ORIGINAL ARTICLE

DEMOGRAPHICS AND COMORBIDITIES ASSOCIATED WITH HYPERTENSION AND PRESCRIPTION PRACTICES BY JUNIOR HOUSE OFFICERS FOR DISEASE MANAGEMENT IN RELATION TO CLINICAL GUIDELINES

Saqib Khan[1], Muhammad Ahsan[2], Aysha Mushtaq[3]

[1]Lecturer & Research Officer, HBS College of Pharmacy, HBS Instituteof Healthcare & Allied Health Sciences, Islamabad. Department of DME, HBS Medical & Dental College, Islamabad. [2]Assistant Professor HBS College ofPharmacy, HBS Institute of Healthcare & Allied Health Sciences, Islamabad. [3]Assistant Professor Department of Physiology, HBS Medical & Dental College, Islamabad

ABSTRACT

Objective: To identify the demographics and most common comorbidities associated with hypertension and evaluate the prescription practices of Junior house officers for pharmacotherapy of hypertension, focusing on standard guideline adherence.

Study Design: Descriptive, Cross-Sectional Study.

Place and Duration of Study: Abbottabad, 03 months(Feburary to April 2021).

Methodology: This study was conducted on 120 hypertensive patients from the in-patient department. Demographic data, comorbidities, treatment regimens, and adherence to Joint National Committee (JNC-8) guidelines were extracted from patient charts. Descriptive statistics were used to assess associated comorbidities and adherence to guidelines.

Results: In our study population, hypertension is found slightly more common in males (52.5%) and in those aged 51-60 years (30%). Diabetes was the most prevalent comorbidity (41.7%) followed by Ischemic heart disease (40%). Vasodilators (66.67%), diuretics (42.50%), and beta blockers (40.83%) were the most frequently prescribed antihypertensive drugs, whereas statins (65.83%) and antiplatelets (56.67%) represented the predominant combination therapies. Only 47.5% of prescriptions complied with JNC-8 guidelines.

Conclusion: Hypertension was commonly reported in male and old age patients. Diabetes mellitus and ischemic heart disease were the most common comorbidities. The majority of junior house officer's prescriptions for hypertensive patients were inconsistent with the established guidelines. This highlights the necessity for targeted educational interventions and enhanced support to improve guideline adherence and treatment outcomes.

Keywords: *Comorbidity, Drug prescriptions, Guideline Adherence, Hypertension.*

How to cite this article: *Khan S, Ahsan M, Mushtaq A. Demographics and Comorbidities associated with hypertension and Prescription Practices by Junior House Officers for Disease Management in Relation to Clinical Guidelines. HMDJ. 2024 Dec; 04(02): 60-64. https://doi.org/10.69884/hmdj.4.2.9273.*

INTRODUCTION

Hypertension is a pervasive global health issue, representing a significant risk factor for severe cardiovascular events, chronic kidney disease, and stroke, particularly where blood pressure management is inadequate[1,2]. Management of hypertension is increasingly intricate in patients with old age and concurrent conditions like chronic kidney disease and diabetes. In these cases, such medications should be prescribed that can control high blood pressure as well as address other comorbidities, in accordance with the standard clinical guidelines to optimize outcomes[3]. For junior house officers (JHOs), who frequently encounter these challenging cases in inpatient settings, an extensive knowledge of standard guidelines for the management of hypertension is important for safe and effective prescribing practices [4].

Correspondence to: Dr. Saqib Khan, Lecturer & Research Officer, HBS College of Pharmacy, HBS Institute of Healthcare &Allied Health Sciences, Islamabad.

Email: dr.saqib0099422@gmail.com

Received: 29-11-2024
Revision: 10-12-2024
Accepted: 18-12-2024

doi.org/10.69884/hmdj.4.2.9273

Despite the available standard treatment guidelines, research reveals a notable gap in both knowledge and adherence to protocols for hypertension pharmacotherapy among junior house officers[5,6]. Deviations from standard protocols can compromise treatment efficacy and increase the risk of adverse drug reactions, especially in patients with other comorbidities. The selection and dose of medications, particularly with coexisting illnesses, require a precise and evidence-based approach. For instance, Angiotensin-converting enzyme (ACE) inhibitors or angiotensin II receptor blockers (ARBs) are often prescribed for patients with diabetes for renal protection[7,8]. Meanwhile, additional dose adjustments are required in patients with chronic kidney disease to safeguard kidney function and reduce the risk of potential toxicities[9]. Adherence to evidence-based guidelines and judicious treatment selection enables the JHOs to effectively navigate complexities in hypertension management, ultimately enhancing patient outcomes.

CAPSULE SUMMARY

Hypertension was more common in males and the elderly. Diabetes mellitus and ischaemic heart disease were the most prevalent comorbidities. Most prescriptions by the junior house officers did not adhere to recognised norms. This emphasises the importance of targeted educational initiatives and increased assistance to improve guideline adherence and treatment outcomes.

Recent clinical guidelines by American College of Cardiology/ the American Heart Association (ACC/AHA) and European Society of Cardiology (ESC) emphasize the shift towards patient-centered care, highlighting the necessity of considering patient comorbidities, age, and cardiovascular risk, in decision-making for treatment strategies[1,10]. The initial treatment decisions made by junior house officers(JHOs) have a profound impact on patients' long-term health outcomes, underscoring the importance of considering complex patient factors. In patients with comorbid hypertension and chronic heart failure, beta-blockers and selective ARBs are associated with improved survival and reduced hospitalization rates. Conversely, combination therapy involving thiazide diuretics and ACE inhibitors is efficacious in preventing stroke recurrence in hypertensive patients [11].

This study was planned to find out the demographics and comorbidities associated with hypertension, and to investigate the prescribing patterns of JHOs in managing hypertension among inpatients, with a particular emphasis on adherence to clinical guidelines. This will encourage the development of tailored educational interventions, aimed at enhancing clinical outcomes for hypertensive patients. Given JHOs' critical role in initiating treatment, bolstering their expertise in pharmacotherapy and guideline adherence is crucial for improving patient care quality and mitigating hypertension-related complications.

METHODOLOGY

In this Descriptive cross-sectional study, data was collected between February to April 2021 from a hospital in Abbottabad. The IRB approval was taken from the Department of Pharmacy, COMSATS University, Abbottabad (Reference number: FA16-PHM-060/ATD, Date: 18-1-2021). All patients of both genders, ages over 18 years and diagnosed with hypertension within the specified duration (Feb 2021-April 2021) were included in the study by using a convenience sampling technique. Patients having prescriptions suggested by senior doctors were excluded. Data were extracted from patient charts containing key details such as demographics, chief complaints, laboratory reports (blood pressure, respiratory rate, temperature etc), treatment regimen, and adherence to prescribed medications. The study also included patient comorbidities which influence the choice of pharmacotherapy based on current guidelines.

To guide pharmacotherapy evaluation, the study referred to resources like the British National Formulary (BNF), Eighth Joint National Committee (JNC-8) guidelines, AHA journals, Medscape, Drugs.com, and recent literature via Google Scholar.

A standardized format for collecting data was adopted to document prescription data, treatment categories, and pharmacotherapy regimens uniformly. Multiple variables were analyzed including age, gender, type of hypertension and co-morbidities. MS Office Excel version® 2021 and SPSS version 26 were used to calculate descriptive statistics for all variables.

RESULTS

A total of 120 patient records were analyzed for this study, focusing on individuals diagnosed with hypertension. Among the studied population, a slightly higher prevalence of hypertension (52.5%) was found in males compared to females (47.5) as given in Table 1.

Regarding age distribution, the most prevalent age group among hypertensive patients was 51-60 years, comprising 30% of the total cases. This was followed by the 61-70 year age group, which accounted for 23% of the patients (Table 2).

The analysis of patient complaints revealed a variety of symptoms reported by individuals diagnosed with hypertension. Among these, the most prevalent complaint was chest pain (80%). Other commonly reported complaints included shortness of breath (SOB), fever, and headache. The frequencies and percentages of these complaints are summarized in Figure 1.

The assessment of comorbidities among the study participants revealed that diabetes was the most frequently reported condition (41.7%) followed by ischemic heart disease (IHD) (40%) (Table 3).

Table 1: Gender-wise prevalence of hypertension in study participants

Gender	Frequency (n=120)	Percentage (%)
Male	63	52.5
Female	57	47.5

Table 2: Prevalence of hypertension among participants of different age groups.

Age Groups (years)	Frequency (n=120)	Percentage (%)
21-30	3	2
31-40	15	13
41-50	21	18
51-60	36	30
61-70	28	23
71-80	13	11
81-90	4	3

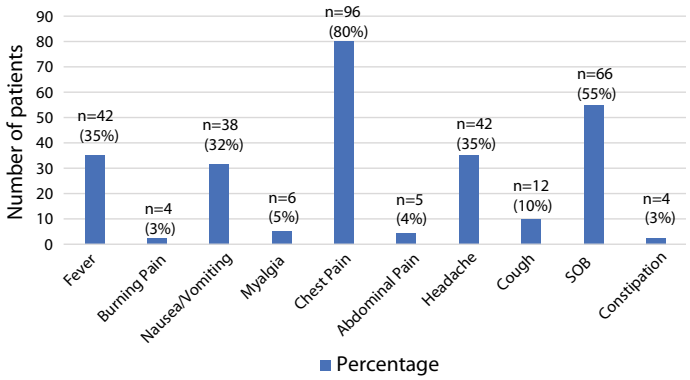

Figure 1: Chief complaints reported by the patients diagnosed with hypertension (n=120).

Table 3: Reported comorbidities in patients presented with hypertension.

Comorbidities	Frequency (n=120)	Percentage (%)
CKD	9	8
Asthma	2	2
MI	30	25
Stroke	6	5
Diabetes	50	42
Dyslipidemia	5	4
IHD	48	40
CHF	13	11

CKD: Chronic kidney disease, MI: Myocardial infarction, IHD: Ischemic heart disease, CHF: Congestive heart failure

Table 4: Antihypertensive and other classes of medication prescribed to the patients.

Medication Class	Frequency (n=120)	Percentage (%)
Antihypertensive		
ACEI	22	18.33
ARBS	21	17.50
CCB	12	10.00
Diuretics	51	42.50
Beta Blocker	49	40.83
Vasodilators	80	66.67
Other Combination		
Anticoagulant	50	41.67
Antiplatelet	68	56.67
Statins	79	65.83
Antidiabetic	40	33.33
PPIS	33	27.50

ACEI: Angiotensin-converting enzyme inhibitor, ARBS: Angiotensin 2 receptor blockers, CCB: Calcium channel blockers, PPIS: Proton pump inhibitors

Table 5: Evaluation of hypertension pharmacotherapy adherence to JNC-8 guidelines.

JNC Guidelines	Frequency (n=120)	Percentage (%)
Followed	57	47.5
Not Followed	63	52.5

Regarding medication profiles, the analysis indicated that various classes of antihypertensive medicines, along with combination therapies, were prescribed to the patients. The major classes of antihypertensives included vasodilators, diuretics, and beta-blockers, with prescription frequencies of 66.67%, 42.50%, and 40.83%, respectively. Statins were the most commonly used adjunctive medication prescribed to 65.83% of patients, followed by antiplatelets and anticoagulants at 56.67% and 41.67%, respectively (Table 4).

The analysis of prescriptions was conducted in accordance with the JNC-8 Guidelines for the management of hypertension. The results showed that about 47.5% of the prescriptions followed these guidelines, whereas 52.5% did not comply (Table 5).

DISCUSSION

This study' findings provide valuable insights into the hypertension-associated comorbidities and pharmacotherapy of hypertension among junior house officers, particularly in the context of adherence to the JNC-8 Guidelines.

Demographically, our study population (52.5% males, 47.5% females) reflects the World Health Organization (WHO's) reported higher hypertension prevalence among males, particularly in middle and old age[12]. The age distribution, peaking at 51-60 years, aligns with epidemiological evidence demonstrating a positive correlation between age and prevalence of hypertension[13]. This age-related association has important clinical implications, as older patients typically present with multiple comorbidities, necessitating nuanced hypertension management strategies.

Our study revealed a high prevalence of diabetes mellitus(41.7%) among hypertensive patients, consistent with the findings of Mannan et al. that diabetes frequently co-occurs with hypertension, thereby significantly increasing the risk of cardiovascular diseases[14]. Presence of additional comorbidities, including CHF and IHD, underscores the importance of implementing comprehensive management strategies that address both hypertension and associated conditions [15].

The prescription pattern in our study revealed a predominance of vasodilators (67%), diuretics (43%), and beta-blockers (41%) as the first-line antihypertensive therapies. This mirrors current clinical practice guidelines, which advocate the use of these medication classes across different hypertension stages, highlighting their therapeutic effectiveness [16]. Our study revealed a notable trend towards a combination therapy, with a substantial proportion of patients receiving concurrent statins, antiplatelets, and anticoagulants[17]. Although combination therapy may offer therapeutic benefits, it also poses risks related to polypharmacy and medication non-adherence [18].

Our findings indicate that approximately 47.5% of prescriptions followed these guidelines, while 52.5% of prescriptions did not. This reveals a notable disparity in hypertension management within the studied population, echoing earlier research that highlighted suboptimal adherence to clinical guidelines among healthcare providers. Consistent with Awan et al.'s observation that 42% of prescriptions deviated from established hypertension treatment guidelines, our study underscores a persistent trend of noncompliance among healthcare professionals [19].

We demonstrated the presence of diabetes mellitus and IHD in patients presenting with hypertension. This study highlights a critical knowledge gap in hypertension management among JHOs, underscoring the need for targeted educational interventions. Enhanced training programs, incorporating seminars and continuous medical education, may improve adherence to clinical guidelines and ultimately enhance patient outcomes. Future studies should elucidate the barriers to guideline adherence and evaluate the effectiveness of educational strategies in diverse healthcare settings.

CONCLUSION

Hypertension was reported more in male and old age patients. Diabetes mellitus and IHD were the most common comorbidities found in hypertensive patients. This study highlights significant gaps in guideline adherence among junior house officers managing hypertension, with only 47.5% of prescriptions aligning with JNC-8 recommendations. The frequent presence of comorbidities, such as diabetes and IHD, underscores the complexity of hypertension management, particularly in older patients. The common use of combination therapies raises concerns about potential polypharmacy issues. To enhance guideline adherence and improve patient outcomes, focused educational interventions and ongoing support for junior house officers are essential. These findings suggest a need for strengthened training efforts in hypertension management within healthcare settings.

ETHICAL APPROVAL: *Reference number: FA16-PHM-060/ ATD, Date: 18-1-2021*
CONSENT FOR PUBLICATION: *Written, informed consent was obtained from the study participants.*
AVAILABILITY OF DATA: *Data is available from the corresponding author on a justified request.*
FINANCIAL DISCLOSURE/ FUNDING: *None*
ARTIFICIAL INTELLIGENCE TOOLS DISCLOSURE: *None*
CONFLICT OF INTEREST: *None*
ACKNOWLEDGEMENT: *None*
AUTHORS' CONTRIBUTION

- ***Saqib Khan:*** *Acquisition, Analysis and interpretation of data, Critical revision*
- ***Muhammad Ahsan:*** *Acquisition of data, drafting*
- ***Ayesha Mushtaq:*** *Analysis and interpretation of data , drafting, critical revision*

REFERENCES

1. Flack JM, Adekola B. Blood pressure and the new ACC/AHA hypertension guidelines. Trends Cardiovasc Med. 2020 Apr;30(3):160-164. https:// doi.org/ 10.1016/j.tcm.2019.05.003.
2. An J, Luong T, Qian L, Wei R, Liu R, Muntner P, et al. Treatment patterns and blood pressure control with initiation of combination versus monotherapy antihypertensive regimens. Hypertension. 2021 Jan;77(1):103-113. https:// doi.org/10.1161/HYPERTENSIONAHA.120.15462.
3. Ahmad N, Khan AH, Khan I, Khan A, Atif M. Doctors' knowledge of hypertension guidelines recommendations reflected in their practice. Int J Hypertens. 2018 Mar 12;2018:8524063. https:// doi.org/ 10.1155/2018/8524063.
4. Ataro BA, Mulatu G, Mengistu D. Compliance with guidelines of hypertension management, and associated factors among the health practitioners. Inquiry. 2023 Jan-Dec;60:469580231216400. https:// doi.org/ 10.1177/00469580231216400.

5. Qureshi NN, Hatcher J, Chaturvedi N, Jafar TH. Effect of general practitioner education on adherence to antihypertensive drugs: cluster randomised controlled trial. BMJ. 2007 Nov 17;335(7628):1030-1037. https:// doi.org/ 10.1136/bmj.39360.617986.AE.
6. Philip R, Beaney T, Appelbaum N, Gonzalvez CR, Koldeweij C, Golestaneh AK, et al. Variation in hypertension clinical practice guidelines: a global comparison. BMC Med. 2021 May 12;19(1):117. https://doi.org/10.1186/s12916-021-01963-0.
7. Mehta SS, Wilcox CS, Schulman KA. Treatment of hypertension in patients with comorbidities: results from the study of hypertensive prescribing practices (SHyPP). Am J Hypertens. Apr1999; 12(4):333-340. https://doi.org/10.1016/S0895-7061(98)00270-2.
8. Sohn IS, Kim CJ, Yoo BS, Kim BJ, Choi JW, Kim DI, et al. Clinical impact of guideline-based practice and patients' adherence in uncontrolled hypertension. Clin Hypertens. 2021 Dec 15;27(1):26-32. https:// doi.org/ 10.1186/s40885-021-00183-1.
9. Judd E, Calhoun DA. Management of hypertension in CKD: beyond the guidelines. Adv Chronic Kidney Dis. 2015 Mar;22(2):116-122. https:// doi.org/ 10.1053/j.ackd.2014.12.001.
10. Williams B, Mancia G, Spiering W, Agabiti Rosei E, Azizi M, Burnier M,et al. ESC Scientific Document Group. 2018 ESC/ESH Guidelines for the management of arterial hypertension. Eur Heart J. 2018 Sep 1;39(33):3021-3104. https:// doi.org/ 10.1093/eurheartj/ehy339.
11. Tavakoly Sany SB, Peyman N, Behzhad F, Esmaeily H, Taghipoor A, Ferns G. Health providers' communication skills training affects hypertension outcomes. Med Teach. 2018 Feb;40(2):154-163. https:// doi.org/ 10.1080/0142159X.2017.1395002.
12. World Health Organization. Hypertension{internet}. 2023 Mar 16[cited 2024 Jun 3]. Available from: https://www.who.int/news-room/fact-sheets/detail/hypertension.
13. Santosa A, Zhang Y, Weinehall L, Zhao G, Wang N, Zhao Q, et al. Gender differences and determinants of prevalence, awareness, treatment and control of hypertension among adults in China and Sweden. BMC Public Health. 2020; 20: 1763. https://doi.org/10.1186/s12889-020-09862-4.
14. Mannan A, Akter KM, Akter F, Chy NU, Alam N, Pinky SD, et al. Association between comorbidity and health-related quality of life in a hypertensive population: a hospital-based study in Bangladesh. BMC Public Health. 2022; 22:181. https://doi.org/10.1186/s12889-022-12562-w.
15. Boyd CM, Darer J, Boult C, Fried LP, Boult L, Wu AW. Clinical practice guidelines and quality of care for older patients with multiple comorbid diseases: implications for pay for performance. JAMA. 2005 Aug 10;294(6):716-724. https:// doi.org/ 10.1001/jama.294.6.716.
16. McEvoy JW, McCarthy CP, Bruno RM, Brouwers S, Canavan MD, Ceconi C, et al. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension. Eur Heart J. 2024 Oct 7;45(38):3912-4018. doi: 10.1093/eurheartj/ehae178. Erratum in: Eur Heart J. 2025 Feb 11:ehaf031. https:// doi.org/ 10.1093/eurheartj/ehaf031.
17. Kwakye AO, Kretchy IA, Oppong KG. Polypharmacy and its associated factors among patients with co-morbid hypertension and diabetes in a municipal hospital in Ghana. Sci Afr. 2024 Mar 23: e02028. https://doi.org/10.1016/j.sciaf.2023.e02028.
18. Alsanosi SM, Mousa AH, Ahmadini HA, Qadhi RS, Ikram N, Felemban AH, et al. Polypharmacy among patients with hypertension attending primary healthcare centres. Ann Med Surg (Lond). 2023 May 10;85(6):2545-2549. https:// doi.org/ 10.1097/MS9.0000000000000818.
19. Mahmood S, Jalal Z, Hadi MA, Orooj H, Shah KU. Non-adherence to prescribed antihypertensives in primary, secondary and tertiary healthcare settings in Islamabad, Pakistan: a cross-sectional study. Patient Prefer Adherence. 2020 Jan 14;14:73-85. https:// doi.org/ 10.2147/PPA.S235517.
