

Comparison between the Efficacies of Amlodipine & Cilnidipine in the Treatment of Hypertension in Adult Patients

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Abstract

Original Research Article

Introduction: Calcium channel blockers are proposed to play a vital role for the management and control of hypertension. Dihydropyridine-type calcium channel blockers like Amlodipine are frequently used because for their strong antihypertensive and minimal adverse side effects. However, it is commonly associated with the causation of pedal edema among the patients. Cilnidipine, another novel new generation calcium channel blocker is presumed to cause lesser pedal edema with a satisfactory clinical control of hypertension along with negligible side effects.

Objective: The main objective of this study was to compare between the efficacies of Amlodipine Cilnidipine in treating the hypertensive patients. **Methods:** This comparative study was conducted in the Department of Cardiology, Rajshahi Medical College Hospital, Rajshahi, Bangladesh during the period from January 2018 to December 2018. The present study included assessment of 80 hypertensive patients that were undergoing treatment for the same. Auscultatory method with standard mercury sphygmomanometer was used for the measurement of the blood pressure. All the 90 patients were divided into two study groups with 40 patients in each group. The first group comprised of patients who were prescribed amlodipine 5–10 mg/day while the other group included patients who were given cilnidipine 10–20 mg/day orally as a treatment protocol for hypertension. The mean values of Systolic blood pressure and Diastolic blood pressure during check-up were recorded and assessed. All the results were analyzed by SPSS software. **Results:** The mean SBP in the Amlodipine group patients and cilnidipine group patients was 139.1 and 144.2 mm of mercury respectively. The mean DBP in the Amlodipine group patients and in the cilnidipine group patients was 80.2 and 85.3 mm of mercury respectively. Non-significant results were obtained while comparing the mean SBO and DBP among patients of the two study groups. 28 patients in amlodipine group and 5 patients in the cilnidipine group showed the presence of edema. **Conclusion:** It can be concluded that both the drugs significantly reduced BP, but cilnidipine found superior to amlodipine for reducing systolic BP and equally efficacious in reducing DBP.

Keywords: Cilnidipine, Amlodipine; Systolic Blood Pressure; Diastolic.

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INTRODUCTION

Hypertension is one of the most common diseases afflicting humans throughout the world and due to the associated morbidity and mortality and the cost to society, it is an important public health challenge as well [1]. HTN may be defined as that the level of blood pressure (BP) at which the institution of therapy reduces BP-related morbidity and mortality [2]. HTN is graded as mild/Stage/Grade 1 (systolic BP between 140 and 159 and diastolic BP between 90 and 99), moderate/Stage/Grade 2 (SBP between 160 and 179 and DBP between 100 and 109), and severe/Stage/Grade

3 (SBP \geq 180 and DBP \geq 110) [3]. HTN doubles the risk of cardiovascular diseases including coronary heart disease, congestive heart failure, ischemic and hemorrhagic stroke, renal failure, and peripheral arterial disease if not effectively treated [4]. In a study they indicated that approximately 14% reduction in the risk of stroke and ischemic attacks occurs by fall in approximately 2-mmHg of average DBP. The same study also showed a simultaneous 6% reduction in risk of the development of coronary artery disease. Data from various other studies also indicate that lowering of BP might also be beneficial [5]. Several classes of antihypertensive agents have been in clinical use,

including diuretics, α -blockers, β -blockers, angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, and organic calcium channel blockers (CCBs). All these drugs are being currently used in the treatment of HTN and various disease conditions of the heart either alone or in combination [6]. One of the CCBs with outstanding pharmacokinetic and pharmacodynamic profile is amlodipine. The only problem encountered with this medication is the presence of peripheral edema. Data from various studies show that approximately up to 30% of the hypertensive cases on amlodipine show the presence of peripheral edema while cilnidipine a newer generation of CCB is known to inhibit sympathomimetic activity [7]. Noted that, although a single drug treatment may be effective in controlling of blood pressure, some cases might require prescription of more than one drug for controlling the BP [8]. But our study was conducted as mono drug treatment.

OBJECTIVES

General Objective

To compare between the efficacies of Amlodipine Cilnidipine in treating the hypertensive patients

Specific Objective

To assess the major side effects of Amlodipine Cilnidipine in treating the hypertensive patients

METHODS & MATERIALS

This comparative study was conducted in the Department of Cardiology, Rajshahi Medical College Hospital, Rajshahi, Bangladesh during the period from January 2018 to December 2018. Ethical approval was taken from the institutional ethical committee and written consent was obtained after explaining in detail the entire research protocol. Inclusion criteria: a) New cases which were diagnosed as suffering from hypertension with Blood Pressure (BP) more than 140/90 mm of mercury b) Patients in between the group of 35 to 70 years c) Patients without any known drug allergy d) Patients without history of any other systemic illness and e) Patients with absence of pre-existing edema, nephritic syndrome, anaemia. Consultant physician examined all the patients and measured their blood pressure in the right arm in the sitting posture. Auscultatory method with standard mercury sphygmomanometer was used for the measurement of the blood pressure. Assessment of pedal edema was done by the clinical methods over the medial malleolus of both legs. All the cases were considered as positive for pedal edema in which pedal edema was present on either of the legs. Complete recording of all the demographic, personal and medical details of the patients was done after their initial screening. All the 80 patients were divided into two study groups with 40 patients in each group. The first group comprised of

patients who were prescribed amlodipine 5–10 mg/day while the other group included patients who were given cilnidipine 10–20 mg/day orally as a treatment protocol for hypertension. All the patients were advised to take the prescribed medication as per instructions given by the consultant physician. Screening of all the patients was done every fortnight for the presence or absence of edema and control of blood pressure over a period of three months. The mean values of Systolic blood pressure (SBP) and Diastolic blood pressure (DBP) during check-up were recorded and assessed. All the results were analyzed by SPSS software. Chi-square test and student t test were used for the assessment of level of significance. P-value of less than 0.05 was taken as significant.

RESULT

In our study a total of 80 patients were included. They were divided in two study groups with 40 patients in each group. Mean age of the patients in the Amlodipine group was 51 ± 3 years while in the Cilnidipine group; the mean age of the patients was 52 ± 2 years. Out of 40 patients of Amlodipine group, 17 were male and 23 were female and in Cilnidipine group 18 were male and 22 were female. So the female are dominating the total study population. Table II and Figure II we showed the comparative evaluation of antihypertensive efficacy of amlodipine with cilnidipine. The mean SBP in the Amlodipine group patients and in the cilnidipine group patients was 141.26 and 143.12 mm of mercury respectively. The mean DBP in the Amlodipine group patients and in the cilnidipine group patients was 80.07 and 83.23 mm of mercury respectively. Non-significant results were obtained while comparing the mean SBO and DBP among patients of the two study groups (p -value < 0.05). Figure II showed patients presenting with pedal edema in both groups. In total 23 patients in amlodipine group and 7 patients in the cilnidipine group showed the presence of edema. All these data were collected at the time of releasing the patients from the hospital after 1-2 weeks of treatment.

Table-I: Demographic details of participants (N=80)

Component	Amlodipine	Cilnidipine
	n=40	n=40
Mean age (years)	51 ± 3	52 ± 2
Males	17	18
Females	23	22

Table-II: Evaluation of antihypertensive efficacy of amlodipine with cilnidipine (N=80)

Blood pressure	Amlodipine	Cilnidipine	p value
	n=40	n=40	
SBP	141.26	143.12	0.652
DBP	80.07	83.23	0.831

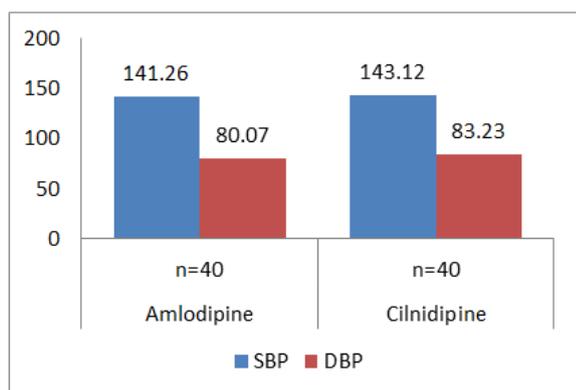


Fig-I: Antihypertensive efficacy of amlodipine & cilnidipine (N=80)

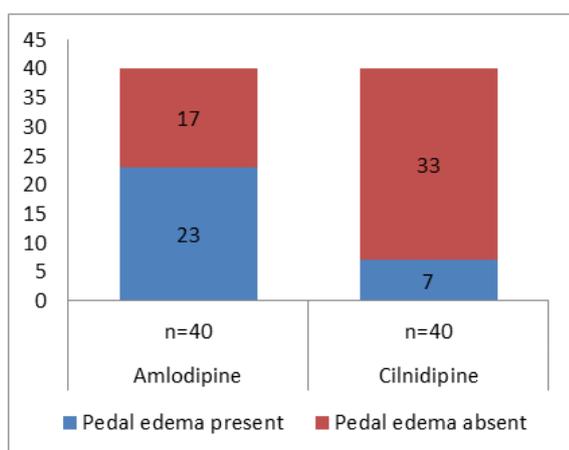


Fig-II: Patients presenting with pedal edema in both groups (N=80)

DISCUSSION

The main objective of this study was to compare between the efficacies of Amlodipine Cilnidipine in treating the hypertensive patients. Cessation of the amlodipine therapy is the usual protocol followed in controlling the peripheral edema observed in hypertensive patients with amlodipine-induced edema [9]. Although the incidence of edema is relatively lower with other CCBs when compared to amlodipine, replacement antihypertensives in these patients are typically drawn from a different class such as a thiazide diuretic or angiotensin converting enzyme inhibitor, in an attempt to avoid recurrence of edema. Cilnidipine is one of the CCBs which are approved for the therapy of essential hypertension [10]. In the present study, we observed that both amlodipine and cilnidipine exhibited about equal efficacy in controlling the BP of the patients on hypertension. However, incidence of peripheral edema was associated with amlodipine in comparison with cilnidipine (Figure II). Adake P *et al.* assessed and compared the efficacy amlodipine with cilnidipine in treating antihypertensive patients and also the incidence of pedal edema in those patients. In tertiary care centre of Karnataka, they analyzed 60 patients who were newly diagnosed with hypertension. They divided the patients into two study groups like us.

The first group included 30 patients who were put on amlodipine therapy while the other group included 30 patients who were put on cilnidipine. They observed that pedal edema was present in 63.3 percent of the patients receiving amlodipine therapy while it was present only in 6.66 percent of the patients on cilnidipine therapy. They observed significant difference in the incidence of pedal edema in between the patients of the two study groups. However, they observed equal efficacy of both amlodipine and cilnidipine in reducing blood pressure in hypertensive individuals [11]. Shetty R *et al.* assessed whether edema caused by amlodipine therapy was resolved by cilnidipine while maintaining adequate control of hypertension. They conducted a prospective study on 27 patients who were diagnosed with essential hypertension with presence of amlodipine-induced edema. In all the cases, they substituted Amlodipine therapy with cilnidipine therapy. At the onset of the study and after one month of the study, clinical assessment of ankle edema, blood pressure, and pulse rate was done. Resolution of edema took place in all the 27 cases. Along with this, they observed a significant decrease in the bilateral ankle circumference and body weight. However, they didn't observe any significant defence in the mean arterial blood pressure and pulse rate. From the results, they concluded that in treating antihypertensive for patients with amlodipine-induced edema, Cilnidipine is an acceptable alternative [12]. Suppression oxidative stress and exertion of renoprotective effect by cilnidipine was hypothesized by Soeki T *et al.* They assessed a total of 35 hypertensive patients that received renin-angiotensin system inhibitor. They randomly divided these 35 patients into two study group. One group consisted of patients that were given cilnidipine (n= 18) while the other group consisted of patients that were given amlodipine (n= 17). 130/85 mm Hg was the targeted BP set. A significant reduction in the SBP and DBP was seen in both the study groups when assessed after six months. They observed non-significant difference in the efficacy of the two drugs is controlling the BP. However, in terms of renoprotective effect, they observed that cilnidipine exerted a higher effect by the virtue of its antioxidative properties [13]. In our study we found about the same efficacy of Amlodipine and Cilnidipine in treatment of hypertension. But Cilnidipine showed some superiority over Amlodipine because of less side effect of pedal edema.

CONCLUSION AND RECOMMENDATIONS

In this study we found hypertensive patients got equal efficacy by both Amlodipine and Cilnidipine in reduction of blood pressure although incidence peripheral edema is higher in patients on amlodipine. So we would like to recommend for using Cilnidipine with more confidence in the treatment of hypertension.

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