



## Pre-hypertension: A New-Old field

Reuven Zimlichman MD

Department of Internal Medicine F, Wolfson Medical Center, Holon, Israel  
Affiliated to Sackler Faculty of Medicine, Tel Aviv University, Ramat Aviv, Israel

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Pre-hypertension is not a new concept; it is an old and rational term that was reintroduced by the Joint National Committee in its seventh report and defined accurately. JNC-7 defines pre-hypertension as blood pressure ranging from 120 to 139 mmHg or diastolic pressure 80–89 mmHg. According to JNC-7, the diagnosis should not be based on one blood pressure measurement but on an average of at least two readings at each of two or more visits. Since it is clear that the risk of hypertension is continuous and has no specific threshold, the higher the blood pressure the higher the risk. Although this definition of pre-hypertension is somewhat artificial, the finite boundaries of the definition clarify for patients at which BP level there is increased risk.

Several large epidemiologic studies have demonstrated the increase in risk in patients with pre-hypertension. The Framingham Heart Study [1] showed an increased hazard ratio in patients with pre-hypertension when compared to patients with optimal blood pressure. A subsequent analysis of data from the same study also showed increased risk in patients with pre-hypertension [2].

Data from the 1999–2000 NHANES study show that the presence of an additional risk factor exaggerated risk excess in patients with pre-hypertension [3]. The study found that the prevalence of pre-hypertension among adults in the United States was about 33% and was significantly higher among men [3]. An association between the degree of microalbuminuria and cardiovascular mortality in patients with pre-hypertension was also reported [4].

Patients diagnosed as suffering from pre-hypertension may revert to the optimal blood pressure range, especially when changes in lifestyle are adopted; they may remain in the pre-hypertensive range and they may become overtly hypertensive. A large study found that male gender, increased waist circumference and family history of hypertension can serve as good predictors of subsequent development of hypertension [5]. In the TROPHY study the rate of progression to hypertension was fast and occurred in about 60% of the patients with pre-hypertension during a 4 year follow-up [6].

In another study performed in adolescents in Israel, 57% of boys and 36% of girls were diagnosed as pre-hypertensive. The presence of obesity was a significant predictor for the diagnosis of hypertension [7].

In the current issue of *IMAJ*, the study by Kitai et al. [8] aimed to determine the prevalence of pre-hypertension in an Israeli adult population by a retrospective review of patients' charts. The most striking finding of the study is that only 40% of the other 346,799 subjects had their blood pressure measured. This finding raises a major question – is the rate of blood pressure measurements really so low in the healthy population or are the presented data inaccurate?

In the electronic patient charts of Leumit Health Services, the field of blood pressure is not mandatory and allows the physician to proceed in entering data in the electronic chart without having to add blood pressure values. It is also possible that in some patients the results of blood pressure measurements were introduced as free text in the follow-up without being taken into consideration by the study researchers. It is important to note that the present study is retrospective and that the blood pressure data represent not a population-based study but a selected group of patients who generally had a particular reason for having their blood pressure measured.

The validity of the diagnosis of pre-hypertension in the present study should also be questioned. According to the guidelines, at least two blood pressure measurements on at least two separate occasions are needed for the diagnosis of pre-hypertension. Without doubt, a single measurement is insufficient. In the present study only one measurement at a single visit was taken.

The presence of isolated systolic hypertension in only 4.5% of the population is also surprising and would be expected to be higher. Since only 41% of the total population in this retrospective study had their blood pressure measured it is very problematic to estimate the prevalence of hypertension in the whole population, since the 41% who had their blood pressure measured were a selected group and possibly had a reason for "being chosen" for blood pressure measurement.

In summary, the main finding of Kitai's study [8] is the surprisingly low prevalence of blood pressure measurement in

JNC = Joint National Committee  
BP = blood pressure

the whole population. Many questions are raised by the study and a few answers are given. Clearly, a large-scale prospective study of the prevalence of hypertension and pre-hypertension in the general Israeli population is justified. Finally, since most physicians use electronic patient charts today, it is important that blood pressure measurements be entered. The files should be created such that the physician cannot proceed to introduce other medical information without first entering the BP measurement. This simple step will avert problems later.

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**Correspondence:** Dr. R. Zimlichman, Head, Dept. of Internal Medicine F, Wolfson Medical Center, Holon 58100, Israel.

Phone: (972-3) 502-8614

Fax: (972-3) 503-2693

email: zimlich@post.tau.ac.il