ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 14, Issue, 11, pp.22857-22859, November, 2022
DOI: https://doi.org/10.24941/ijcr.44263.11.2022

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

COMPARISON OF EFFICACY OF AZILSARTAN WITH OLMESARTAN ON MICROALBUMINURIA IN HYPERTENSIVE DIABETICS: RANDOMIZED CONTROLLED TRIAL

[1,*]Dr. Deeksha Sharma, [2]Dr. Dinesh Kansal, [3]Dr. Dhiraj Kapoor and [4]Dr. Atal Sood

[1]MD Pharmacology, Dr RPGMC Kangra at Tanda, HP.
[2]Professor & HOD, Department of Pharmacology, Dr RPGMC Kangra at Tanda, HP.
[3]Professor & HOD, Department of Medicine, Dr RPGMC Kangra at Tanda, HP.
[4]Associate Professor, Department of Pharmacology, Dr. RPGMC Kangra at Tanda, HP.

ARTICLE INFO

Article History:
Received 18th August, 2022
Received in revised form
24th September, 2022
Accepted 15th October, 2022
Published online 30th November, 2022

Key words:

Azilsartan, Olmesartan, Microalbuminuria, Hypertensive Diabetics.

**Corresponding Author:*
Dr. Dinesh Kansal

ABSTRACT

Background: Angiotensin- -converting enzyme inhibitors (ACEIs) or angiotensin II receptor antagonists (ARBs) lead to a reduction in the cardiovascular mortality rate and an improvement in glomerular filtration rate in hypertensive diabetic patients. ***Objective:*** We want to evaluate effect of azilsartan with olmesartan on microalbuminuria in hypertensive diabetics. ***Material and Methods:*** A randomized, prospective, open label, comparative interventional study and conducted in the Department of Medicine and Pharmacology at Dr. R.P.G.M.C, Kangra at Tanda. The study stretched over a period of one year and microalbuminuria was measured at baseline and sixth month after initiating the treatment. Out of 69 patients, 35 patients in group A were prescribed tablet azilsartan 40 mg/day and 34 patients in group B patients were prescribed tablet olmesartan 20 mg/day along with chlorthalidone 12.5 mg/day and metformin 1 gm o.d in both the groups. ***Statistical analysis****:* Data was presented as mean $\pm$ SD. Student's t-test was used for comparing continuous variables between the two groups. P value < 0.05 was considered significant. ***Results:*** In group A, microalbuminuria reduced from baseline of 36.93±8.39 to 11.88±2.42 at 6-months ($p < 0.001$). In group B, values reduced from baseline of 23.30±11.34 to 18.33±6.39 at 6-months ($p < 0.001$). On intergroup comparison, microalbuminuria was reduced more in azilsartan group ($p<0.001$). ***Conclusion:*** Azilsartan is significantly better than olmesartan in reducing microalbuminuria in hypertensive diabetics.

Citation: ***Dr. Deeksha Sharma, Dr. Dinesh Kansal, Dr. Dhiraj Kapoor and Dr. Atal Sood.*** **2022.** "Comparison of efficacy of azilsartan with olmesartan on microalbuminuria in hypertensive diabetics: randomized controlled trial*". International Journal of Current Research*, 14, (11), 22857-22859.

INTRODUCTION

Hypertension (defined by the World Health Organization (WHO) as systolic blood pressure (SBP) and/or diastolic BP (DBP) ≥140/90 mmHg) is the leading risk factor for cardiovascular disease (CVD). Complications from hypertension are responsible for 9.4 million of the approximate 17 million CVD-related deaths; this includes 45% of deaths due to heart disease and 51% due to stroke (World Health Organisation, 2018). The risk for coronary heart disease, left ventricular hypertrophy, congestive heart failure, and stroke is much higher in patients with hypertension and T2DM than with either condition alone (Chen, 2011). Hypertension is one of the risk factors to renal dysfunctions which is associated with high morbidity and mortality (Chobanian, 2003). Long-term exposures to hypertension causes early renal damage resulting in the increased loss of albumin in the urine (Perneger, 1993).

Microalbuminuria (MAU) can be assessed early to see the effect of hypertension on the kidney. MAU is an elevated urine albumin level of 30 - 300 mg/day (Tobe, 2002). Collection of 24 hours urine sample is cumbersome and error prone. Therefore, it has been suggested that a single spot urine sample is enough for the diagnosis of MAU (Pugliese, 2011). To increase the accuracy, the urinary albumin can be adjusted to creatininuria. Thus, a urinary albumin-creatinine ratio (ACR) of 30-300 mg/g can be considered as microalbuminuria (Croal, 2001). Recent studies suggest that proactive intervention with strict control of blood glucose and BP levels and administration of angiotensin-converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs) can induce remission of moderately increased albuminuria to normal albuminuria and/or prevent progression to overt albuminuria for patients with type 2 diabetes (Bromfield, 2013). Evidence from experimental studies suggests that similarly to other ARBs, azilsartan medoxomil may induce excretion of urinary albumin.

This may possibly occur through the activation of several candidate mechanisms, including normalization of glomerular capillary pressure, inhibition of podocyte injury, inhibition of the proliferation of mesangial cells (Angeloni, 2016). There is no such comparative study conducted in our set up in patients of hypertensive diabetics. Hence, we want to find out which drug was more efficacious in reducing microalbuminuria.

MATERIALS AND METHODS

Study design and setting: The study was a randomized, prospective, open label, comparative interventional study. The present study was carried out in Department of Pharmacology, Department of Medicine, Dr. R.P.G.M.C. Kangra at Tanda, Himachal Pradesh, after approval by institutional ethics committee. The study was undertaken during the period April 2020 to October 2021.

- IEC approval vide letter no. - IEC/29/2020
- CTRI registration no. REF/2020/03/032497

Study population: The study population was the consenting adult patients of hypertension with type 2 diabetes mellitus. The patients were selected on an outpatient department basis.

Inclusion criteria: The study included all the newly diagnosed consenting adult patients of either gender of hypertension with type 2 diabetes mellitus.

Exclusion Criteria

- Not willing to give written informed consent.
- Type 1 DM.
- Congestive heart failure NYHA classes II-IV.
- Recent major cardiovascular events (<6 months prior to randomization).
- Pregnant females.
- Known hypersensitivity to drugs.

Study duration: Total duration was one year and microalbuminuria level was monitored at baseline and sixth month after initiating the treatment. Detailed history of the patients was elicited, clinical examination was done.

Once diagnosed, the patients were informed about the study through the patient information sheet in their own language and were allowed to understand thoroughly about the study and related aspects. After a written informed consent, the participants were assigned to either group A or B, based on computer generated random numbers through simple randomization technique. All the patients were taking tab metformin (1 gm o.d).

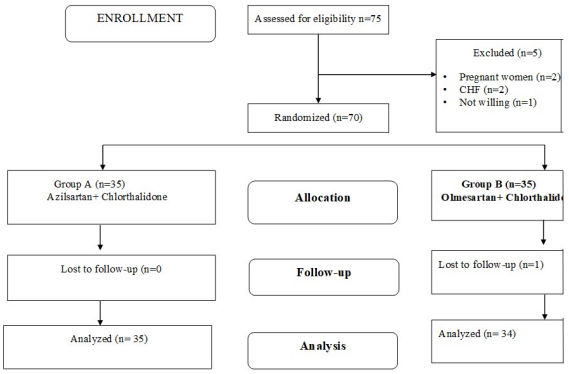
Group-A	**Group-B**
Azilsartan 40 mg once a day in morning + Chlorthalidone 12.5mg once a day in morning	Olmesartan 20 mg once a day in morning. + Chlorthalidone 12.5mg once a day in morning.

Statistical analysis

- Categorical data was expressed as frequency and percentages and analyzed by using Chi square test.
- Quantitative variables were expressed as mean ± SD and percentages.
- Student's t-test was used for comparing continuous variables between the two groups.
- P value < 0.05 was considered significant.

MEASUREMENTS OF OUTCOME

On completion of 6 month of intervention the outcome was assessed on the basis of reduction in microalbuminuria.



RESULTS

As shown in Table 1, In group A and B**,** majority of patients were > 60 years of age group. 21(60%) patients in group A and 16 (47%) in group B were males. 14 (40%) patients in group A and 18 (53%) in group B were females. 24(69%) patients in group A and 20(59%) patients in group B had family history of hypertension. 15(43%) patients in group A and 16(47%) patients in group B had family history of diabetes. 17(49%) patients in group A and 16 (47%) patients in group B had history of smoking. 13(37) patients in group A and 9 (26%) patients in group B had history of alcohol intake.

Table 1. Baseline characteristics

	GROUP A (n=35) Azilsartan + Chlorthalidone	GROUP B (n=34) Olmesartan + Chlorthalidone	P value
Age in years- 31-40 yrs	0	2 (6%)	0.412
40- 50 yrs	1(3%)	2 (6%)	
50-60 yrs	10 (29%)	7 (21%)	
> 60 yrs	24 (69%)	23(68%)	
Gender Male	21 (60%)	16 (47%)	0.281
Female	14(40%)	18 (53%)	
Family H/O Hypertension	24 (69%)	20 (59%)	0.400
Family H/O Diabetes	15 (43%)	16(47%)	0.726
Smoker	17 (49%)	16 (47%)	0.900
Alcoholic	13(37%)	9 (26%)	0.342
Body Mass Index (BMI)	25.05±1.82	25.83±2.73	0.167

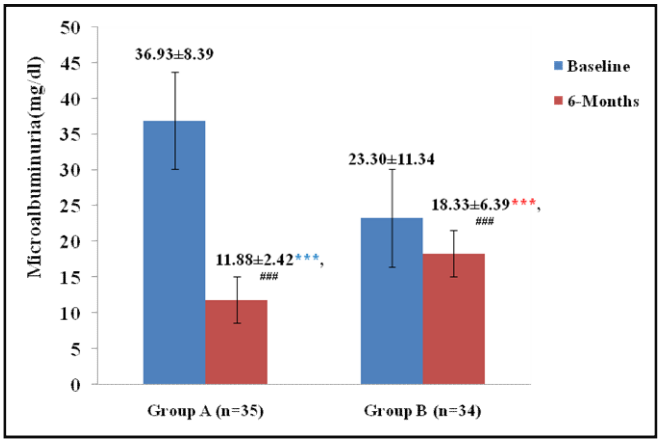
Table 2. Comparison of microalbuminuria between two groups

Microalbuminuria	Group A (n=35)	Group B (n=34)	p-value# Intergroup
Baseline	36.93±8.39	23.30±11.34	<0.133
6-Months	11.88±2.42***	18.33±6.39***	<0.001###
p value (Baseline vs. 6-months	<0.001***	<0.001***	

Data expressed as mean ±SD
#Un paired student t-test (Intergroup comparison)
*Paired student t-test (Intra group comparison)

MICROALBUMINURIA

As shown in Table 2, in group A, values reduced from baseline of 36.93±8.39 to 11.88±2.42 at 6-months (p <0.001) and in group B, values reduced from baseline of 23.30±11.34 to 18.33±6.39 at 6-months (p <0.001).



Comparison of microalbuminuria levels in two groups

There was progressive significant decrease in microalbuminuria levels in both the groups over 6 months of period. Moreover, there was greater reduction in microalbuminuria observed in azilsartan group as compared to olmesartan group ($p < 0.001$).

DISCUSSION

Angiotensin receptor blockers (ARBs) that specifically block the AT1 receptor offer the potential to reduce proteinuria in patients with type 2 diabetes mellitus. Similar observations have been made by Suehiro T[10]. *et al*. (2021), Husna Siddiqua[11] *et al*. (2021) regarding reduction of microalbuminuria in hypertensive patients. In our study, we compared the effect of azilsartan with olmesartan in hypertensive diabetics. Both azilsartan and olmesartan resulted in a significant reduction in microalbuminuria in hypertensive diabetics. Moreover, azilsartan (40 mg) showed significantly greater reduction in microalbuminuria level in comparison to olmesartan (20 mg) over 6 month of period in the study.

LIMITATIONS:

This study being post graduate thesis, the follow-up could not be extended beyond 6 months. Follow-up for longer duration would have added more evidence about safety and efficacy of our drugs.

CONCLUSION

Azilsartan showed a statistically significant reduction in microalbuminuria level than olmesartan.

FINANCIAL DISCLOSURE: No unnecessary financial burden was put on the patient for the treatment and investigations at any point of time throughout the study period. I did not get any financial benefit from any pharmaceutical company or any other source for this study.

CONFLICT OF INTEREST: No conflict of interest pertaining to any part of the study.

REFERENCES

World Health Organisation, "Cardiovascular diseases (CVDs)," 2018, http: // www. who . int/mediacentre/factsheets/fs317/en/

Chen, G. F. A. McAlister, R. L. Walker, B. R. Hemmelgarn, and N. R. C. Campbell, "Cardiovascular outcomes in framingham participants with diabetes," Hypertension, vol. 57, no. 5, pp. 891–897, 2011.

Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr, *et al*. Prevention, Detection , Evaluation , and Treatment of High Blood Pressure. The JNC 7 Report. JAMA 2003; 289 (19): 2560-72. (3):305-13.

Perneger TV, Nieto FJ, Whelton PK, Klag MJ, Comstock GW, Szklo M.A Prospective Study of Blood Pressure and Serum Creatinine Results From the Clue. JAMA 1993; 269: 488–93.

Tobe SW, Mcfarlane PA, Naimark DM. Microalbuminuria in diabetes mellitus. CMAJ 2002;167 (5):499–503.

Pugliese G, Solini A, Fondelli C, Trevisan R, Vedovato M, Nicolucci A, *et al*. Reproducibility of albuminuria in type 2 diabetic subjects. Findings from the Renal Insufficiency and Cardiovascular Events (RIACE) study. Nephrol Dial Transplant 2011; 26 (12):3950–4.

Croal BL, Mutch WJ, Clark BM, Dickie A, Church J, Noble D, *et al*. The clinical application of a urine albumin:creatinine ratio point-of-care device. Clin Chim Acta 2001; 307: (1-2); 15–21.

Bromfield S. and P. Muntner, "High blood pressure: the leading global burden of disease risk factor and the need for worldwide prevention programs," Current Hypertension Reports, vol. 15, no. 3, pp. 134–136, 2013.

Angeloni, E. "Azilsartan medoxomil in the management of hypertension: an evidence-based review of its place in therapy," Core Evidence, vol. 11, pp. 1–10, 2016.

Suehiro T, Tsuruya K, Yoshida H, Tsujikawa H, Yamada S, Tanaka S, Tsuchimoto A, Eriguchi M, Fujisaki K, Torisu K, Nakano T, Kitazono T. Stronger Effect of Azilsartan on Reduction of Proteinuria Compared to Candesartan in Patients with CKD: A Randomized Crossover Trial. Kidney Blood Press Res. 2021;46(2):173-184. doi: 10.1159/000512365. Epub 2021 Mar 5. PMID: 33677450.

Siddiqua, Husna & Subhani, Ghulam. (2021). A randomized, prospective, open label comparative study of the efficacy of azilsartan and ramipril in the management of hypertension in patients with type-2 diabetes mellitus. Int. J. Basic Clini. Pharmacol. 10. 10.18203/2319-2003. Ijbcp20214039.

****