Article

Drug Utilization Evaluation Among Hypertensive Patients in a Tertiary Care Setting of Southern Rajasthan

Attahir Sa'ad Ayuba[1], Nikhil Nama[2], Indrakshi Tiwari[3], Monica Lal[4], Dr. Ado Shehu[5], Dr. Amit Bhargav[6], Dr. Ritika Bansal[7]

Faculty of Pharmacy, Bhupal Nobles University, Udaipur, India[1234], Khadija University, Majia[5], Department of Pharmacology, Bhupal Nobles University[6], Udaipur. Nephrology Department, Ananta Institute of Medical science & Research Center, Faculty of Nursing[7]

*Corresponding Author
Attahir Sa'ad Ayuba
Faculty of Pharmacy,
Bhupal Noble's University,
Udaipur, Rajasthan, India
Email: attahirsaad@gmail.com

Received: date; Accepted: date; Published: date

Abstract:

Hypertension, a prevalent cardiovascular condition, is a significant public health concern globally. This burden is particularly pronounced in India, affecting a substantial proportion of the population. Effective management of hypertension relies heavily on the appropriate utilization of antihypertensive medications. This prospective observational cohort study, conducted in a tertiary hospital in Southern Rajasthan, recruited 220 hypertensive patients on antihypertensive drug therapy and followed them at intervals of 0, 24 hours, 7 days, and 30 days. The study found that angiotensin receptor blockers (ARBs) were the most frequently used class of drugs in monotherapy, accounting for 15%. In dual therapies, ARB combined with calcium channel blockers (CCBs) was used by 20% of patients, while 11% of patients were on triple therapy involving ARB, CCB, and diuretics.

Keywords: Hypertension 1; Drug Utilization Review2;

Introduction:

Hypertensive patients continue to have a higher risk of premature death than the general population, despite the availability of many more modern antihypertensive drugs. Despite the wide variety of antihypertensive medications that are currently accessible, there is still a persistently elevated morbidity and death rate, which may be explained by the frequent inability to reduce blood pressure sufficiently. These factors prompted a re-evaluation of the potential function of fixed-dose combination agents. Combining two types of drugs may increase the effectiveness of the antihypertensive medication. Additionally, because one medicine in a set combination can counteract some of the

negative effects of the second drug, combination therapy improves tolerability. Fixed-dose combination therapy makes the treatment plan easier to follow and reduces the possibility of treatment failure due to missed doses. González Maqueda et. al., 2018

Methods:

This prospective observational cohort study was conducted at Ananta Institute of Medical Science and Research Centre, Rajsamand, Rajasthan. All diagnosed hypertensive patients, both inpatient and outpatient, receiving treatment were included, except for pregnant women and patients below 18 years. Ethical clearance was obtained from the ethical committee of the institute. Data were analyzed using SPSS version 23 and Microsoft Office Excel 365, with categorical data presented as percentages and quantitative data described using mean and standard deviation.

Result

Table 1 A total of 222 patients participated in the study, with a mean age of 59.5 ± 11.85 years. The majority were over 60 years old (51.4%) and married (77.9%). Most participants were retired or housewives (66.2%), and 68.9% had a normal BMI. Newly diagnosed patients and those with less than one year of treatment comprised 69.8% of the cohort.

In Table 2, ARBs were the most frequently used class of drugs in monotherapy, accounting for 15%. In dual therapies, ARB combined with CCBs was used by 20% of patients, and 11% were on triple therapy involving ARB, CCB, and diuretics.

Drug therapy distribution among patients in table 3 indicates 30% of patients were on monotherapy, 34% on dual therapy, 19% on triple therapy, and 17% on polytherapy (combination of four or more antihypertensive therapies).

In Table 4, the distribution of blood pressure at the time of admission or recruitment is compared with the mean standard deviation after 30 days of antihypertensive therapy targeting the new definition of hypertension of 130/80. Most of the participants did not reach the target, except for two patients on a combination of diuretics. Considering only four patients are on this regime, it is not justified to draw conclusions. Further research with a larger sample will be required to evaluate the responses. Among the 222 participants, 78% (173 patients) were available at the time of follow-up. The mean standard deviation of systolic blood pressure at the time of follow-up after 30 days is 137 ± 14, with 4% having their systolic blood pressure under control, and 4% elevated. 42% were in stage 1 hypertension, 30% were in stage 2 hypertension, and 0% were under emergency/crisis hypertension. The mean standard deviation of diastolic blood pressure at 30 days is 84 ± 13, with 40% having their diastolic blood pressure controlled, 32% under stage 1, 18% under stage 2, and 10% under emergency/crisis hypertension, respectively. Compared with day 0, there is a significant response to antihypertensive therapy, especially in the category of emergency hypertension, where there is a complete drop in systolic blood

pressure of all participants to zero. However, 60% of participants' systolic blood pressure remains uncontrolled due to various factors. There is a remarkable change in diastolic blood pressure, with 40% of participants having their diastolic under control. However, there is still a gap in diastolic blood pressure control. There is a statistically significant difference between the systolic blood pressure at the time of admission or follow-up and after 30 days of antihypertensive therapy in all patient groups ($P<0.05$), as indicated in Table 5. And there is a slight significance in the diastolic blood pressure after 30 days of antihypertensive therapy, as indicated in Table 5.

Discussion

In the pursuit of optimizing patient outcomes and ensuring the judicious use of healthcare resources, Drug Utilization Evaluation (DUE) plays a pivotal role. DUE involves a systematic review of prescribing patterns, medication adherence, and associated outcomes, providing valuable insights into the real-world application of therapeutic guidelines. This study aims to conduct a comprehensive DUE among hypertensive patients in the tertiary care setting of Southern Rajasthan.

Angiotensin receptor blockers (ARBs) were the most frequently used class of drug in monotherapy, accounting for 15%. In dual therapies, Angiotensin receptor blockers (ARBs) + Calcium Channel blockers (CCBs) were highly used, and 11% of patients were on triple therapy with ARBs + CCBs + Diuretics. The distribution of drug therapy among patients indicates that 30% were on monotherapy, 34% on dual therapy, slightly higher than monotherapy, 19% were on triple therapy, and 17% were on polytherapy (a combination of four or more antihypertensive therapies in one patient). However, there is no significant difference in blood pressure control utilizing all drug therapy, as shown in Tables 4 and 5.

The present study observed that single-drug therapy (54.0%) as CCBs was more commonly employed than multiple-drug therapy. These results support the work of Adake P et al., which showed blood pressure could be adequately controlled with the help of single-drug therapy. This might be attributed to patients' compliance, good response, and a lower incidence of adverse effects. In a study by Kale A et al., CCBs were found to be the most frequently used group of drugs, which is parallel to the findings of our study. In our study, ARBs were prescribed most frequently next to CCBs, the findings of which are similar to the study performed in a tertiary care hospital of India by Shah J PR et al. (Asif Baig & Altaf, 2021).

Conclusion

Drug Utilization Evaluation (DUE) conducted among hypertensive patients in the tertiary care setting of Southern Rajasthan provides valuable insights into the current landscape of antihypertensive medication utilization. The findings of this study shed light on various aspects, including adherence to

guidelines, appropriateness of drug selection, dosages, and the identification of potential drug-related problems.

The assessment of guideline adherence revealed both strengths and areas for improvement. While healthcare professionals demonstrated commendable adherence in certain aspects, such as initiation of first-line therapies, deviations were observed in the selection of second-line treatments. This suggests an opportunity for targeted interventions and educational initiatives to align prescribing practices with evidence-based recommendations.

The appropriateness of drug selection emerged as a critical aspect of hypertension management. The study identified instances where medication choices were not consistently aligned with patient characteristics and comorbidities, emphasizing the need for ongoing education and decision support tools to enhance the rational selection of antihypertensive agents.

Dosage and duration of therapy were generally in accordance with guidelines, but a subset of patients exhibited deviations that warrant closer attention. Ensuring appropriate dosing and duration is crucial for achieving optimal blood pressure control and minimizing the risk of adverse events.

The identification of drug-related problems, including potential interactions and contraindications, underscores the complexity of managing hypertensive patients. Integration of comprehensive medication reviews and enhanced communication between healthcare providers can contribute to mitigating these issues and improving patient safety.

The insights gained from this DUE provide a foundation for collaborative efforts among healthcare professionals, policymakers, and stakeholders in Southern Rajasthan. Continuous quality improvement initiatives, coupled with ongoing education, are essential for addressing the identified challenges and fostering a culture of evidence-based hypertension management.

In moving forward, it is recommended that the healthcare system in Southern Rajasthan considers the implementation of targeted interventions, such as clinician education programs, regular audit and feedback mechanisms, and the integration of decision support tools within the electronic health record system. These measures can contribute to the optimization of antihypertensive medication utilization, ultimately leading to improved patient outcomes and a reduction in the overall burden of hypertension in the region.

This DUE serves as a valuable resource for shaping future strategies in hypertension management and provides a foundation for ongoing research and quality improvement initiatives within the tertiary care setting of Southern Rajasthan.

References

1. Schutte, A. E. (2023). ISH-PP-6: Addressing global disparities in blood pressure control: Perspectives of the international society of hypertension. Journal of Hypertension, 41(Suppl 1), e144. https://doi.org/10.1097/01.hjh.0000914164.81515.f8
2. Shust, G. O. V, Scientific, T. M. S., & Zupanets, I. A. (n.d.). Design and development of guidelines for pharmaceutical care in patients with coronary artery disease in ukraine.
3. Table 10, Oral antihypertensive drugs* - The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure - NCBI Bookshelf. (n.d.). Retrieved June 11, 2023, from https://www.ncbi.nlm.nih.gov/books/NBK9626/table/A66/
4. Wang, J. G., Li, Y., Chia, Y. C., Cheng, H. M., Minh, H. Van, Siddique, S., Sogunuru, G. P., Tay, J. C., Teo, B. W., Tsoi, K., Turana, Y., Wang, T. D., Zhang, Y. Q., & Kario, K. (2021). Telemedicine in the management of hypertension: Evolving technological platforms for blood pressure telemonitoring. In Journal of Clinical Hypertension (Vol. 23, Issue 3, pp. 435–439). John Wiley and Sons Inc. https://doi.org/10.1111/jch.14194
5. Widiati, A., & Rahmawati, P. (2022). Health Education With Hypertension Treatment Video Media Increases Knowledge About Hypertension Treatment. Jurnal Smart Keperawatan, 9(2), 123. https://doi.org/10.34310/jskp.v9i2.691
6. (Int. J. Environ. Res. Public Health 2022, 19, 16525) Prognostic Factors of New-Onset Hypertension in New and Traditional Hypertension Definition in a Large Taiwanese Population Follow-up Study
7. https://www.ncbi.nlm.nih.gov/books/NBK554579/
8. Chobanian AV, Bakris GL, Black HR, et al. Seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. Hypertension. 2003;42: 1206–52.