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Uncontrolled Hypertension and its Contributing Factors in a Tertiary Care Hospital of Lahore, Pakistan.

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Abstract:

Hypertension is a major cause of morbidity and mortality worldwide. In spite of the availability of adequate medical therapy, more than half of the patients have blood pressures persistently above the treatment threshold (140/90 mmHg).

Objective:To investigate the factors responsible for uncontrolled hypertension.

Materials and Methods: It was a descriptive cross-sectional study. The study population comprised of 152 consecutive hypertensive patients more than 18 years of age presenting to the Nephrology Clinic at Fatima Memorial Hospital during the period of one month (July 2020) were included in this study. The criteria for control was defined as an office BP of less than 140/90 mmHg.

Results: 96 patients (63.2%) had controlled blood pressure and 56 patients (36.8%) had uncontrolled blood pressure. Males exhibited uncontrolled BP (59%) more than females. Out of all the factors studied, volume status had a significant effect on control of HTN (p=0.003).

Conclusion

Control of hypertension in our population is still far being perfect. There is a need to fortify our efforts to control hypertension so as to reduce associated morbidity and mortality. At the same time there is a need to conduct large studies to fully elucidate the factors contributing to uncontrolled hypertension in our population.

Key words: Hypertension, compliance, treatment, target.

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Introduction:

It is estimated that 31.1% of adults (1.39 billion) worldwide had hypertension in 2010.[1] Hypertension is the leading cause of cardiovascular disease and premature death worldwide.[2] It stands out as being a common cause of damage to brain, kidneys and eyes as well. It is also suggested that the epidemic of hypertension is more likely to show accelerated growth in low- and middle-income countries.[1] which suggests that the healthcare system in Pakistan may expect increasing burden of hypertension and hypertension related end organ damage in the years to come. This is relevant because worldwide estimates for financial costs of treating hypertension and hypertension related complications are staggering, to say the least (10% of the world's overall health-care expenditure).[3] However, the fact that reduction and control of blood pressure to guidelines-based targets mitigates the cardiovascular morbidity and mortality may be a silver lining.[4]

The silver lining remains the fact that controlled hypertension is shown to improve cardiovascular morbidity and mortality.[4-7] It is important that factors governing uncontrolled hypertension be elucidated in our local population to help formulate health policies regarding uncontrolled hypertension and its management. This study looked at the factors that may be involved in the uncontrolled blood pressure among patient presenting to our outpatient department.

Materials and Methods:

This was a descriptive, cross-sectional study. The study population comprised of 152 hypertensive patients more than 18 years of age presenting to the Nephrology Clinic at Fatima Memorial Hospital.

The criteria for control were defined as rested, sitting office BP of less than 140/90 mmHg. BP was taken from the right arm since the study population included dialysis patients who conventionally have fistulas on left arm. Our clinics routinely employ mercury sphygmomanometers with choice of arm-circumference appropriate BP cuffs. BP readings were taken twice, and lower values were documented.

The demographic factors (age, gender, weight, height) and other study variables (comorbidities including diabetes, coronary artery disease, chronic kidney disease and stage, volume status assessment, compliance (how many times did the patient omit medications during the past one month?), medications along with BP were noted in a specially designed data collection form. The volume status was categorized as hypervolemic, euvolemic and hypovolemic based on simple physical examination.

The patients were triaged according to presence or absence of comorbidities, the classes of medications being used and compliance whereas patients with CKD were further grouped according to HD and non-HD patients. Frequencies were calculated and tests of significance (Chi square) were applied to check significant effect for these variables on BP control. Means were calculated for quantitative variables e.g., age, weight and body mass index (BMI). Independent samples T tests were carried out to check for the effect of these variables for significant effect on BP control. Log transformation for normalization of data followed by Pearson correlation coefficients were calculated for compliance, gender, DM, CKD, volume status and control of hypertension.

Results:

Population characteristics are given in Table 1. 96 patients (63.2%) had controlled blood pressure and 56 patients (36.8%) had uncontrolled blood pressure. Males exhibited uncontrolled BP (59%) more than females (41%). 133 patients (87.5%) were compliant out of whom 83 patients (62.4%) had controlled hypertension. No correlation between control and gender, compliance or type of drug being used was found.

Further analysis did not reveal correlation of gender (r: 0.54 p=0.065), DM (r: 0.42, p=0.517), kidney disease (r: 0.62, p=0.482) on control of HTN. Volume status, however, had a significant effect on control of HTN (r: 0.67, p=0.003).

Table 1: Demographics of the cohort.

Mean Age (years)		52 (±12.81)
Gender	**Males**	72
	Females	80
Mean weight (Kg)		71.2 (±12.6)
Mean height (feet)		5.1 (±0.52)
Mean BMI (kg/m²)		28.2 (±5.67)
Diabetes		35 (62.5%)
Coronary Artery Disease		17 (30.3%)
Chronic Kidney Disease		27 (48.2%)

Discussion:

Hypertension remains a cause of considerable mortality and morbidity around the world.[8] With emerging data that low- and middle-income countries may bear the major brunt of complications arising out of poorly controlled hypertension, we felt that it is high time to look closely into the prevalence of uncontrolled hypertension in our population.

Our cohort showed a high rate of compliance. WHO finds compliance or adherence to antihypertensive treatment varying from 50-70% across the globe. We found it to be around 87.5% in our study, which is again attributed to the close follow up being offered at our center, however no correlation of controlled hypertension was found with regards to compliance (Pearson' s r: 0.47, p: 0.67).[9] This seems to be counter-intuitive however it is to be

acknowledged that "compliance" may mean different to patients than to physicians. A common observation is that patients take on and off medications when they "feel" that their blood pressure is high. According to their own ideals, this constitutes "compliance" for them and a simple questionnaire-based study may not be able to bring out the difference between true and actual compliance. Pill counts, a gold standard way to study compliance was not a part of this study and the therapeutic effects of complex anti-hypertensive regimens may differ according to differing patients' physiology. Suffice to say, it may require a larger study to settle this seeming discrepancy.

Our study reveals that around two-thirds (63.2%) of the patients had controlled hypertension. This is better than a few loco-regional and international studies.[10-17] Although this is an encouraging finding, the interpretation should be cautious. Our cohort consisted of middle-aged patients, with high mean BMI and more representation of females as compared to males. Studies have revealed increasing ages and male gender as a risk factor for uncontrolled hypertension making it a possibility that a higher sample size may have been more revealing.[18] Our study confirms that high BMI may be a risk factor for uncontrolled hypertension as suggested by a number of authors.[18] It is also to be noted that ours is a private healthcare center and all efforts are made to keep a close follow up of the patients. We feel that a close follow up may have played a central role in motivating the patients to monitor, hence control, their blood pressures. This is highlighted well in a recent study from Pakistan where follow up at a government health care facility was found to be associated with uncontrolled hypertension.[11] Although a higher percentage of male participants were found to have uncontrolled hypertension, the gender difference failed to reach significance.

Our study finds that hypervolemia was significantly associated with uncontrolled hypertension.[19,20] This seems to be self-explanatory. An expansion in extracellular volume is often a contributing factor of difficult to control hypertension. The determinants of volume overload in patients with uncontrolled hypertension seem to be high sodium intake and presence of chronic kidney disease.[20] Our cohort belongs to an area which is known for high sodium content foods. This seems to be the underlying cause of uncontrolled and resistant hypertension even in patients taking adequate diuretics. A special mention needs to be made of the over the counter NSAIDs and herbal derivatives which are regularly taken by our population and may interfere with the anti-hypertensive medications and/or lead to worsening of volume status. These OTC medications may only be revealed on careful, repeat questioning and sometimes "looking in the medicine drawer".

The limitation of our study was an apparent small sample size which prevented us from concluding a few aspects with certainty. However, this study acts as a springboard for larger studies on this same subject in our region.

Conclusion

Control of hypertension in our population is still far being perfect. There is a need to fortify our efforts to control hypertension so as to reduce associated morbidity and mortality. At the same time there is a need to conduct large studies to fully elucidate the factors contributing to uncontrolled hypertension in our population.

Conflict of Interest: None

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