



Original Research Article

Therapeutic Inertia in Uncontrolled Hypertension: A Mixed-Methods Analysis of Physician, Patient and System-Level Barriers in Family Medicine

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Abstract: Therapeutic inertia—defined as failure to initiate or intensify antihypertensive therapy despite persistently elevated blood pressure—remains a major obstacle to optimal hypertension control in primary care. Despite the availability of effective treatment strategies, a substantial proportion of patients continue to have uncontrolled blood pressure, increasing their long-term cardiovascular risk. Objective: To determine the prevalence of therapeutic inertia among patients with uncontrolled hypertension and to explore physician-, patient-, and system-related factors contributing to failure of treatment intensification in a family medicine setting using a mixed-methods approach. Methods: A convergent mixed-methods study was conducted in a family medicine clinic over a one-year period (January 2023–December 2023). Quantitative data from electronic medical records of adult patients with uncontrolled hypertension were analyzed to assess blood pressure control, treatment patterns, and prevalence of therapeutic inertia. Therapeutic inertia was defined as absence of treatment intensification despite persistently elevated blood pressure across consecutive visits. Qualitative data were obtained through semi-structured interviews with family physicians and patients to explore perceived barriers to treatment escalation. Quantitative data were analyzed descriptively and comparatively, while qualitative data were analyzed using thematic analysis. Results: Among 312 patients with uncontrolled hypertension, therapeutic inertia was identified in 46.8%. Patients experiencing therapeutic inertia had higher systolic and diastolic blood pressure levels and were less likely to achieve subsequent blood pressure control compared with those whose treatment was intensified. Monotherapy predominated among patients with therapeutic inertia, whereas combination therapy was more frequently used in patients who underwent treatment escalation and was associated with greater blood pressure reduction. Qualitative analysis revealed three major contributors to therapeutic inertia: physician-related factors (concerns about adverse effects, polypharmacy, and limited consultation time), patient-related factors (fear of medication escalation, low perceived disease severity, and inadequate understanding of long-term risks), and system-level barriers (fragmented care, delayed follow-up, and limited monitoring resources). Conclusion: Therapeutic inertia affects nearly half of patients with uncontrolled hypertension in family medicine practice and arises from a complex interaction of clinician, patient, and healthcare system factors. Targeted interventions addressing clinical decision-making, patient engagement, and care delivery structures are urgently needed to improve blood pressure control and reduce cardiovascular risk in primary care populations.

Keywords: Therapeutic inertia; uncontrolled hypertension; primary care; family medicine; treatment intensification; mixed-methods research



INTRODUCTION

Hypertension remains one of the leading global contributors to cardiovascular morbidity and mortality, accounting for a substantial proportion of preventable adverse outcomes. Although lifestyle modification plays an important role, pharmacological therapy remains the cornerstone of effective blood pressure control for most patients. However, despite the availability of clear evidence-based guidelines and effective antihypertensive agents, blood pressure control rates remain suboptimal in real-world clinical practice, particularly in primary care settings.

Therapeutic inertia—commonly defined as failure to initiate or intensify treatment when therapeutic goals are unmet—has emerged as a key contributor to persistent uncontrolled hypertension. Numerous studies across diverse healthcare systems have demonstrated that treatment escalation is frequently delayed or omitted, resulting in prolonged exposure to elevated blood pressure and increased cardiovascular risk.

The causes of therapeutic inertia are multifactorial. Physician-related factors include concerns about adverse drug effects, uncertainty regarding guideline thresholds, competing clinical priorities, and limited consultation time. Patient-related factors such as fear of side effects, low health literacy, poor adherence, and asymptomatic perception of disease further complicate treatment decisions. In addition, system-level barriers—fragmented care, inadequate follow-up mechanisms, and high patient volumes—may reinforce inertia in routine practice.

Emerging evidence suggests that therapeutic inertia should not be viewed solely as passive non-action, but rather as a modifiable process influenced by treatment strategies and healthcare structures. Early use of combination therapy has been shown to improve blood pressure control and reduce inertia compared with stepwise monotherapy; however, such approaches remain underutilized in primary care.

While most existing studies have quantified the prevalence of therapeutic inertia, fewer have explored the contextual and behavioral factors underlying clinical decision-making. Mixed-methods research offers a comprehensive approach by integrating quantitative outcomes with qualitative insights from physicians and patients. This study therefore aimed to assess the prevalence of therapeutic inertia in uncontrolled hypertension and to explore the physician-, patient-, and system-level barriers contributing to delayed treatment intensification in a family medicine setting.

2. Materials and Methods

2.1 Study Design

A convergent mixed-methods design was employed, integrating quantitative analysis of clinical data with qualitative interviews of physicians and patients.

2.2 Study Setting and Population

The study was conducted at a family medicine clinic providing longitudinal care to adult patients with chronic diseases. The quantitative component included adult patients diagnosed with hypertension who had persistently uncontrolled blood pressure during the study period (January 2023–December 2023) despite ongoing antihypertensive therapy. Physicians involved in hypertension management and a purposive sample of patients were recruited for the qualitative component.

2.3 Data Collection

Quantitative Data:

Clinical data were extracted from electronic medical records, including demographics, comorbidities, blood pressure measurements, antihypertensive regimens, treatment changes, and follow-up intervals. Therapeutic inertia was defined as absence of treatment intensification—dose escalation, addition of a new antihypertensive class, or switch to combination therapy—despite persistently elevated blood pressure across consecutive visits.

Qualitative Data:

Semi-structured interviews were conducted with physicians and patients to explore perceptions of blood pressure control, attitudes toward treatment escalation, and perceived barriers to optimal hypertension management. Interviews were audio-recorded, transcribed verbatim, anonymized, and continued until thematic saturation was achieved.

2.4 Data Analysis

Quantitative variables were summarized using means and standard deviations or frequencies and proportions, as appropriate. Comparative analyses were performed between patients with and without therapeutic inertia. Qualitative data were analyzed using thematic analysis, involving iterative coding, categorization, and development of themes. Quantitative and qualitative findings were integrated during interpretation to provide a comprehensive understanding of therapeutic inertia.

2.5 Ethical Considerations

The study was conducted in accordance with the Declaration of Helsinki. Ethical approval was obtained from the institutional ethics committee, and written informed consent was obtained from all

interview participants. Patient data were anonymized to ensure confidentiality.

RESULTS

Participant Characteristics

A total of 312 patients were included in the quantitative analysis, with a mean age of 58.4 ± 11.6 years; 54.8% were male. Most patients had at least one comorbidity, most commonly type 2 diabetes mellitus and dyslipidemia. Eighteen family physicians and twenty-two patients participated in the qualitative interviews.

Table 1. Baseline Characteristics of the Study Population (N = 312)

Characteristic	Overall (n = 312)	Therapeutic Inertia (n = 146)	No Inertia (n = 166)
Age, mean ± SD (years)	58.4 ± 11.6	61.2 ± 10.9	56.0 ± 11.8
Male sex, n (%)	171 (54.8)	82 (56.2)	89 (53.6)
Duration of hypertension ≥5 years, n (%)	187 (59.9)	103 (70.5)	84 (50.6)
Type 2 diabetes, n (%)	124 (39.7)	71 (48.6)	53 (31.9)
Dyslipidemia, n (%)	178 (57.1)	92 (63.0)	86 (51.8)
Baseline SBP (mmHg), mean ± SD	152.6 ± 11.4	156.8 ± 10.9	148.9 ± 10.8
Baseline DBP (mmHg), mean ± SD	92.1 ± 8.3	94.5 ± 7.9	89.9 ± 8.2

Prevalence of Therapeutic Inertia

Therapeutic inertia was identified in 46.8% of patients with uncontrolled hypertension. Patients experiencing therapeutic inertia had higher systolic and diastolic blood pressure levels and were less likely to achieve subsequent blood pressure control compared with patients whose treatment was intensified.

Treatment Patterns and Outcomes

Monotherapy predominated among patients with therapeutic inertia, whereas combination therapy was more frequently prescribed in patients undergoing treatment intensification. Treatment intensification was associated with significantly greater reductions in systolic and diastolic blood pressure and higher rates of blood pressure control.

Table 2. Antihypertensive Treatment Patterns and Clinical Response

Treatment Characteristic	Therapeutic Inertia (n = 146)	No Inertia (n = 166)
Monotherapy, n (%)	94 (64.4)	48 (28.9)
Dual therapy, n (%)	39 (26.7)	87 (52.4)
Triple therapy, n (%)	13 (8.9)	31 (18.7)
Mean SBP reduction (mmHg)	4.8 ± 6.2	13.6 ± 8.4
Mean DBP reduction (mmHg)	3.1 ± 5.4	8.9 ± 6.1
Achieved BP control, n (%)	29 (19.9)	92 (55.4)

Qualitative Findings

Three major themes emerged:

1. Physician-related barriers: concerns about adverse effects, polypharmacy in older patients, uncertainty regarding adherence, and limited consultation time.
2. Patient-related barriers: fear of medication escalation, misconceptions regarding asymptomatic disease, and inadequate understanding of long-term cardiovascular risk.
3. System-level barriers: fragmented care, delayed follow-up, and limited access to home blood pressure monitoring.

Table 3. Key Themes and Representative Findings From Qualitative Analysis

Theme	Key Observations
Physician-related barriers	Cautious prescribing, concern over adverse effects, limited consultation time
Patient-related barriers	Fear of medication escalation, low perceived severity, adherence concerns
System-level barriers	Short follow-up intervals, fragmented care, limited monitoring resources

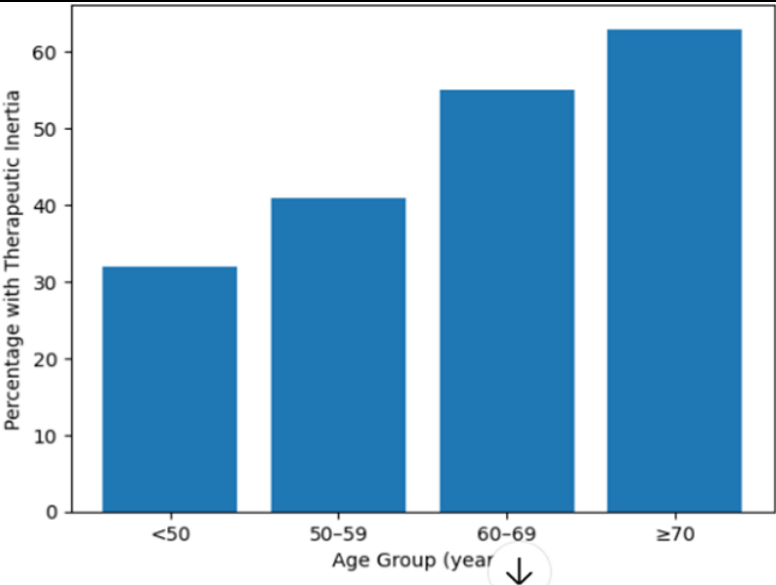


Figure 1. Proportion of Patients Experiencing Therapeutic Inertia According to Age Group and Treatment Regimen

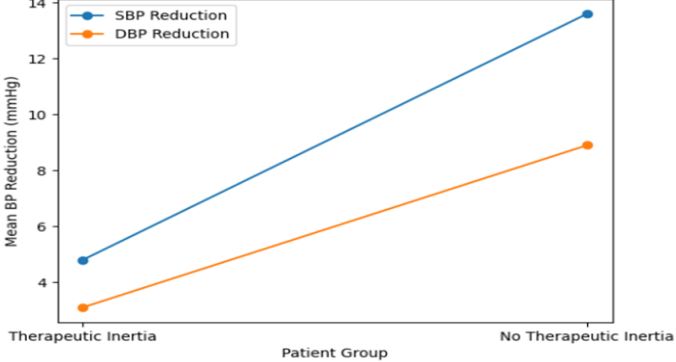


Figure 2. Comparison of Blood Pressure Reduction Between Patients With and Without Therapeutic Inertia

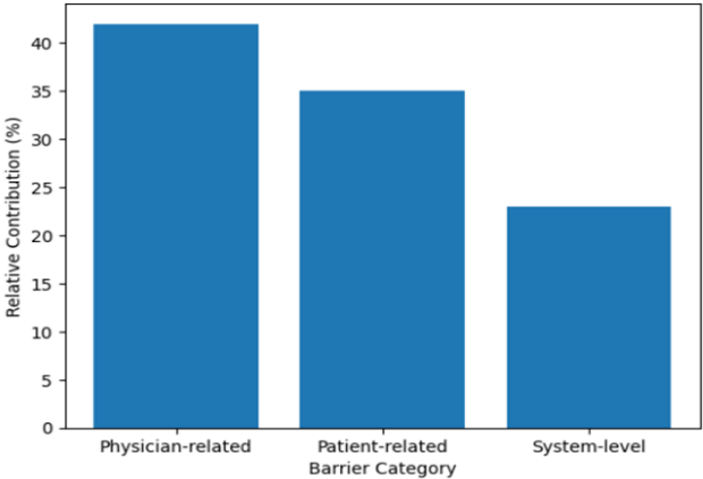


Figure 3. Conceptual Framework Illustrating Physician-, Patient-, and System-Level Contributors to Therapeutic Inertia

DISCUSSION

This mixed-methods study confirms that therapeutic

inertia remains a leading cause of suboptimal blood pressure control in family medicine. Nearly half of patients with uncontrolled hypertension did not undergo treatment intensification despite repeated elevated readings. These findings align with population-based and primary care studies showing persistent gaps between guideline recommendations and real-world hypertension management (9,10).

Older age, longer hypertension duration, multimorbidity, and treatment with monotherapy were significantly associated with therapeutic inertia. These findings are consistent with prior reports suggesting that clinicians may hesitate to intensify treatment in elderly or complex patients because of concerns regarding adverse effects, frailty, and treatment burden (9,12). While clinically understandable, such caution may unnecessarily prolong exposure to uncontrolled blood pressure and increase cardiovascular risk.

Patients whose therapy was intensified experienced substantially greater blood pressure reductions, highlighting the clinical value of timely treatment adjustment. This supports evidence from large studies demonstrating the superiority of combination therapy and proactive treatment strategies in achieving blood pressure control and preventing resistant hypertension (10,14). However, many patients with therapeutic inertia remained on monotherapy, indicating underuse of evidence-based approaches in routine practice.

Qualitative findings identified physician-related factors as the primary drivers of therapeutic inertia, including concerns about polypharmacy, uncertainty regarding adherence, and limited consultation time. Similar barriers have been reported across diverse healthcare systems, indicating that therapeutic inertia is a global challenge (12). These results support the need for clinician-focused interventions such as decision-support tools and structured follow-up pathways.

Patient-related factors, particularly misperceptions about disease severity and fear of medication escalation, further contributed to resistance to treatment intensification. Many patients equated the absence of symptoms with adequate control, a well-recognized barrier in chronic disease management (13), underscoring the importance of patient education and shared decision-making.

System-level barriers, including limited access to follow-up, fragmented care, and underutilization of home blood pressure monitoring, also played a role. Evidence suggests that self-measured blood pressure monitoring improves treatment decisions and patient engagement in primary care settings (11).

Although brachial blood pressure measurement remains standard, emerging evidence indicates that central aortic pressure may offer additional prognostic value in treated hypertension (15). While not assessed in this study, its future integration may help reduce clinical uncertainty and support more timely treatment intensification.

5. Conclusion

Therapeutic inertia is a major contributor to persistently uncontrolled hypertension in family medicine practice. Addressing this challenge requires coordinated interventions targeting clinician decision-making, patient education and engagement, and healthcare system inefficiencies. Reducing therapeutic inertia has the potential to substantially improve blood pressure control and lower long-term cardiovascular risk in primary care populations.

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