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Research Article

Physician-pharmacist collaboration versus usual care for treatment-resistant hypertension

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Abstract

Team-based care has been recommended for patients with treatment-resistant hypertension (TRH), but its efficacy in this setting is unknown. We compared a physician-pharmacist collaborative model (PPCM) to usual care in patients with TRH participating in the Collaboration Among Pharmacists and Physicians To Improve Outcomes Now study. At baseline, 169 patients (27% of Collaboration Among Pharmacists and Physicians To Improve Outcomes Now patients) had TRH: 111 received the PPCM intervention and 58 received usual care. Baseline characteristics were similar between treatment arms. After 9 months, adjusted mean systolic blood pressure was reduced by 7 mm Hg more with PPCM intervention than usual care ($P = .036$). Blood pressure control was 34.2% with PPCM versus 25.9% with usual care (adjusted odds ratio, 1.92; 95% confidence interval, 0.33–11.2). These findings suggest that team-based care in the primary care setting may be effective for TRH. Additional research is needed regarding the long-term impact of these models and to identify patients most likely to benefit from team-based interventions. J Am Soc Hypertens 2016;10(4):307–317.

Keywords: Collaborative care; hypertension; treatment-resistant hypertension; pharmacist.

Introduction

Treatment-resistant hypertension (TRH), defined simply as requiring ≥4 antihypertensive agents to achieve blood pressure (BP) control,[1] is a clinically challenging hypertension phenotype that has been consistently linked with substantially decreased quality of life, increased cardiovascular risk, and increased mortality.[2–10] According to data from the National Health and Nutrition Examination Survey (NHANES), the prevalence of TRH appears to have more than doubled over the past quarter-century from 8.8% in 1988–1994 to 20.7% in 2005–2008.[11,12] Although the mechanisms underlying TRH development have not been elucidated, likely contributors include poor medication adherence, suboptimal antihypertensive regimens, obesity, alcohol consumption, high sodium intake, and concomitant use of medications that promote sodium retention or otherwise decrease antihypertensive efficacy.[12] Importantly, many of these contributing factors are modifiable, offering the potential for intervention.

Evidence-based treatment modalities for reducing BP in patients with TRH are limited at present. Many patients with TRH could benefit from optimization of

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antihypertensive regimens, yet studies on the most appropriate three- and four-drug antihypertensive combinations are virtually nonexistent. Aldosterone receptor antagonists have the most compelling evidence for lowering BP in TRH,[13,14] but their use remains quite limited in this population.[15] In addition, recent phase 3 studies suggest a limited benefit to nondrug interventions, such as renal denervation therapy and carotid baroreceptor activation in patients with TRH.[16,17] Thus, novel approaches are needed to address the modifiable factors contributing to TRH.

One approach that has demonstrated success in the general hypertension population is physician-pharmacist collaborative care.[18–22] A recent meta-analysis of 37 studies of team-based interventions found significantly decreased BP with patient education or pharmacist treatment recommendations.[18] Likewise, in the Collaboration Among Pharmacists and physicians To Improve Outcomes Now (CAPTION) study, physician-pharmacist collaboration was associated with a 6/3 mm Hg greater decrease in BP relative to usual care.[22] However, to our knowledge, collaborative care models have not been tested in patients with TRH. Accordingly, we aimed to compare a physician-pharmacist collaborative care model (PPCM) to usual hypertension care (from a primary care provider) among a geographically and racially diverse primary care patient population with TRH who were participating in the CAPTION study. We hypothesized that patients assigned to PPCM would achieve greater reductions in BP than those assigned to usual care from their primary care provider.

Methods

Full details of the design and principal results for CAPTION have been reported previously.[22,23] Briefly, CAPTION was a prospective, cluster-randomized, multicenter clinical trial in 32 medical offices across the United States. All participating clinics had an imbedded clinical pharmacist before enrollment in the trial. Offices were stratified by the percent of minority patients and level of clinical pharmacy services at each clinic and then randomly assigned to 1 of 3 groups in approximately equal proportion: a 9-month PPCM intervention, a 24-month PPCM intervention, or usual care (control). English- or Spanish-speaking patients were included if they met the following criteria: age >18 years, current diagnosis of hypertension, uncontrolled BP (>140 mm Hg systolic or >90 mm Hg diastolic for uncomplicated hypertension or >130 mm Hg systolic or >80 mm Hg diastolic for patients with diabetes mellitus or chronic kidney disease [CKD]) at study entry, and receiving care from the participating primary care office. Key patient exclusion criteria included left ventricular ejection fraction <35%, glomerular filtration rate <20 mL/min or documented proteinuria >1 gram/day. The study was approved by the respective Institutional Review Boards for each medical office.

Treatment Strategies

The recommended PPCM intervention included medical record review by the pharmacist and a structured interview, assessing medical history, knowledge of BP medication regimens, adherence, and other barriers to BP control at each visit. Pharmacist treatment recommendations were documented in care plans that were provided to the collaborating physician. The collaborating physician was then free to accept or modify the treatment plan, followed by implementation of the final plan by the pharmacist. The recommended visit schedule included a structured baseline visit, a call at 2 weeks and additional structured face-to-face visits at months 1, 2, 4, 6, and 8, with additional visits as needed. Because CAPTION was an implementation trial, pharmacist-physician teams could modify the proposed PPCM intervention schedule. Pharmacist and physician providers in offices randomized to the PPCM intervention arms also received additional training that focused on three areas: (1) strategies to overcome clinical inertia and patient barriers to achieve BP control; (2) education on JNC 7 and major antihypertensive trials (ie, ALLHAT), as well as use of treatment aids (eg, medication use cards, adherence aids); and, (3) methods for effective communication and collaboration between physicians and pharmacists. Providers were not educated specifically on TRH.

Primary care providers at clinics assigned to usual care received no additional training or instructions other than to continue usual hypertension care for enrolled patients. Pharmacists in usual care offices were instructed to avoid interventions for study participants with hypertension, but they could provide usual consultations if physicians specifically asked questions.

Cohort Development

For the present analysis, we restricted the CAPTION data set to patients taking ≥3 antihypertensive medications at study entry (ie, those who met the definition of TRH[1]), because all patients had uncontrolled BP as assessed by a structured research measurement (described in the following). We used this definition to encompass those with ''true'' and ''apparent'' TRH to increase generalizability of the study results. Furthermore, we did not require patients to be taking a diuretic as part of their baseline antihypertensive regimen because previous studies have demonstrated no difference in outcomes comparing a TRH definition requiring a diuretic and the more simple definition used here (ie, based on the number of antihypertensive drugs without regard to the presence of a diuretic).[2,4,5] Consistent with the overall CAPTION protocol approved by the study sponsor (NHLBI) and data