Hypertension: An Evidence Informed, Case Based Approach

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KEYWORDS

• Cardiovascular disease • Hypertension • High Blood Pressure • JNC • Guideline

KEY POINTS

- Despite longstanding knowledge of the consequences of uncontrolled hypertension and the availability of effective classes of antihypertensives, the understanding of optimal management is still incomplete, and the benefit of full implementation of existing evidence remains elusive.
- Guidelines face the challenge of providing busy clinicians with practical guidance and balancing rapidly evolving evidence, while keeping updates infrequent enough to allow time to be adopted.
- Supporting and encouraging patients to increase understanding of their chronic illnesses through employment of shared decision making is key to increasing compliance and maximizing benefit, with the ultimate goal of improving outcomes while minimizing risks for individual patients.
- Antihypertensive agent selection and target blood pressure requires placing an individual patient's comorbidities and characteristics in the context of available guidelines and subsequently published studies, with ultimate clinician and patient shared decision making to determine an optimal regimen.

BACKGROUND

On April 12, 1945, President Franklin D. Roosevelt, who had led the United States out of the Great Depression and guided the nation during World War II, was relaxing in Warm Springs, Georgia. While having his portrait painted, he complained of a severe headache and lost consciousness. Before he died of a cerebral hemorrhage, his cardiologist Dr. Howard G. Bruenn found his blood pressure (BP) to be 300/190 mm Hg.[1] Despite his prominence as the leader of the free world, medical care at this time had no effective treatments for the president's hypertension, contributing to his premature death at age 63 (**Fig. 1**).

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Fig. 1. Franklin D. Roosevelt in 1933, just 12 years prior to his premature death at age 63. (http://www.fdrlibrary.marist.edu/archives/collections/franklin/index.php?p=digitallibrary/digitalcontent&id=2178).

The president's death provides a window into the consequences of untreated hypertension[2] and provides today's clinicians with an appreciation of the wide range of antihypertensives now available. Medicine has progressed, and there are now the tools to prevent premature death and disability from a range of illnesses in which hypertension plays a key role. This article provides an overview of the development of the key evidence for treatment of hypertension, applies the most recent guidelines in a case-based approach, and considers the impact of more recently published studies on management decisions.

Following World War II, the efforts of the scientific community focused on health research rather than treatment of catastrophic injury. In June 1948, President Harry Truman signed the National Heart Act,[3] which lead to the creation of the National Heart, Lung, and Blood Institute and the longitudinal Framingham Heart Study.[4] This landmark study, which continues to this day, identified multiple risk factors associated with the development of cardiovascular disease (CVD) such as cholesterol, smoking, and hypertension.[5,6]

By 1967, a randomized placebo-controlled clinical trial was published demonstrating the cardiovascular benefit of antihypertensives (hydrochlorothiazide, reserpine, and hydralazine) in patients with diastolic hypertension.[7] By the 1970s, additional classes of medication were available, and the need for guidelines became necessary to provide practical recommendations,[8] define the appropriate population to treat, and provide guidance for agent selection.

The first Joint National Commission[8] guidelines (JNC1) were published in 1977 and recommended a 4 step approach to therapy, escalating coverage by adding