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# STUDY TO ASSESS RESISTANT HYPERTENSION, IT'S PREVALENCE AND COMPLICATIONS IN PATIENTS REPORTING TO TERTIARY CARE CENTER

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## ABSTRACT

**Objective**: To study the incidence, prevalence, and complications of resistant hypertension among people of varying age groups in public hospital of Pakistan. **Materials and method**: A cross sectional study was conducted at the department of medicine in Jinnah Hospital Lahore from February 2019 to July 2019. A total of 120 patients were studied. The number of female patients were 43 and the number of male patients were 77. The patients were diagnosed as resistant hypertensive if they showed blood pressure measurements of 140/90 mm Hg or more than that in office setting and out office settings, and showed suboptimal response to three antihypertensive drugs, one of which was, by preference, a diuretic. White coat effect and inadequate adherence to regimen, which could produce profound pseudo resistance, were eliminated before diagnosing the patients with resistant hypertension. **Result**: A total of 120 patients were studied and their ages varied up to 20 – 80 years with a mean age of 52.37 years ±6.92 years. The number of female patients were 43 (35.8%) and number of male patients were 77 (64.1%). The BMI of patients happened to be in a range of 19 – 32 Kg/m², with a mean BMI 26.59 Kg/m² (±3.28) Patients were further divided into two subgroups of age (20 – 50 years and 50 – 80 years). The findings of study showed a higher incidence of resistant hypertension among female patients (48.8%) and age group of 50 – 80 years was found to be more at risk (28.7%). **Conclusion**: The study showed higher prevalence of resistant hypertension among females in comparison to male hypertensive patients. The age group of 50 – 80 years was found to be more affected.

**KEYWORDS:** Resistant hypertension, Obesity, White coat effect, Pseudo resistance.

## INTRODUCTION

Hypertension has presented itself globally as a major health risk for developing world with persistent increase in its prevalence. Hypertensive discrepancies are substantial and increasing globally (Mills, K.T et al. 2016). With life-style being one of the predisposing factor for hypertension, an appreciable variation has been identified between the urban and rural populations worldwide. Gupta, R et al. in their study of trends and prevalence of hypertension in India, that spanned for over 25 years, concluded that hypertension prevalence escalated in urban population. Similar trends of prevalence have been seen in population of Pakistan with incidence of hypertension varying up to 17.9% in urban population in comparison to rural population. Hypertension being cause of suboptimal quality of life, it is contemporary to many cardiovascular diseases (CVD) and other non-transmissible chronic conditions that may elevate the morbidity and mortality rates. A deep rooted and continual relationship is found to exist between hypertension and incidence of CVD and cerebrovascular disease (Lindholm L,H 2002). Occurrence of chronic kidney disease (CKD) of stage 3-5 in uncontrolled hypertensive patients is up to 37.5% (Krittayaphong, R et al. 2017). Mancusi, C et al. in their study regarding obesity and prevalence of hypertension concluded higher blood pressure among obese population despite using combination therapy. The event of hyperlipidemia was found to be 33.3% of the total hypertensive patients (Ademolu, A 2017). Another study by Yildiz, M et al. deduce a positive relationship between left ventricular hypertrophy with elevated blood pressure.

Resistant hypertension can be interpreted as elevated blood pressure in patients in spite simultaneous use of antihypertensive drugs of various classes (calcium channel blocker, angiotensin-converting enzyme inhibitor, angiotensin receptor blocker) in highest permissible dose, one of which, by preference, is a diuretic. Resistant hypertensive patients can also be determined as individuals who attain desired blood pressure with compliance to four or more than four medications (Carey, R.M et al. 2018). The cut-off value specified by American Heart Association is 130 mm Hg for systolic BP and 80 mm Hg for diastolic BP. BP should be evaluated in office as well as out office

settings owing to significant white-coat effect. Ghazi, L et al found frequency of white coat effect in patients with uncontrolled hypertension ranging up to 20% to 23%. Another element that should be considered before diagnosing patient with resistant hypertension is uncompromised compliance with regimen and decent physician-patient communication.

## MATERIALS AND METHOD

A cross sectional study was conducted in the medicine department of Jinnah Hospital Lahore from February 2019 to July 2019. A total of 120 patients were studied, both male and female, during this time, after consecutive sampling. The range of age varied between 20 – 80 years. All the patients with a BP of 140/90 mm Hg or more than that on more than two occasions, with a history of hypertension over past six months were included in the study and were admitted to ward. Exclusion criteria encompassed: patients that presented with a diagnosis or known history of resistant hypertension and those who were currently being treated for resistant hypertension. An informed consent was taken from all the patients in writing. Patients were diagnosed with resistant hypertension if the BP on clinical examination and history exceeded the goal measurement of 140/90 mm Hg after being treated with three antihypertensive drugs of different classes, one of which, ideally was a diuretic. Old prescriptions of patients were studied and direct observational therapy was conducted in order to eliminate pseudo resistance as consequence of improper regimen following. Initially, patients were made to follow the same regimen as they followed at home, BP readings were taken 12 hourly and were recorded in pre-designed performa against their demographic data. Patients who showed improvements after dose adjustments were discharged consequently. Patients who showed suboptimal response to dose adjustments and remained hypertensive were diagnosed with resistant hypertension. All the data was evaluated on SPSS version 16. Quantitative variables such as BP (systolic and diastolic), body mass index (BMI) and age were presented as mean ± standard deviation (S.D). qualitative variable such as frequency of disease and gender were presented as frequency and percentage. A chi square test was applied after stratification of data according to age and gender.

## RESULT

A total of 120 patients were studied. The age of patients ranged between 20 – 80 years with a mean age of 52.37 years ±6.92 years. The range of BMI was found to be between 19 – 32 Kg/m², with a mean BMI of 26.59 Kg/m² (±3.28). Out of total, number of female patients were 43 (35.8%), number of male patients were 77 (64.1%). Female to male ratio was found to be 1:1.8. Patients were stratified according to age, dividing patients into two subgroups of patients ranging between ages of 20 – 50 years and another group with ages ranging between 50 – 80 years. In group of 20 – 50 years, out of 54 (45%) hypertensive patients, 14 patients (25.9%) were found to be resistant hypertensive. The rest 66 patients (55%) belonging to age group 50 – 80, the incidence of resistant hypertension was found in 19 (28.7%) patients. Minor association (P=1.00) was recorded between age and resistant hypertension. The number of females found to be resistant hypertensive were 21 (48.8%) and the number of male resistant hypertensive patients were 12 (15.5%). Females were found to be more resistant hypertensive in comparison to male (P= 0.001).

**Table 1: Stratification for age.**

| Age | Hypertension resistance Yes (%) | No (%) | P value |
|---|---|---|---|
| **20-50** | 14(25.9) | 40(74%) | 1.00 |
| **50-80** | 19(28.7%) | 47(71.2%) | |
| **Total** | 33(27.5%) | 87(72.5%) | |

**Table 2: stratification for gender.**

| Gender | Resistant hypertension Yes (%) | No (%) | Total | P value |
|---|---|---|---|---|
| **Male** | 12 (15.5) | 65(84.4%) | 77 | 0.001 |
| **Female** | 21(48.8%) | 22(51.1%) | 43 | |
| **Total** | 33 (27.5%) | 87(72.5%) | 120 | |

## DISCUSSION

The incidence of hypertension is as high as one out of five individuals (Ishtiaq, M et al. 2020), affecting more than 1.2 billion people around the globe. Reduction of hypertension has dietary (lifestyle) and medicinal elements. Ndanuko R.N et al. summarized positive results of dietary changes in hypertensive patients. However, the results of medicinal efforts remained bitter-sweet. A great amount of people remained hypertensive even after administration of three or more than three antihypertensive drugs. Such difficult to treat patients are also acknowledged as resistant hypertensive patients. Dudenbostel, T et al. in their study found 12.8% of all hypertensive patients to accurately fill the criteria of resistant hypertension. Inadequate adherence, which may be due to inability to start pharmacotherapy, to follow the frequency of medications prescribed, and failure to continue long term therapy can be the causes (Burnier, M and Egan, B.M 2019). Inappropriate combinations of antihypertensive drugs were found to be about 40% in a study conducted by Petrák, O et al. Other factors that are found to contribute to resistant hypertension were voluminous alcohol consumption and

inadequate doses. Secondary hypertension has also posed as factor of drug resistance.

All categories of above mentioned pseudo resistance should be eliminated before diagnosing patients with resistant hyper tension. After sound elimination of pseudo resistance, if a patient still presents with above goal BP, they are diagnosed with resistant hypertension. With increasing obesity tendency and aging, the prevalence of resistant hypertension is increasing subsequently. The study indicated prevalence of resistant hypertension up to 27.5% (33 out of 120 individuals). The sizeable result indicates that a significant amount of hypertensive patients have to put up with resistant hypertension. A minimal relationship was found between age and resistant hypertension. A greater association was found with female gender with prevalence up to (48.8%). A further study should evaluate genetic, lifestyle and dietary factors of these patients. And all the patients with resistant hypertension should be educated on modification of lifestyle with dietary changes and maintaining BMI in healthy range. A similar study by Naseem, R et al showed increased frequency of resistant hypertension in females (80.6% of all hypertensive patients) which supports the results of this study. Another study by Ishtiaq, S et al. show a female gender predilection towards resistant hypertension by 78.1%, hence supporting the findings of my study.

## CONCLUSION

This study uncovers the prevalence of resistant hypertension in females more than males. The age group that was more frequently affected was 50 – 80 years.

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