

How Low Can It Go? Trends, Benefits, and Risks of Expanding the Definition of Hypertension

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ABSTRACT

Hypertension is a strong risk factor for cardiovascular disease. However, the current criterion for hypertension in British Columbia was only recently established, and the international medical community has seen a push toward lowering blood pressure thresholds even closer toward normal levels. Is redefining this threshold truly beneficial in reducing the associated health risks? After examining the evolution of the definition of hypertension and weighing the major benefits and concerns, we support a definition based on a value where the benefits of lowering blood pressure threshold for hypertension have been proven to outweigh the harms.

KEYWORDS: *hypertension, prehypertension, cardiovascular disease, aging, trends*

INTRODUCTION

In 2009, an estimated 19 % of Canadians had hypertension or elevated blood pressure (BP).¹ Hypertension is strongly correlated with an increased risk of many adverse cardiovascular events such as myocardial infarction, stroke, and mortality.² Since aging is correlated with increased BP, and the number of seniors is expected to significantly increase over the next decade in BC, the anticipated increase in prevalence of hypertension poses a major healthcare concern.³ Currently, in the 2008 BC guidelines for hypertension, the BP diagnostic threshold is 140/90 mmHg over three office visits.² This criterion, however, was only agreed upon within the last decade.

Guidelines for the treatment of hypertension have changed dramatically over time.⁴ Results from clinical trials, epidemiological studies, and drug reviews have prompted its re-evaluation, usually toward lowering the blood pressure threshold deemed hypertensive. The Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure proposed a series of recommendations in 1977, setting a threshold of 160/95 mmHg and above for individualized drug treatment.⁵ The next major re-evaluation in 1984, also supported by the World Health Organization and International Society for Hypertension,⁶ lowered the threshold recommended for treatment to 140/90 mmHg based on epidemiological data linking BP to increased risks of mortality and morbidity.⁷ Canada, however, conservatively continued even in 2002 to define hypertension as 160/100 mmHg out of concern that the recommendation changes would increase the number of anti-hypertensive drug prescriptions.⁸ It was only in 2005 that the Canadian guidelines recommended therapy for those with 140/90

mmHg or above.⁹ That same year, new American standards were proposed to expand the definition, arguing that other risk factors have been ignored.¹⁰ This expansion may result in pre-hypertensive patients, between 120/80 and 139/89 mmHg, to also receive hypertension treatment. Whether this trend is beneficial for patients remains to be seen.

EARLY TREATMENT AS PREVENTION?

The potential health risks of pre-hypertension may warrant early treatment, especially due to the high risk of developing hypertension and related complications.¹¹ Cardiovascular and cerebrovascular diseases have also been correlated with pre-hypertension; starting at 115 mmHg, an increase of 20 mmHg in systolic BP is associated with a two-fold increased risk of ischemic heart disease and stroke,¹² while for diastolic BP, every 5 mmHg increase starting at 70 mmHg is associated with a 20 % increase in coronary risk.¹³ The Framingham Risk Assessment Chart also shows how increases in systolic BP above 120 mmHg translates to a higher risk of coronary heart disease within 10 years.² Taken together, these studies suggest that pre-hypertension, a risk factor for heart disease, should be reduced as close as possible to 120/80 mmHg.¹¹

However, will treating for pre-hypertension—in effect lowering the BP threshold for hypertension—improve patients' health outcomes? After all, medical professionals are concerned about the health of their patients, and treating pre-hypertension when unnecessary is unethical as well as dangerous. For instance, if diabetics undergoing insulin treatment are also given anti-hypertensive beta-blockers, then they are at an increased risk of developing severe hypoglycemia.¹⁵ Thus, if the BP goal for diabetics is lowered to below the current target of 130/80 mmHg,

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then a greater number of diabetics will be potentially harmed by anti-hypertensive drugs. As well, the top anti-hypertensive drug covered by Pharmacare, ramipril (Altace®),¹⁶ has potential side effects; as an angiotensin-converting enzyme inhibitor, it may cause acute renal failure, hyperkalemia, dry cough, and angiodema.¹⁷ Hence, unwarranted treatment of pre-hypertension may expose patients to unnecessary harms.

Even if the side effects were minimized, treating for pre-hypertension has not yielded the same benefits as has treating for hypertension. Authors of the Trial of Preventing Hypertension study suggested that treating pre-hypertension with angiotensin receptor blockers would prevent the progression of hypertension, implying that hypertension-related diseases were also prevented.¹⁸ However, the study has been criticized for having inappropriate endpoint criteria and potentially overestimating the benefits of preventing hypertension using anti-hypertensive drugs. In a *New England Journal of Medicine* editorial, Schunkert highlighted that greater than 50 % of participants in both the control and treated groups in the study eventually developed hypertension.¹⁹ Furthermore, the Cochrane intervention review on hypertension concluded that lowering the BP target below 140/90 mmHg does not reduce mortality or morbidity.²⁰ Even so, the Cochrane review was unable to find appropriate randomized controlled trials (RCTs) comparing systolic BP targets; only RCTs comparing diastolic BP thresholds were available for analysis.²⁰ Because systolic hypertension has a stronger association with cardiovascular diseases than diastolic hypertension, more studies may be necessary to confirm that lowering the systolic BP target below 140 mmHg does not benefit patient health outcomes.²¹ Consequently, the benefits of lowering the BP minimum for hypertension are debatable.

Changing the definition of hypertension could have a large impact on epidemiological health and resource management.²² Anti-hypertensive drugs are already one of the most frequently prescribed drugs in BC; for example, ramipril (Altace®) had the second highest number of Pharmacare beneficiaries in 2007 and 2008.¹⁶ However, if pre-hypertensive Canadians, comprising 20.1 % of the population, are added to the 19 % of the population who are hypertensive, we may see a doubling of those prescribed anti-hypertensive drugs, which will greatly burden the cash-strapped healthcare system. Furthermore, the World Health Organization has been concerned with studies whose authors are associated with pharmaceutical companies.²³ It is troubling that those advocating for more prescription of anti-hypertensive drugs may also benefit from their usage. Thus, given the limited resources of our health care system, we should question whether prescribing these drugs to 40 % of the population is the most effective method of improving patients’ cardiovascular health.

CONCLUSION

We have explored the evolution of defining hypertension and examined the literature on pre-hypertension and hypertension to find potential arguments for and against lowering the threshold. Definitions of hypertension have tended towards lowering thresholds and there have been recent efforts to push this even lower. Arguments for lowering BP thresholds generally revolve around decreasing cardiovascular risks associated with pre-hypertension whereas counterarguments point to the lack of benefits of treating pre-hypertensive patients. We believe that decreasing the BP threshold for hypertension under 140/90 mmHg is not warranted unless randomized controlled trials show that doing so confers more benefit than harm to patients. 

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