Prehypertension: Is It Relevant for Nephrologists?

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Prehypertension has been proposed as the diagnosis for the presence of blood pressures >120/80 mmHg but <140/90 mmHg. It covers more than 60 million people in the United States and nephrologists will increasingly be involved with them. This review describes its relevance to nephrologists.


Nephrologists will rarely deal with patients who have prehypertension (i.e., BP below hypertension [140/90 mmHg] but above ideal [120/80 mmHg]), which includes >60 million people in the United States (1). Because there are hardly enough nephrologists to care for the increasing number of patients with chronic kidney disease, why should they be concerned about patients who do not yet have hypertension?

The reasons include the following: First, multiple data show that people with prehypertension often have subclinical target organ damage, including nephropathy. Second, the families of patients with chronic kidney disease (CKD) harbor an increased prevalence of nephropathy, and they need early recognition. Third, if recognized, then it may be possible to reverse the usual progression into overt hypertension and thereby prevent patients from developing hypertension-related organ damage.

Evidence of Subclinical Target Organ Damage

During the past 10 yrs, a large body of evidence has shown the risks of prehypertensive levels of BP. Perhaps the most convincing are the data from the Prospective Studies Collaboration, which followed almost 1 million people with no previous vascular disease prospectively for a total of 12.7 million person-years in 61 observational studies (2) and examined the relationship between levels of BP and subsequent mortality. The data show a continuous increase in mortality from both stroke and ischemic heart disease from 115/75 mmHg, the lowest level with a large enough group that could be followed. In those with a 20-mmHg higher systolic BP or a 10-mmHg higher diastolic BP, mortality rates doubled; therefore, patients with BP of 135/85, well within the range of prehypertension, experienced a two-fold increase in death from cardiovascular diseases.

In addition to these mortality data, a number of studies of smaller populations have shown an increase in nonfatal target organ damage (3). For the sake of brevity, emphasis is placed on those that relate to the kidneys:

• Left ventricular hypertrophy (4)
• Coronary calcification (5)
• Reduced coronary flow reserve (6)
• Progression of coronary atherosclerosis (7)
• Increases in ischemic coronary disease and stroke (8)
• Poor cognitive function (9)
• Retinal vascular changes (10)
• Elevated serum uric acid (11)

Albuminuria in levels even below the level that defines microalbuminuria is predictive of both hypertension (12) and cardiovascular morbidity and mortality, independent of renal function, hypertension, or diabetes (13). Patients with prehypertension have an increased prevalence of microalbuminuria (14). In this study of almost 2700 patients, those with prehypertension had a prevalence of microalbuminuria of 4.9%, compared with a prevalence of 2.8% in those with normal BP. Similar associations have been reported from other populations (15). Of additional interest, serum uric acid, believed by some to be a major determinant of hypertension and atherosclerosis, is associated with microalbuminuria in individuals with prehypertension (16).

Predictors of Prehypertension

Because prehypertension is one step toward hypertension, the same factors are involved in the development of both. Obesity is foremost, with male gender and black race also involved (17). In addition, these factors are associated with more prehypertension: Diabetes, impaired glucose tolerance, the metabolic syndrome, dyslipidemia, and smoking (18).

Perhaps the main reason that nephrologists should consider prehypertension is their opportunity to identify many of those who are most likely to develop it: The families of their patients with CKD or ESRD. As shown in the Kidney Evaluation and Awareness Program in Sheffield (KEAPS) trial, relatives of
patients with CKD were six times more likely to have microalbuminuria than nonrelatives (19). With the association of prehypertension with microalbuminuria, it is likely that many individuals with prehypertension would be identified with screening. That a relative has CKD should motivate those identified to change lifestyle or take medication to prevent developing CKD.

**Value of Therapy**

Both lifestyle changes (20) and drug therapy (21–23) have been shown at least temporarily to slow the progression of prehypertension into hypertension. The trials, up until now, have likely been too late to stop the progress, because, at least in the spontaneously hypertensive rat (24), antihypertensive therapy must be given much earlier in the lifespan to prevent the future development of hypertension.

**Conclusions**

Nephrologists have the closest relationship to hypertension than any other specialists. To be even more effective in the early recognition and, hopefully, the prevention of overt hypertension, they need to keep prehypertension in mind.

**Disclosures**

None.

**References**
