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## **Assessment of effects of antihypertensive agents on the quality of life in diabetic hypertensive patients**

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**Abstract---**Background: Hypertension affects a significant number of population and many of these affected individuals have no symptoms. The present study was conducted to assess effects of antihypertensive agents on the quality of life in diabetic hypertensive patients. Materials & Methods: This was a hospital based cross sectional study. Diagnosed patients of Type 2 diabetes mellitus with hypertension were included in study. Result: 96 diabetic hypertensive patients of both genders were divided into 4 groups based on antihypertensive medicines- group I comprises those taking amlodipine (2.5–10 mg/day), group II taking ramipril (2.5–10 mg/day), group III taking telmisartan (40–80 mg/day) and group IV taking combination of ramipril (1.25–5 mg/day) and telmisartan (20–40 mg/day) (RT). Parameters such as blood pressure (BP), pulse rate, blood sugar level, glycated hemoglobin (HbA1c) and Quality of Life Instrument for Indian Diabetes Patients(QOLIID) questionnaire at baseline and then at the 24<sup>th</sup> week of therapy. QoL of the patients was assessed by using the QOLIID questionnaire Results: Group I had 12 males and 12 females, group II had 14 males and 10 females, group III had 15 males and 9 females and group IV had 10 males and 14 females. The mean SBP (mm Hg) was 143.2, 141.3, 140.4 and 143.8, DBP (mm Hg) was 89.4, 87.2, 88.1 and 89.0, pulse rate (beats/min) was 82.4, 85.3, 86.2 and 83.2, HbA1C was 7.8, 7.4, 7.2 and 7.0 and FBS (%) was 168.2, 165.3, 164.3 and 165.2 in group I, group II, group III and group IV respectively. The difference was significant (P< 0.05). There was significant difference in parameters such as physical health, physical endurance, general

physical, treatment satisfaction, symptom botherness, financial worries, mental health and diet satisfaction recorded at 0 week and 24 weeks in all groups ( $P < 0.05$ ). Conclusion: All the drugs such as amlodipine, ramipril, telmisartan, and a combination of RT are equally effective in improving BP and QoL among diabetic hypertensive patients.

**Keywords**---amlodipine, diabetes mellitus, hypertension, quality of life.

## Introduction

Diabetes mellitus (DM) is a chronic noncommunicable disease requiring long-term management. Hypertension (HT) is a common comorbid condition associated with it adversely affecting the general health of these patients.<sup>1</sup> Hypertension affects a significant number of population and many of these affected individuals have no symptoms. Poorly controlled chronic hypertension (either systolic or diastolic) can lead to sexual dysfunctions, stroke, congestive heart failure, myocardial infarction and renal failure.<sup>2</sup> A person is said to be hypertensive when there is a persistent and sustained increase in the resting blood pressure above or equal to ( $\geq$ ) 140/90 mm Hg. Hypertension is considered to be one of the most prevalent diseases in elderly patients (usually 60 years and above). As hypertensive patients are more likely to have multiple comorbid conditions and are required to maintain stringent control of blood pressure. The quality of health in an individual can be assessed by using the quality of life (QoL) scale at regular intervals.<sup>3</sup> According to the WHO QoL is defined as individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. Studies have shown that QoL in diabetic patients is not adequate as per the standard guidelines of the WHO.<sup>4</sup> The present study was conducted to assess effects of antihypertensive agents on the quality of life in diabetic hypertensive patients.

## Materials & Methods

The present study comprised of 96 diabetic hypertensive patients of both genders. This study was conducted in a Tertiary care hospital, Bolangir, Odisha from Feb 2020 to Jan 2021. The patients those had given consent been constituted the study population. The patients with impaired mental function and critically ill patients were excluded from the study. Data such as name, age, gender etc. was recorded. Patients were divided into 4 groups based on antihypertensive medicines- group I comprises those taking amlodipine (2.5–10 mg/day), group II taking ramipril (2.5–10 mg/day), group III taking telmisartan (40–80 mg/day) and group IV taking combination of ramipril (1.25–5 mg/day) and telmisartan (20–40 mg/day) (RT). Parameters such as blood pressure (BP), pulse rate, blood sugar level, glycated hemoglobin (HbA1c) and Quality of Life Instrument for Indian Diabetes Patients (QOLIID) questionnaire at baseline and then at the 24<sup>th</sup> week of therapy. QoL of the patients was assessed by using the QOLIID questionnaire. Data thus obtained were subjected to statistical analysis. P value  $< 0.05$  was considered significant.

## Results

Table I Distribution of patients

Groups	Group I	Group II	Group III	Group IV
Drugs	amlodipine	ramipril	telmisartan	ramipril and telmisartan
M:F	12:12	14:10	15:9	10:14

Table I shows that group I had 12 males and 12 females, group II had 14 males and 10 females, group III had 15 males and 9 females and group IV had 10 males and 14 females.

Table II Baseline parameters

Parameters	Group I	Group II	Group III	Group IV	P value
SBP	143.2	141.3	140.4	143.8	0.91
DBP	89.4	87.2	88.1	89.0	0.80
Pulse rate	82.4	85.3	86.2	83.2	0.92
HbA1C	7.8	7.4	7.2	7.0	0.11
FBS	168.2	165.3	164.3	165.2	0.93

Table II, graph I shows that mean SBP (mm Hg) was 143.2, 141.3, 140.4 and 143.8, DBP (mm Hg) was 89.4, 87.2, 88.1 and 89.0, pulse rate (beats/min) was 82.4, 85.3, 86.2 and 83.2, HbA1C was 7.8, 7.4, 7.2 and 7.0 and FBS (%) was 168.2, 165.3, 164.3 and 165.2 in group I, group II, group III and group IV respectively. The difference was significant ( $P < 0.05$ ).

Graph I Baseline parameters

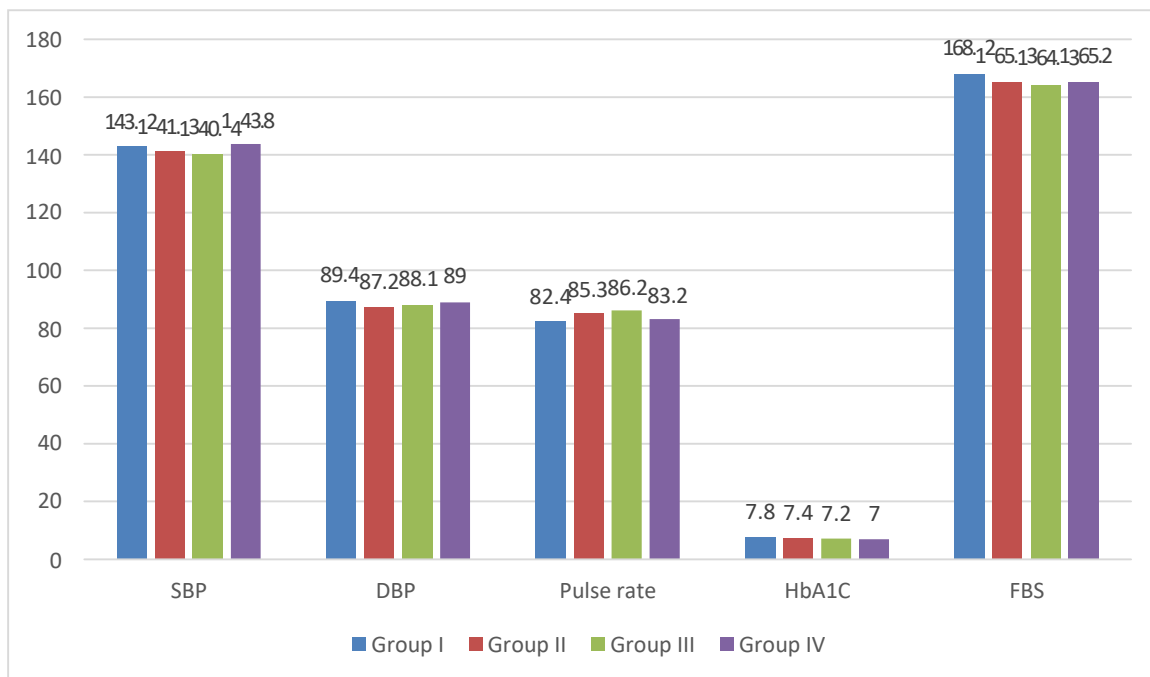


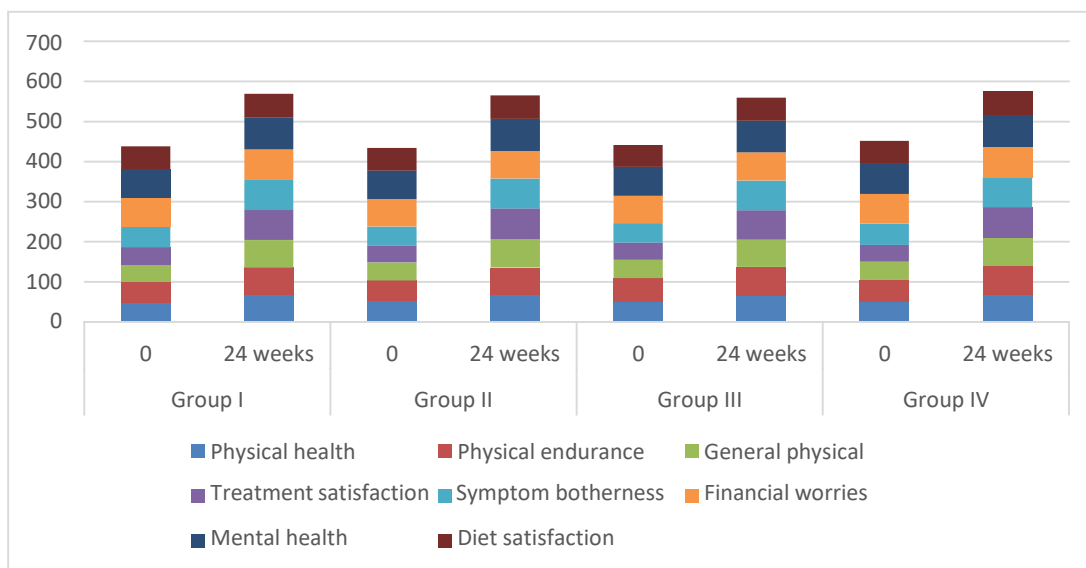
Table III Quality of life instrument in diabetic patients

QOLIID	Group I		Group II		Group III		Group IV		P value
	0	24 weeks	0	24 weeks	0	24 weeks	0	24 weeks	
Physical health	48.5	67.3	52.3	68.2	51.4	66.5	51.3	67.5	0.05
Physical endurance	50.2	68.3	51.4	67.2	57.8	70.2	53.2	71.0	0.04
General physical	43.6	68.2	44.3	71.0	45.3	68.5	45.3	72.1	0.01
Treatment satisfaction	43.6	75.4	42.3	76.5	42.9	73.2	42.7	75.2	0.04
Symptom bothersness	51.3	76.4	47.5	74.2	49.0	74.2	52.3	74.2	0.05
Financial worries	73.2	74.8	68.4	69.2	68.2	70.1	74.2	75.4	0.04
Mental health	71.2	79.3	71.2	80.4	72.3	79.6	75.2	81.5	0.01
Diet satisfaction	56.4	59.3	56.7	58.2	54.3	57.2	57.4	58.2	0.01

Table III, graph II shows that there was significant difference in parameters such as physical health, physical endurance, general physical, treatment satisfaction,

symptom bothersness, financial worries, mental health and diet satisfaction recorded at 0 week and 24 weeks in all groups ( $P < 0.05$ ).

Graph II Quality of life instrument in diabetic patients



## Discussion

It is recognized that some adverse drug reactions are restricted to particular drugs, while some are generalized and nonspecific adverse drug reactions.<sup>5,6</sup> Based on the hypothesis that the administration of relatively low doses of multiple medications results in a higher tolerability than administration of relatively high doses of one medication, current clinical guidelines for the treatment of hypertension recommend combination therapies if needed, thus increasing the potential for polypharmacy in hypertensive patients.<sup>7</sup> The management of hypertensive patients should consider the impact of antihypertensive drugs on patients' sexual functions, the deterioration of which may result in reduced adherence to treatment.<sup>8</sup> Quality of life is recognized as a multifactorial variable, which encompasses adequate sexual functions as part of its components; it is important to pay attention to the symptomatic wellbeing, activity and sexual functions of these hypertensive adult male patient.<sup>9,10</sup> The present study was conducted to assess effects of antihypertensive agents on the quality of life in diabetic hypertensive patients.

We found that group I had 12 males and 12 females, group II had 14 males and 10 females, group III had 15 males and 9 females and group IV had 10 males and 14 females. Bhardwaj et al<sup>11</sup> assessed the effects of antihypertensive agents (viz., amlodipine, ramipril, telmisartan, and ramipril with telmisartan) on the blood pressure (BP) and QoL. Patients were randomly assigned antihypertensive agents, namely, amlodipine, ramipril, telmisartan, and a combination of ramipril with telmisartan (RT) in four groups. They were evaluated for BP, blood sugar level, and QoL at baseline and 24<sup>th</sup> week. After 24 weeks of therapy, systolic BP (SBP)

and diastolic BP (DBP) were significantly reduced in all groups. In amlodipine, there was a mean percentage fall of SBP by 15.85% (confidence interval [CI]: 21.38–28.13) and DBP by 11.22% (CI: 8.41–12.70); in ramipril – 14.4% (CI: 18.61–25.15) and 12.4% (CI 8.88–13.99); telmisartan – 18.4% (CI: 24.89–10.79) and 14.6% (CI 10.79–16.24); and in RT group, SBP 17.7% (CI: 23.38–29.18) and DBP 12.4% (CI: 9.05–13.02). QoL score increased by 30.56% (CI: 14.30–10.90), 30.94% (CI: 14.21–10.68), 28.07% (CI: 14.89–11.20), and 28.84% (CI: 15.49–11.77), in respective groups ( $P < 0.0001$ , each). However, they were nonsignificant between the study groups.

We observed that mean SBP (mm Hg) was 143.2, 141.3, 140.4 and 143.8, DBP (mm Hg) was 89.4, 87.2, 88.1 and 89.0, pulse rate (beats/min) was 82.4, 85.3, 86.2 and 83.2, HbA1C was 7.8, 7.4, 7.2 and 7.0 and FBS (%) was 168.2, 165.3, 164.3 and 165.2 in group I, group II, group III and group IV respectively. The difference was significant ( $P < 0.05$ ). Akinyede et al<sup>12</sup> in their study a total of one hundred and fifty-nine recruited hypertensive adult male patients. The respondents were between 30 and 98 years of age, (mean of  $59 \pm 11.1$  years). Blood pressure recorded was during their initial medical diagnosis for hypertension. Systolic blood pressure recorded was between 128 and 194 mmHg (mean of  $162 \pm 16.4$  mmHg), while their diastolic blood pressure was between 78 and 120 mmHg (mean of  $95 \pm 10.7$  mmHg). The highest occurrence of sexual dysfunctions was associated with calcium-channel blockers in 32 (20.1%) patients, followed by diuretics in 27 (17.0%) and, angiotensin-converting enzyme inhibitors in 20 (12.6%) patients.

We found that there was significant difference in parameters such as physical health, physical endurance, general physical, treatment satisfaction, symptom bothersness, financial worries, mental health and diet satisfaction recorded at 0 wee and 24 wees in all groups ( $P < 0.05$ ). Matchar et al<sup>13</sup> reported that ACEI and ARB were comparable with respect to their effects on the QoL score.

## Conclusion

Authors found that all the drugs such as amlodipine, ramipril, telmisartan, and a combination of RT are equally effective in improving BP and QoL among diabetic hypertensive patients.

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