Effect of Antihypertensive Medications on the Subjective Quality of Life in Previously Untreated Hypertensive Patients

Nishith Revappala Sekhar, Mukta Chowta, Kallige Nithyananda Chowta, Sahana Devadas Acharya, Kudgi Ashok Shenoy
Department of Medicine and Pharmacology, Kasturba Medical College, Mangalore, Manipal University, Karnataka, INDIA.

ABSTRACT

Objective: This study was done with the main objective of evaluating the effect of antihypertensive medications on the quality of life in patients who were previously untreated. **Methods**: In this prospective study, 114 patients were included. WHO-QOL BREF questionnaire was used to evaluate the quality of life. **Results**: The study reported no significant difference in any of the four domains from baseline to end of the study scores. Although there was an increase in physical health and psychological function domain scores, the increase was not statistically significant. The results also noted that patient's perception of overall quality of life did not significantly improve over the study period. However, the patient's perception of satisfaction with health significantly improved over the study period. The domain scores had a positive correlation with hypertension control. Physical health and environmental condition domains showed a statistically significant correlation with mean change in blood pressure. The quality of life did not vary significantly in different age groups. The quality of life did not significantly differ between different classes of antihypertensive drugs used. **Conclusion**: The quality of life in hypertensive patients who were previously untreated significantly correlated with hypertension control. There was no difference among different classes of drugs or different age group as for as the effect on quality of life is concerned.

Key words: Quality of life, Hypertension, WHO-QOL BREF questionnaire, Antihypertensives, Scores.

Correspondence :

Dr. Mukta N Chowta,

Professor and Head of Pharmacology, Kasturba Medical College, Mangalore-575001, Manipal University, Karnataka, INDIA

E-mail: muktachowta@yahoo.co.in

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INTRODUCTION

The quality of life (QOL) as an indicator for health outcome measurements is gaining importance, especially with reference to the chronic diseases including hypertencion.[1] In hypertension, QOL is affected not only by the diasease perse, but also by the adverse effects of antihypertensive medication. It is an important consideration in antihypertensive therapy because clinicians have to initiate drug therapy and follow mainly asymptomatic patients for long periods of time. The antihypertensive medications differs in their efficacy as well as tolerability profile. In addition, the efficacy and tolerability profile of these medication may vary from individual to individual, thereby complicating the physicians decision in the selection of appropriate drug. Labelling a patient as hypertensive itself may lead to negative QOL consequences. Also, there is emerging evidence to show that hypertension may not always be an asymptomatic condition. Only a few patients feel better on antihypertensive medications when they were unaware of their previous hypertensive status.[2] It has been shown that health related quality of life (HRQOL) is diminished in patients with hypertension when compared to that of community based controls. It has also been shown that HRQOL decreases over time in hypertensive patients. The impact of disease on HRQOL is especially relevant for a disease such as hypertension, as treatments to control hypertension is lifelong and may also worsen HRQOL.[3]

The most widely accepted model of HRQOL is based on the World Health Organization's definition of quality of life as a "complete state of physical, mental, and social well-being and not merely an absence of disease in infirmity".[4] The importance of psychological, social and physical functioning to perceived HRQOL is stressed by this model.

Quality of life is recognized as a multifactorial variable and can be subdivided into different domains like symptomatic well-being, emotional, physical, work-social, cognitive and life satisfaction, which are usually explored by means of specific questionnaires or scales.

HRQOL studies among hypertensive individuals have given some demo-flicting results. Some studies have found worse HRQOL among hypertensives when compared to the general population,[5,6] and others have found no impact of hypertension on HRQOL in some or all domains.[7] These disparate findings may be explained by the fact that these studies were independently done on different population with different study settings. The question whether some classes of antihypertensive agents are more beneficial or harmful than others in terms of QOL effects remains largely unanswered. This study was undertaken primarily to evaluate and compare the effects of currently used first line antihypertensive drugs on quality of life in patients with essential hypertension.

MATERIAL AND METHODS

This prospective, longitudinal, observational study was done in newly diagnosed hypertensive patients in a tertiary care hospital. The patients with the recent onset of hypertension attending the outpatient department of medicine were included in the study. The study was undertaken after getting approval from the institutional ethics committee. The patients were included in the study after obtaining their written informed consent. Quality of life was assessed using WHOQOL-BREF which is a standard structured questionnaire. The sample size was calculated as 110 based on confidence interval of 95%, σ as 8.7, d as 1.73 and 15% of dropout rate.

Both men and women with the diagnosis of hypertension were included in the study. Patients aged 18 years and above with a diagnosis of hypertension, who were previously not on any antihypertensive medications and willing to participate in the study were included. Patients with pheochromocytoma, cushings syndrome, primary aldosteronism, renovascular hypertension, chronic kidney disease, coarctation of aorta, chronic steroid therapy, pregnant and patients who were on treatment for other chronic diseases like diabetes mellitus, bronchial asthma, thyroid disorders and patients presenting with acute conditions like acute bronchial asthma and acute infections were excluded from the study.

At baseline visit detailed history was taken to get information on demographics, medical history and concomitant medication history. Blood

pressure was measured with patients in the seated position after 5 min rest. Blood pressure was taken as the average of two readings obtained 2 min apart. Clinical evaluations were done and All these details were captured in a predesigned pro forma. Quality of life assessment at baseline visit was done by administering the WHOQOL-BREF structured questionnaire. All patients were followed up for a minimum period of 6 months and the quality of life was again assessed at the end of follow-up period using the same questionnaire. Blood pressure measurement and clinical evaluation were also done at the end of follow-up period. The patients answered the questions without knowing their blood pressure responses to treatment and without input from family members or the professional staff.

WHOQOL BREF Questionairre

The WHOQOL-BREF questionnaire[8] is a 26 item self administered generic questionnaire. This was developed by the WHOQOL Group with fifteen international field centres and hence, it is applicable cross-culturally. The WHOQOL-BREF questionnaire is available in 19 different languages including Kannada, the local language in Karnataka. The Kannada version of WHOQOL-BREF has been validated and has demonstrated good content validity, discriminate validity, test-retest reliability, and internal consistency. It is possible to derive four domain scores namely: physical health, psychological, social relationships, environmental. There are aditional two items that are examined separately: question 1 asks about an individual's overall perception of quality of life and question 2 asks about an individual's overall perception of their health. The domain scores denote an individual's perception of quality of life in each particular domain. Domain scores are scaled in a positive direction (i.e. higher scores denote higher quality of life). The mean score of items within each domain is used to calculate the domain score.

Statistical analysis

Mean QOL scores of four domains from baseline to study end, were compared using Students' two sample 't' test. Corelation between the mean change in QOL scores and change in mean blood pressure was done using Karl Pearson corelation test. Influence of different age groups on mean change in QOL scores were assessed by one way analysis of variance (ANOVA). Influence of gender on mean change in QOL scores were calculated using Wilcoxon Mann Whitney U test. All tests were performed using a two tailed test at a significance level of 0.05.

RESULTS

A total of 114 patients completed the study with follow up of 6 months duration. Table 1 shows the demographic characteristics of these patients. The mean age of the study population is 54.7 ± 6.3 years. In our study, around 40.3% (46) patients were in the age group of 45-54 and 42.9% (49) patients were in the age group 55-65 years. Only 7.8% (9) were below 44 years and 8.8% (10) were above 65 years. Out of 114 patients, 57% (65) are males and 43% (49) are females. The most common monotherapy was with ACEI/ARB group with 38.6% (44) patients, followed by CCB (33.3%), beta blockers (21%) and diuretics (7%).

The mean domain I and domain II scores were increased, whereas that of domain III and domain IV scores were decreased at the end of the study. Domain I, which measures physical health had a mean increase of 0.5, but this was not statistically significant. Domain II, which measures psychological function, also showed a mean increase of 0.36, which was not significant statistically. Domain III, which measures social relationship showed a mean decline of 0.83 and domain IV, which measures environment conditions showed a mean decline of 0.57, both of which are not statistically significant. Question1, which measured overall quality of life showed a mean increase of 0.01, which was statistically significant,

whereas question 2, which measured overall satisfaction with health, reported a mean increase of 0.32, which was also statistically significant (Table 2).

The mean blood pressure of all the patients is decreased by 15.93 mmHg and this was statistically significant. The sub group analysis of reduction in blood pressure among patients taking different groups was also showed statistically significance. Maximum reduction of blood pressure was seen in patients on calcium channel blockers and the least reduction was seen in patients on beta blockers (Table 3).

All the four domains and the first two questions showed a positive correlation with mean change in blood pressure. The correlation was statistically significant for physical health and environmental domains (Table 4). The mean change in the score in different age groups did not differ significantly in all the four domains (Table 5).

There was no significant change in the mean changes in the score among four different domains. The psychological function and environmental domains score were better in males, whereas physical health and social relationship domain scores were better in females. Males reported a decrease in quality of life, whereas females reported an increase in quality of life. But, with respect to satisfaction with health, males reported a higher score when compared to females. All these observations were statistically insignificant (Table 6).

There was no statistically significant change in mean scores in all the four domains among patients on different antihypertensives (Table 7) and also among patients of different age groups. The improvement in physical domain scores were highest with calcium channel blockers whereas in diuretic group, there was decrease in the maen score for physical domain at the end of the study. In the psychological domain, mean increase in score was highest for diuretics and mean score was decreased in patients receiving beta blockers. In the social relationship domain, there was a decrease in mean score four all the four drug groups and the maximum reduction was seen with diuretics. In the environmental conditions domain, again there was a decrease in the score in all the drug groups, except diuretics. The increase in mean score for question 1 (quality of life) was highest with ACEI/ARB group and it is decreased in patients on beta blockers. Similarly, the increase in mean score for question 2 (satisfaction with health) was highest for calcium channel blockers. The increase in mean score for the question 2 was statistically significant for all the four drug groups.

DISCUSSION

The goal of anti-hypertensive medications is to reduce the blood pressure towards the normal limits. Specific considerations should be provided for quality of life issues, as hypertension usually presents an asymptomatic clinical picture. The patients have to be maintained on life long treatment with a regular follow up of these asymptomatic individuals in order to reduce mortality.[1] The role of quality of life in treating hypertensive patients is also important as the decrement in quality of life might adversely impact the cardiovascular outcomes.[9]

In our study, we followed a cohort of 114 hypertensive patients, who were previously untreated with medications, over a period of 6 months. The central question in our study was to evaluate whether the initiation of antihypertensive medications in such individuals would impact the quality of life in any way. The quality of life was assessed using WHOQOL-BREF questionnaire.

As we have included newly diagnosed hypertensives, all the patients were on monotherapy with major classes of antihypertensive drugs namely: ACEIs/ARBs, calcium channel blockers, diuretics and beta blockers. The efficacy of all these four classes of antihypertensives is well established in the literature. Similarly, in our study also, these drugs have reduced the blood pressure significantly. There was no significant difference among

Table 1: Demographic characteristics at baseline

Character	Male	Female	Total
n (%)	65(57)	49(43)	114(100)
Age	54.6 ± 6.6	54.84 ± 6.1	54.7 ± 6.3
BMI	24.66 ± 2.95	24.05 ± 2.51	24.40 ± 2.77
Marital Status: Married	61(93.8)	48(98)	109(95.6)
Systolic pressure	152.03 ± 7.4	151.27 ± 7.03	151.07 ± 7.22
Diastolic pressure	96.34 ± 6.5	96.20 ± 5.1	96.28 ± 5.9
Mean pressure	114.9 ± 5.3	114.5 ± 4.6	114.75 ± 5.03

Values are expressed as mean ± SD/n(%).

Table 2: Domain scores at baseline and at the end of the study

Domains	Baseline	End of the study	Mean change
Physiological	64.12 ± 11.31	64.62 ± 10.27	0.5 ± 7.70
Psychological	60.95 ± 10.25	61.36 ± 7.98	0.36 ± 5.19
Personal relationship	72.40 ± 9.07	71.57 ± 7.7	-0.83 ± 8.23
Environmental	66.04 ± 6.67	65.46 ± 7.88	-0.57 ± 7.06
Question 1	3.31 ± 0.74	3.32 ± 0.75	0.01 ± 0.52
Question 2	3.11 ± 0.82	3.43 ± 0.56	0.32 ± 0.79*

Student 't' test *$P<0.05$ Values are expressed as mean ± SD.

Table 3: Mean blood pressures at baseline and at the end of the study

Drug group	MBP at baseline (mmHg)	MBP at the end of the study (mmHg)	Mean change in MBP (mmHg)
ACEI/ARB	113.33+/-3.88	97.8+/-3.86	15.43+/-5.79*
Blockers	111.88+/-4.28	99.19+/-3.74	12.64+/-4.27*
CCB	118.10+/-5.10	99.75+/-3.34	18.35+/-4.36*
Diuretics	115.25+/-3.89	98.3+/-3.98	16.91+/-5.48*
Total	114.75+/-5.03	98.81+/-3.72	15.93+/-5.38*

Student 't' test *$P<0.01$ Values are expressed as mean ± SD.

Table 4: Correlation between mean change in blood pressure and mean change in domain scores

	PHY	PSY	SOCI	ENVIV	Q1	Q2
Pearson Correlation	0.272**	0.049	0.152	0.233*	0.034	0.132
Sig. (2-tailed)	0.003	0.604	0.107	0.013	0.722	0.162

*$P<0.05$; **$P<0.01$.

Table 5: Mean change in domain scores of different age groups

Age groups	PHY	PSYI	SOCI	ENVIV	Q1	Q2
<44	-2 ± 7.96	2.11 ± 6.21	-2.66 ± 3.16	2.7 ± 6.41	-0.11 ± 0.33	0.22 ± 0.83
45-54	0.35 ± 7.78	0.97 ± 4.56	0.15 ± 8.68	-1.44 ± 7.37	-0.06 ± 0.53	0.51 ± 0.75
55-64	0.94 ± 7.60	-0.54 ± 5.58	-0.82 ± 8.86	-1.12 ± 6.75	0.06 ± 0.51	0.16 ± 0.79
>65	1.2 ± 8.39	0.6 ± 4.74	-3.7 ± 5.25	3 ± 6.79	0.2 ± 0.63	0.4 ± 0.84
F	0.396	1.058	0.765	1.897	1.075	1.658
P value	0.756	0.37	0.516	0.134	0.363	0.18

ANOVA Values are expressed as mean ± SD.

Table 6: Correlation between mean changes in domain scores and gender

Domain Scores	Male	Female	Z	P
PHI	0.43 ± 7.55	0.59388 ±	-1.165	0.244
PSYII	1.17 ± 7.46	0.37 ± 6.97	-0.568	0.57
SOCIII	-1.11 ± 8.28	-0.47 ± 8.24	-0.319	0.75
ENVIV	-0.06 ± 7.74	-1.27 ± 6.08	-1.123	0.261
Q1	-0.03 ± 0.50	0.06 ± 0.56	-0.931	0.352
Q2	0.4 ± 0.83	0.23 ± 0.74	-1.14	0.254

Mann Whitney U Values are expressed as mean ± SD.

Table 7: Mean change in domain scores among different classes of antihypertensives

Domains	ACEI/ARB	Beta blockers	CCB	Diuretics
Physiological	0.07 ± 7.56	0.75 ± 7.86	1.13 ± 8.29	-0.88 ± 6.08
Psychological	0.72 ± 5.31	-0.54 ± 5.19	0.13 ± 5.26	2.25 ± 4.46414
Personal relationship	-0.41 ± 8.70	-1.25 ± 9.56	-0.76 ± 7.72	-2.25 ± 3.12
Environmental	-0.61 ± 7.24	-1.67 ± 7.08	-0.61 ± 6.97	3 ± 6.70
Question 1	0 ± 0.48	-0.04 ± 0.46	0.05 ± 0.56	0 ± 0.76
Question 2	0.32 ± 0.86	0.33 ± 0.82	0.34 ± 0.75	0.25 ± 0.71

Between group comparisons done by Mann Whitney U Test Values are expressed as mean ± SD.

these different classes of antihypertensives with regard to their efficacy in reducing blood pressure, though the highest reduction in blood pressure was seen with calcium channel blockers.

We did not find significant changes in any of the domains from baseline to study end. These findings are similar to previous studies done on antihypertensive medications.[10] Though patients reported increased overall quality of life, it was not significant statistically. But there was statistically significant improvement with regard to satisfaction of health over the period of the study. The increased satisfaction of health noted here could be attributed to placebo effect of medication as patients are aware that they are on treatment. This significant observation also could be the fact patients would have had lower baseline scores due to the initial labeling effect (hypertensives) causing anxiety in them. Such an adverse impact of labeling patients as hypertensives on quality of life has been reported in literature.[11]

The mean change in blood pressure had a positive correlation with quality of life in all the domains and the first two questions. The correlation was statistically significant with respect to physical domain and environmental domain. These findings are reported in several studies.[12,13] The quality of life did not significantly vary among various age groups and between gender in this study. This is in contrast to the earlier reports of deterioration of quality of life with increase in age in hypertensive patients over a long period of time. The shorter followup period of this study may not be sufficient to determine this effect.[14]

We did not find significant differences among different groups of antihypertensives with regard to their impact on QOL. But the satisfaction with health was noted in all the groups. Some studies reported advantage

with ACE inhibitors and ARBs[10,11] and others favored calcium channel blockers.[15] But in our study, when different classes of drugs were compared with each other for improvement in quality of life, there was no significant difference between them. As for as the quality of life concerned (Q1), score was highest for ACEI/ARB and score for satisfaction with health was highest for CCBs. The score for physical domain was also highest for CCBs. The quality of life decreased in patients on beta blockers. Considering the changes in mean scores in all the four domains as well as the first two questions, beta blockers seems to be the less appropriate choice as antihypertensive in a newly diagnosed hypertensive patients.

CONCLUSION

The quality of life in hypertensive patients who were previously untreated significantly correlated with hypertension control. The satisfaction with health was also significantly higher and correlated with hypertension control. There was no difference among different classes of drugs or different age group as for as the effect on quality of life is concerned.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

ABBREVIATIONS USED

QOL: Quality of life; **HRQOL:** Health related quality of life; **ACEIs:** Angiotensin converting enzyme inhibitors; **ARBs:** Angiotensin receptor blockers; **CCB:** Calcium channel blockers.

ABOUT AUTHORS

Dr. Nishith Revappala Sekhar: Is currently the co-founder of Scoop Med. He has earlier worked as Medical director in DailyRounds. He completed his MD Pharmacology from KMC Mangaluru. His expertise includes working on various medical apps, including Daily Rounds that is one of the largest case-sharing platforms for doctors in India.

Dr. Mukta Chowta: Is currently working as the Professor and Head, Department of Pharmacology, Kasturba Medical College, Mangaluru, Manipal university. Her area of research interest includes cardiovascular pharmacology, geriatric pharmacology, pharmacovigilance and preclinical research on substance dependence. She has guided many postgraduates and PhD scholars. She was the member/chairperson of ethics committees in Mangaluru as well as the member of the pharmacovigilance committee of KMC Mangaluru. She has more than 70 research publications and also co-authored a book in undergraduate pharmacology.

Dr. Kallige Nithyananda Chowta: Is currently working as Additional Professor in the Department of General medicine, Kasturba Medical college, Mangaluru, Manipal university and consultant physician at KMC hospitals, Mangaluru. He is a postgraduate teacher and guide at KMC, Mangaluru and was involved in several clinical trials. He has more than 50 research publications. His area of interest includes hypertension, metabolic disorders and infectious diseases.

Dr. Sahana Devadas Acharya: Is currently working as Associate professor in the Department of Pharmacology, Kasturba Medical College, Mangaluru, Manipal university. Her research areas of interest are infectious disease and diabetes mellitus. She has conducted many clinical and preclinical studies in the areas like diabetes mellitus, analgesics, anti-inflammatory drugs and medical ethics.

Dr. Ashok Shenoy Kudgi: Is a Professor at the Department of Pharmacology, Kasturba Medical College, Mangaluru. His research interest is in the area of clinical pharmacology and bioethics. He is the PG teacher and guide at KMC and chairperson/member of four ethics committees in Mangaluru. He has co-authored two books in undergraduate pharmacology.

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