More Evidence of Link Between Healthy Lifestyle and Cardiovascular Health

Forman JP, Stampfer MJ, Curhan GC. Diet and lifestyle risk factors associated with incident hypertension in women. JAMA 2009;302:401–11.

Study Overview

Objective: To assess the association between a combination of dietary and lifestyle factors in young women and the incidence of new-onset hypertension.

Design: Prospective cohort study.

Setting and participants: Data from the Nurses' Health Study II was used to identify 83,822 adult women aged 27 to 44 years who did not have hypertension, cardiovascular disease, diabetes, or cancer in 1991 and who had reported a normal blood pressure. Study participants were followed over a 14-year period (1991–2005) via biennial questionnaires; over 90% were followed through 2005. Six modifiable low-risk diet and lifestyle factors were included: (1) body mass index (BMI) ≤ 25; (2) daily mean vigorous exercise = 30 minutes; (3) a Dietary Approaches to Stop Hypertension (DASH)–style diet, assessed using a food frequency questionnaire; (4) modest alcoholic intake ≤ 10 g/d; (5) use of nonnarcotic analgesics ≤ once per week; and (6) supplemental folic acid intake ≥ 400 µg/d.

Main outcome measures: Adjusted hazard ratios for self-reported hypertension and population attributable risks (PARs).

Main results: 12,319 cases of hypertension were self-reported. The risk of developing hypertension was independently associated with each of the 6 modifiable risk factors. Combinations of specific groups of 3, 4, 5, and 6 risk factors associated with the development of hypertension were analyzed. Women who were in the lowest risk category for each of the 6 modifiable risk factors had a 78% lower risk of developing hypertension (hazard ratio [HR], 0.22 [95% confidence interval, 0.10–0.51]). The hypothetical PAR increased as the number of risk factors increased. The PAR was 53% for 3 risk factors; 58% for 4 risk factors, 72% for 5 risk factors, and 78% for 6 risk factors. A higher BMI had the most powerful affect: a BMI ≥ 25 had an adjusted PAR of 40% compared with a BMI < 25.

Conclusion: This large-scale prospective cohort study suggests that the modification of a combination of low-risk diet and lifestyle factors was strongly associated with considerable reductions in the incidence of hypertension. Successful interventions to modify these risk factors may play a pivotal role in decreasing the prevalence of new-onset hypertension and demonstrate significant public health benefits.

Commentary

Hypertension is among the leading causes of excess deaths among Americans [1]. Although pharmacologic treatments are effective for controlling blood pressure, they have adverse side effects. Further, the lack of long-term adherence to medications leads to significant morbidity and mortality. Finding ways to reduce the likelihood of developing hypertension can have significant benefits for the health of the American population.

Previous studies of diet and lifestyle risk factors have documented the impact of interventions to modify 1 or several lifestyle risk factors associated with the new onset of hypertension. Many studies have shown that lifestyle changes, such as an improved diet, regular exercise, moderate alcohol consumption, the avoidance of non-narcotic analgesics, and the use of folic acid supplements can improve an individual's health. Obesity, which often results from a poor diet and lack of exercise, is particularly important in the development of heart disease, diabetes, and other chronic conditions. However, the impact of obesity and other modifiable risk factors on hypertension is less understood, and no prior efforts have evaluated the proportion of new hypertension cases that may be prevented by modifying a combination of risk factors.

In a large cohort of women health professionals who were followed over 14 years, Forman and colleagues found that the presence of any of the 6 modifiable risk factors was associated with onset of hypertension, with obesity being the single biggest factor. Given the high and rising rates of obesity among the U.S. population, this finding is particularly important. Further, among obese women, none of the other 5 modifiable risk factors seemed to be related to the development of hypertension. This suggests that among this

population, weight loss is surely the single biggest clinical and public health intervention for reducing the risk of developing hypertension, and that weight loss must be addressed to realize benefits from other low-risk behaviors.

There are several important limitations to the study that need to be understood to properly contextualize the findings. First, the women in the cohort are relatively homogeneous: white, well-educated health care professionals. Whether the risk factors identified have the same impact in other groups, such as male, minority, and poor patients, is unclear. Second, the cohort design raises concerns about potential confounders that were missed. It may be that other factors not captured in the analysis, such as substance abuse or stress levels, are related both to the risk factors (ie, obesity) and to the outcome (hypertension), thereby confounding the relationship.

Applications for Clinical Practice

In a large cohort of women without known hypertension, Forman and colleagues found that 6 modifiable risk factors were each independently associated with the development of hypertension and that specific combinations of the 6 factors accounted for much of the population-attributable risks. These findings suggest that for clinicians, focusing on these 6 modifiable risk factors, especially obesity, can substantially reduce the likelihood that patients will develop hypertension. While these findings are not definitive, they provide more impetus to spend time counseling patients to adopt a healthy lifestyle.

—Review by Ashish K. Jha, MD, MPH

References

1. Lowe LP, Greenland P, Ruth KJ, et al. Impact of major cardiovascular disease risk factors, particularly in combination, on 22-year mortality in women and men. Arch Intern Med 1998;158:2007–14.

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