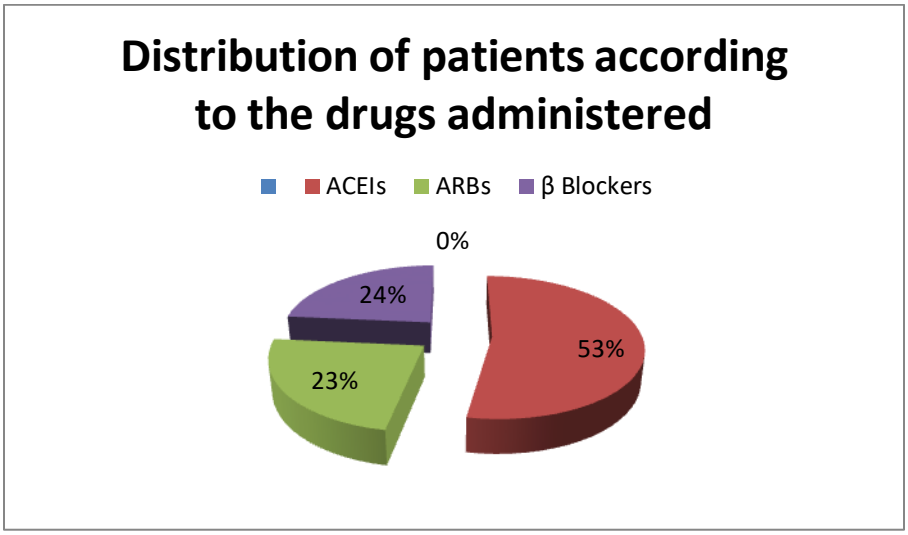

Figure 2: Pie chart to show the drugs administered

Discussion and Conclusion

The patients were grouped based on age during the observation. 2 out of the total 100 patients were between the age of 19-29, 4 of them were between the age of 30-39, 13 of them were 40-49, 36 of them were between the age of 50-59, 24 of them were between the age of 60 -69, 24 of them were between the age of 6-69, 14 of them were between the age 70-79 and 7 of them were between the age of 80-89. 10 out of the total 100 patients were newly diagnosed while 90 of them were previously diagnosed. The duration of 72% of the patients was 0-6 days, 20 of them stayed for 7-12 days and all others stayed for more than 12 days. Average diastolic BP at the time of admission and discharge was 88 and 78 respectively. Average systolic BP at the time of admission and discharge was 155 and 130 respectively. Blood sugar level for most of the patients was higher, some of them had normal blood sugar level and few of them got low blood sugar level. ACEIs, CCBs, Diuretics, and ARBs are the major drugs that were given to the patients. Fever, DM, and epilepsy were the common diseases observed in the patients that were treated with antihypertensive drugs and had diabetes and hypertension diseases (Mancia, 2006).

Some of the patients presented to dermatology OPD with candidial Balanoposthitis and Vaginitis. On examination they found to have Diabetes and associated hypertension. They were

ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 03, 2021

treated with oral Flucanazole 150 mg once in 3 days for 4 weeks and topical clotrimazole lotion and creams.

So, it can be stated that antihypertensive drugs are beneficial for hypertension but can create more complexities when the patients have diabetes and hypertension simultaneously. Their BP, Blood sugar level, and fever were examined on daily basis. The duration of the stay of all the patients was also recorded regularly. Moreover, the diseases that were originated with diabetes and hypertension were also examined and mentioned. The effect of the use of antihypertensive drugs was assessed and analyzed using Microsoft word, excel, and SPSSS software. The results indicated that diabetes and hypertension co-existed in a large number of patients. So, it can be stated that antihypertensive drugs are beneficial for hypertension but can create more complexities when the patients have diabetes and hypertension simultaneously.

References

1. Alencherry B, Laffin L J. (2021). Treatment of Hypertension in Patients with Diabetes Mellitus: a Contemporary Approach. Curr Cardiol Rep, . 2021 Jan 23;23(3):14. doi: 10.1007/s11886-021-01443-0.
2. Bonino B., Leoncini G., Cosmo S.D. , Greco E., Russo G.T., Giandalia A., Viazzi F., and Pontremoli R. (2019). Antihypertensive Treatment in Diabetic Kidney Disease: The Need for a Patient-Centered Approach. Medicina (Kaunas), 55(7): 382.
3. Dhanaraj E., Raval A., Yadav R., Bhansali A., and Tiwari P. (2012). “Prescription pattern of antihypertensive agents in T2DM patients visiting tertiary care centre in north India,” International Journal of Hypertension, vol. 2012, Article ID 520915, 9 pages,
4. Grossman, E., Messerli, F. H., &Goldbourt, U. (2000). High blood pressure and diabetes mellitus: are all antihypertensive drugs created equal?. Archives of internal medicine, 160(16), 2447-2452.
5. John, L. J., Devi, P., John, J., Arifulla, M., & Guido, S. (2011). Utilization patterns of central nervous system drugs: a cross-sectional study among the critically ill patients. Journal of neurosciences in rural practice, 2(02), 119-123.

ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 03, 2021

6. Keane, W. F., Anderson, S., Aurell, M., de Zeeuw, D., Narins, R. G., & Povar, G. (1989). Angiotensin converting enzyme inhibitors and progressive renal insufficiency: current experience and future directions. Annals of internal medicine, 111(6), 503-516.
7. Khalil H.and Zeltser R.(2021).Antihypertensive Medications. Treasure Island (FL): StatPearls Publishing; January 2021
8. Laurent, S. (2017). Antihypertensive drugs. Pharmacological research, 124, 116-125.
9. Mancia, G., Grassi, G., &Zanchetti, A. (2006). New-onset diabetes and antihypertensive drugs. Journal of hypertension, 24(1), 3-10.
10. Mills, K. T., Stefanescu, A., & He, J. (2020). The global epidemiology of hypertension. Nature Reviews Nephrology, 16(4), 223-237.
11. Raikar, S. R., Patil, S. B., Raikar, D. R., &Mantale, N. (2015). Drug utilization study of antihypertensive drugs in hypertensive diabetic patients in a tertiary care hospital.
12. Raikar, S., Jeevangi, S., &Vardhamane, S. H. (2014). A comparative study of ace-inhibitors with other antihypertensive drugs in hypertensive diabetic patients in a tertiary care hospital. Journal of Evolution of Medical and Dental Sciences, 3(26), 7190-7207.
13. Rosa J., Widimský P., Waldauf P. et al. (2016). "Role of adding spironolactone and renal denervation in true resistant hypertension: one-year outcomes of randomized PRAGUE-15 study," Hypertension, vol. 67, no. 2, pp. 397–403.
14. Saeedi, P., Petersohn, I., Salpea, P., Malanda, B., Karuranga, S., Unwin, N., ... & IDF Diabetes Atlas Committee. (2019). Global and regional diabetes prevalence estimates for 2019 and projections for 2030 and 2045: Results from the International Diabetes Federation Diabetes Atlas. Diabetes research and clinical practice, 157, 107843.
15. Tully, M. P., Ashcroft, D. M., Dornan, T., Lewis, P. J., Taylor, D., & Wass, V. (2009). The causes of and factors associated with prescribing errors in hospital inpatients. Drug safety, 32(10), 819-836.
16. Van Hoeven, K. H., & Factor, S. M. (1990). A comparison of the pathological spectrum of hypertensive, diabetic, and hypertensive-diabetic heart disease. Circulation, 82(3), 848-855.