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Original research article

CLINICAL OUTCOMES OF MONO-THERAPY VERSUS DUAL ANTIHYPERTENSIVE THERAPY IN PATIENTS PRESENTING AT TEHSIL HOSPITAL IN PAKISTAN

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Abstract: *Hypertension, a prevalent and potentially life-threatening condition, remains a significant public health concern in Pakistan. This article aims to investigate and compare the clinical outcomes of antihypertensive monotherapy versus combination therapy in patients treated at Tehsil Hospital, a critical healthcare facility in the Tehsil region of Pakistan.* ***Objective:*** *To assess and compare the clinical outcomes of hypertensive patients treated with monotherapy and those receiving a combination of antihypertensive medications at Tehsil Hospital, Pakistan.* ***Methods:*** *The study was carried out at Tehsil Hospital, Punjab-Pakistan. All adult participants (30 ≥ and ≤70 years) who were on antihypertensive medicine for at least 6 weeks and were diagnosed as hypertensive (average blood pressure of >140/90 mm Hg on at least two clinic visits) were included in the study from April 11 to June 20, 2022. The data was analyzed by SPSS 20. Statistical tests like chi-square were applied to obtain the required results.* ***Results:*** *A total of 136 study subjects were enrolled. Out of these, 113(81%) were male subjects, 23(17%) were female, 12(17.6%) smokers, and patients suffering from chronic liver disease were as 26(38.2%) treated with mono-therapy as compared with dual therapy with significant p-value 0.00 and 0.001. Other co-morbidities like the previous history of IHD, DM, and chronic kidney disease were treated with both therapies with insignificant p-values as > 0.05. Clinical outcomes were observed, and it was shown that more patients with stroke were treated with mono-therapy as p-value > 0.05 while comparing with major bleeding and control of hypertension showed a significant p-value of <0.05.* ***Conclusion:*** *Treatments in combination are effective and advised. The most important element in the management of hypertension, irrespective of whether medication is utilized, the goal is to get blood pressure down to the desired amount. Effective communication is essential for doctors, other healthcare professionals, and patients to treat patients.*

Keywords: Hypertension, Ischemic heart disease, diabetes

Introduction

Due to its high incidence, close connection to cardiovascular diseases (CVD), and intricate biology and pathogenesis, hypertension is a persistent public health concern. Globally, there are over 1.13 billion hypertensive individuals, the majority of whom are ignorant of their condition. Chronic hypertension (HTN) is a condition that is becoming more and more of a public health issue in Pakistan and other nations. A key component of preventing the morbidity and death linked to uncontrolled hypertension is effective HTN control. Nonetheless, the success of managing and controlling hypertension is correlated with the patient's views about their condition, course of treatment, and level of control. Similarly, medical professionals' knowledge of hypertension (HTN) and its care is crucial and might influence their practice. There is a dearth of qualitative studies on the knowledge of HTN, its treatment, and its impact on HTN care among physicians and patients in Pakistan. (1)

Every year, the National Institutes of Health and other government organizations collaborate with the American Heart Association (AHA) to compile the most recent data on heart disease, stroke, and cardiovascular risk factors. (2) However, in nations like Pakistan, China, and India, the rate of hypertension control is just about 6%. In Pakistan, one in three adults over the age of 40 has hypertension. The issue is quite large for a rising nation like Pakistan; this makes the issue extremely important. Numerous known contributing factors are responsible for the rising incidence of uncontrolled hypertension. (3) Key health factors that support cardiovascular health (CVH) include blood pressure (BP), glucose management, cholesterol, physical activity (PA), food, and weight. For the general public, legislators, journalists, physicians, administrators of healthcare facilities, researchers, health advocates, and anybody else looking for the finest statistics on these variables and conditions, the Statistical Update is an invaluable resource. Globally and in the US, cardiovascular disease (CVD) has a significant negative impact on both health and the economy. Several significant clinical heart and circulatory disease conditions, such as stroke, congenital heart disease, rhythm disorders, subclinical atherosclerosis, coronary heart disease, heart failure (HF), valvular heart disease, venous disease, and peripheral artery disease, are also covered in the Statistical Update along with the most recent data on related outcomes, procedures, and financial costs. (2)

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One in three people in the US has hypertension, and 2 million new instances are diagnosed with the condition each year. Twenty-eight percent of Americans also have pre-hypertension, and seven percent do not know they have hypertension. (4) More than 1 billion people globally have high blood pressure; by 2025, that figure is predicted to increase to 1.56 billion. It ranks second globally in terms of years of life lost to disability and is the main cause of mortality (5). Randomized controlled clinical trials show a reduced risk of stroke, mortality, end-stage renal disease, coronary artery disease, congestive heart failure, and peripheral vascular disease. (6) Blood pressure (BP) levels as low as 115/75 mm Hg do not necessarily eliminate the possibility of these issues developing. In the world, hypertension is regarded as the primary cause and a crucial factor in the emergence of cardiovascular illnesses. However, many patients in real clinical practice still have uncontrolled hypertension despite the availability of powerful antihypertensive drugs and copious scientific data to support them. Research suggests that control rates differ across different nations and geographical areas. (7) While hypertension awareness is increasing, from 62% in Australia to 72% in the US, the control rates are quite dismal, at 24% and 35%, respectively. The fact that China had 8% control rates and India had 6% in terms of treating hypertension raises greater concerns about the state of affairs in South Asia. Globally, about 1 billion people are estimated to have hypertension (>140/90 mmHg), and by 2025, that number is expected to increase to 1.56 billion. (8) Standard treatment protocol for hypertension management is available, but the control rate for hypertension remains unsatisfactory worldwide. Controlled hypertension is only seen in 43.5% of patients in the United States, while in just one-fourth in Japan and even a mere 13.8% in China. Foreseeing an exacerbating aging population, where the number of older adults would increase by 66% in Asia over the next 15 years, alternative strategies are urgently required to reduce the healthcare burden posed by hypertension. (7) Diuretics are advised to be used as the recommended first antihypertensive medication, either alone or in combination, according to the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure's Seventh Report (JNC7). However, promising results from clinical trials indicate that other antihypertensives, such as angiotensin-converting enzyme inhibitors (ACEIs), reduce the side effects of high blood pressure. (8) According to the guidelines, most hypertensive patients need to take at least one antihypertensive medication to achieve normal blood pressure, which will significantly lower their risks. (9) As a result, doctors' prescriptions for antihypertensive drugs vary greatly globally. The most often prescribed groups of antihypertensive medications worldwide are four: diuretics, ACE/ARB inhibitors, beta-blockers, calcium channel blockers, and angiotensin-converting enzyme inhibitors (CCBs, b-blockers) (10)

Methodology

The study was carried out at Tehsil Hospital, Punjab-Pakistan. All adult participants (30 ≥ and ≤70 years) who were on antihypertensive medicine for at least 6 weeks and were diagnosed as hypertensive (average blood pressure of >140/90 mm Hg on at least two clinic visits) were included in the study from April 11 to June 20, 2022. Subspecialists in medicine, internists, and general practitioners all provided antihypertensive medications. Patients who failed to provide a record of their antihypertensive medication were not included in the research.

The primary predictor of outcome was the use of various antihypertensive treatments. Drug therapy was divided into two categories: monotherapy and dual therapy. The secondary outcome was the use of diuretics as an antihypertensive drug. Training staff entered data on co-occurring conditions, the kind of antihypertensive medication, and demographics.

The analysis was conducted using SPSS 21.0, statistical software for social sciences. The mean and standard deviation were employed for quantitative variables, while frequency and percentage were used for qualitative variables. The independent sample t-test and analysis of variance were used to compare the quantitative and qualitative variables using the chi-square test. A significance level of $p < 0.05$ was considered.

Results

A total of 136 study subjects were enrolled. Out of these, 113(81%) were male subjects and 23(17%) were female. The mean age (±SD) of the different research groups was 53.79 ± 8.80 years in group A (Mono-therapy) compared with group B (Dual Therapy) was 53.74 ± 925 with insignificant p-value 0.311 and for males and females, it was 48(70.6%) and 20(29.4%) in Group A while in other group B, it was 65(95.6%) and 3(4.4%) respectively. Most of the study subjects were Illiterate 22(32.4%) in both groups, with insignificant p-values observed in the area, 0.500. However, there was a difference found in the annual income of participants, as the p-value was 0.05. (Table 1).

•Results showed that 12(17.6%) smokers and patients suffering chronic liver disease were as 26(38.2%) treated with mono-therapy as compared with dual therapy with significant p-values 0.00 and 0.001. Other co-morbidities like the previous history of IHD, DM, and chronic kidney disease were treated with both therapies with insignificant p-values as > 0.05. (Table 2)

•Clinical outcomes were observed; it was shown that more patients with stroke were treated with mono-therapy as p-value > 0.05 while comparing with major bleeding and control of hypertension showed a significant p-value as <0.05. (Table 3)

Table#1: Demographics of study participants of Different Research Groups.

Demographic Variables		Research Group		p-value
		Group: A (Mono-Therapy)	Group B (Dual Therapy	
Age (Mean ± SD) (Age range 30-70)		53.79 ± 8.80	53.74 ± 925	0.311
Gender	Male	48(70.6%)	65(95.6%)	

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	Female	20(29.4%)	3(4.4%)	0.00
Grouped Age				
30-50		30(44.1%)	23(38.8%)	0.291
51-70		38(55.9%)	45(66.2%)	
Education				
Illiterate		22(32.4%)	22(32.4%)	0.991
Primary		7(10.3%)	7(10.3%)	
Matric		10(14.7%)	9(13.2%)	
Graduation		20(29.4%)	19(27.9%)	
Master Degree		9(13.2%)	11(16.2%)	
Area				
Rural		20(29.4%)	21(30.9%)	0.500
Urban		48(70.6%)	47(69.1%)	
Annual Income				
≤50,000/-		26(38.2%)	21(30.9%)	0.05
Rs. 50, 000- 1,00, 000/-		30(44.1%)	23(33.8%)	
≥ 1,00,000/-		12(17.7%)	24(35.3%)	

Table#2: Comparison of Different Therapies concerning Risk factors

Risk Factors	**Research Group**		**p-value**
	Group: A (Mono-Therapy)	**Group B (Dual Therapy**	
Smoking			
Yes	12(17.6%)	35(51.5)	0.00
No	56(82.4%)	33(48.5%)	
Previous History of IHD			
Yes	13(19.1%)	10(14.7%)	0.324
No	55(80.9%)	58(85.3%)	
Family History of DM			
Yes	28(41.2%)	33(48.5%)	0.245
No	40(58.8%)	35(51.5%)	
Chronic Liver Disease			
Yes	26(38.2%)	9(13.2%)	0.01
No	42(61.8%)	59(86.8%)	
Chronic Kidney Disease			
Yes	17(25.0%)	23(33.8%)	0.173
No	51(75.0%)	45(66.2%)	

Table 3 Comparison of Clinical Outcomes of Therapies

Clinical Outcomes	**Type of Therapy**		**p-value**
	Group: A (Mono-Therapy)	**Group B (Dual Therapy**	
Stroke			
Yes	6(8.8%)	3(4.4%)	0.246
No	62(91.2%)	65(95.6)%	
Major Bleeding			
Yes	14(20.6%)	2(2.9%)	0.001
No	54(79.4%)	66(97.1%)	
Hypertension Treatment			
Uncontrolled	32(47.1%)	21(30.9%)	0.039
Controlled	36(52.9%)	47(69.1%)	

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Discussion

The findings of this study will contribute valuable insights into the effectiveness of monotherapy versus combination therapy in managing hypertension at Tehsil Hospital. The discussion will focus on the implications of the results for clinical practice, potential barriers to optimal treatment, and recommendations for enhancing hypertensive care in the Tehsil region.

Hypertension is a significant public health issue in both economically developed and underdeveloped nations. In this thorough systemic review, we reported estimates of the prevalence of hypertension in the adult Pakistani population. There is currently insufficient national data on the prevalence of hypertension. The current study was a comparative study conducted at Tehsil Hospital, Punjab-Pakistan The target and study populations essentially had similar characteristics. In the current study, a total of 136 research patients were enrolled. Out of these, 113(81%) were male subjects, and 23(17%) were female. The mean age (±SD) of the different research groups was 53.79 ± 8.80 years in group A (Mono-therapy) compared with group B (Dual Therapy) was 53.74 ± 925 with insignificant p-value 0.311 and for males and females, it was 48(70.6%) and 20(29.4%) in Group A while in other group B, it was 65(95.6%) and 3(4.4%) respectively.

In the research study conducted by Riaz et al. (2021), 50 participants were enrolled, 25 of whom were female and 25 were male. The participants' average age was 32.15 ± 2.63 years. Males averaged 26.0 ± 3.2 years, whereas females averaged 35 ± 5.0 years. There were 22 (44%) married participants in this study, 15 (30%) hypertensive people, 11 (22%) smokers, and 28 (56%) participants with a family history of hypertension. (7)

The majority of the current study's participants were Illiterate: 22(32.4%) in both groups. Insignificant p-values were observed in area 0.500, but a difference was found in the participants' annual income, as the p-value was 0.05.

Research findings shared by Lewington et al. (2016), investigate the incidence, diagnosis, management, and therapy of hypertension in addition to estimating the death rate from CVD in China related to hypertension. The cohort included 205 167 men (41.0%) and 295 056 women (59.0%) with a mean (SD) age of 52 (10) years for both sexes. They found that the education level of enrolled subjects was at middle or high school among men as 102 428 (49.9%) compared with female as 114 613 (38.8%). (3)

Results of the current study showed that 12(17.6%) smokers and patients suffering from chronic liver disease were as 26(38.2%) treated with mono-therapy as compared with dual therapy with significant p-values 0.00 and 0.001. Other co-morbidities like the previous history of IHD, DM, and chronic kidney disease were treated with both therapies with insignificant p-values as > 0.05

Yousuf et al., 2021 conducted research; the purpose of their study was to determine the frequency of antihypertensive medication compliance in our community and determine whether adherence and the onset of a hypertensive crisis are related. Two hundred sixty people who matched the inclusion criteria were enrolled; 167 (64%) took their prescriptions as prescribed, whereas 93 (36%) did not. 51.5% of the studied population was female, and 48.5% was male. Most patients (37.2%) were between the ages of 61 and 75; 80.2% did not smoke, and 63.4% had completed secondary or university education. Diabetes mellitus was found to be the most frequent co-morbid condition, accounting for 54.8% of cases, after hypertension. (11)

Clinical outcomes were observed; it was shown that more patients with stroke were treated with mono-therapy as p-value > 0.05 while comparing with major bleeding and control of hypertension showed a significant p-value as <0.05.

The results of a research study conducted by Lewington et al. (2016)found that Diuretics were being used as an antihypertensive medication by 31% of the patients. Patients with the following comorbidities—diuretic use (33% vs. 66%; p 0.02), CKD (43% vs. 66%; p 0.003), and IHD (37% vs. 63%; p 0.001). Research findings shared by Lewington et al. (2016) investigate the incidence, diagnosis, management, and therapy of hypertension in addition to estimating the death rate from CVD in China related to hypertension. Of those with hypertension, 30.5% had received a diagnosis from a physician; of those with a diagnosis of hypertension, 46.4% were being treated; and of those treated, 29.6% had their hypertension controlled (i.e., systolic BP).

Conclusion

Treatments in combination are effective and advised. The most important element in the management of hypertension, irrespective of whether medication is utilized, the goal is to get blood pressure down to the desired amount. Effective communication is essential for doctors, other healthcare professionals, and patients to treat patients.

Declarations

Data Availability statement
All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate.
It is approved by the department concerned. (IRBEC-328-TQ-22)

Consent for publication
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Conflict of interest

The authors declared an absence of conflict of interest.

Authors Contribution

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Concept & Design of Study

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