



Article of Interest

Is Pulse Pressure Useful in Predicting Risk for Coronary Heart Disease? The Framingham Heart Study. Circulation. 1999. (Click to Access)

Context and Study Objective

In a previous issue, we learned that systolic pressure rises and diastolics fall in both hypertensive and normotensive individuals over time. This second paper evaluates the relationship between widening pulse pressure (systolic minus diastolic blood pressure) and the risk of coronary heart disease (CHD).

Main Outcome

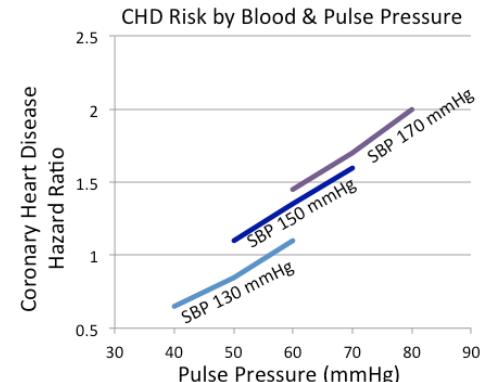
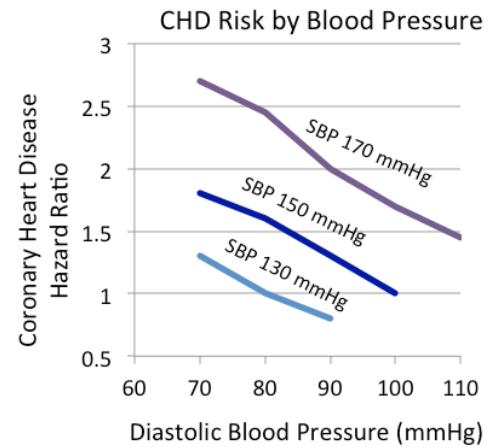
Incidence of coronary heart disease (CHD) by pulse pressure, systolic, and diastolic blood pressure.

Design, Setting, and Participants

Using a population-based cohort from the Framingham Heart Study (initiated 1948), blood pressure (BP) was measured prospectively among normotensive and untreated hypertensives; the incidence of CHD was recorded over a 14 year follow up period. Those with pre-existing CHD were excluded.

Results

- Top Figure: For a given systolic pressure, lower diastolic pressures (i.e. larger pulse pressures) portend a *worse* prognosis than those with normal or elevated diastolic pressures.
- Bottom Figure: The risk of CHD rises linearly with rising pulse pressures.
- Bottom Figure: The risk of CHD for a patient with a systolic BP of 170 mm Hg is not higher than someone with a systolic of 150 mm Hg if the pulse pressures are similar.
- Bottom Figure: A patient with a BP of 150/70 mm Hg (pulse pressure 80 mm Hg) has a *worse* prognosis than an individual with a BP of 170/110 mm Hg (pulse pressure 60 mm Hg)



Clinical Perspective

- Counter-intuitively, systolic hypertension with concomitant diastolic hypertension (low pulse pressure) has a better prognosis than systolic hypertension with "normal" diastolics.
- The physiology is as follows-with aging, elevations in systolic pressure are due to decreased compliance of the large vessels from atherosclerotic disease. This stiffening results in more blood run off into the smaller vessels during systole such that there is less blood volume in the aorta during diastole, hence the lower diastolic pressure.
- Pulse pressure should be considered the "fifth vital" and noted in every patient given its strong association with CHD.