

Significance of Cardiac Risk Factors in the Older Patient

Gary Gerstenblith, Cícero P. de Albuquerque

Baltimore, MD - São Paulo, SP

The importance of evaluating and treating risk factors in older patients is often controversial. In part this is because of the high prevalence of some risk factors, including hypertension and hyperlipidemia, in the elderly and in part because of the belief that if the patient survived to an older age despite the presence of some risk factor, then the substrate must somehow differ so as to render the risk factor less relevant in that individual.

Recent data, however, indicate that many risk factors retain their significance in the older age groups. One of the most important of these is hypertension. In the Third National Health and Nutrition Examination survey, 54% of individuals 65-74 years of age had systolic and/or diastolic pressure elevations. Two thirds had isolated systolic hypertension, a systolic of 160 or greater in the presence of a normal diastolic pressure. Hypertension is associated with increased cardiovascular risk in the elderly and treatment decreases that risk. A meta analysis examining outcomes in over 15,000 older individuals indicates that anti-hypertensive therapy significantly improves overall survival and reduces stroke and cardiac mortality and morbidity.

In diagnosing hypertension in the older patient, the increased likelihood of pseudohypertension, i.e. a falsely elevated pressure due to incompressibility of the brachial artery should be considered. This might be suggested by high readings without evidence of target organ damage. Another clue would be the ability to palpate the artery when the cuff is inflated above the systolic level. A falsely elevated pressure may also be present in older patients with "white coat" hypertension, i.e. those who have elevated readings only in a medical setting. If target organ damage is present, this entity is unlikely to be present. If not, a reading should be obtained in a non-medical setting before instituting therapy.

Another consideration when making the diagnosis of hypertension is the increased likelihood of an orthostatic fall in pressure. Therefore, the pressure should always be assessed in the upright position before instituting or incrementing the anti-hypertensive regimen. The evaluation of the older patient with hypertension can focus on three areas. The first is whether or not there is a reversible cause. In the older individual, it is most likely to be

renovascular disease. Onset at a later age, previously easily controlled hypertension which abruptly takes a more malignant course, the presence of a renal bruit, and/or renal insufficiency may all raise the suspicion of renal artery stenosis on an atherosclerotic basis. If present, the hypertension may be cured with angioplasty or renal artery surgery. A second consideration is the extent of target organ damage. The most sensitive test for renal involvement is microalbuminuria. Cardiac ischemic disease as well as both systolic and diastolic dysfunction are frequently present. The latter may be particularly important in older individuals since some studies estimate that at least 40% of older individuals presenting with heart failure have normal systolic function and that the primary problem is related to a diastolic abnormality. A third consideration is what other risk factors are present. Risk factors commonly associated with hypertension include elevated lipids, truncal obesity, insulin resistance, and left ventricular hypertrophy. These should be searched for and, if present, treated as well.

Therapeutic goals for anti-hypertensive therapy depend, in part, on the initial reading. If the patient has isolated systolic hypertension, the goals of the Systolic Hypertension in the Elderly Program should probably be considered. In this study, treating those over 60 years of age who had systolic pressures over 160 resulted in significant decreases in death or myocardial infarction, stroke, and heart failure. If the systolic pressure was between 160 and 180mmHg, it was reduced by 20mmHg; if the initial systolic was over 180 mm Hg, it was reduced to less than 160mmHg. For those who have diastolic hypertension, the goal is less clear. Although there is general agreement that it should be reduced to under 90mmHg, it is not clear how low the pressure should be. Some studies report a J shaped relationship with an increase in ischemic events for patients with coronary disease if the diastolic is lowered to less than 80mmHg. This may be related to the fact that most of coronary flow occurs in diastole and that flow may be compromised if the pressure is lowered too far in patients with obstructive disease. An additional important consideration is that the pressure should be lowered slowly. Because of age changes in cerebrovascular regulation, cerebral resistance does not decrease as rapidly in older as in younger individuals when pressure is lowered. This may result in compromised cerebral perfusion and ischemic symptoms if the pressure is lowered too quickly. Changes in the anti-hypertensive regimen should be made slowly with small increments in the regimen and with measurements of the upright pres-

sure before deciding to advance the regimen.

There are over two hundred agents which will lower the pressure to normal levels. The goal of anti-hypertensive therapy, however, is not merely to decrease a blood pressure number but, more importantly, to decrease cardiovascular risk. The influence of the anti-hypertensive agent on other cardiovascular risk factors, including left ventricular hypertrophy, should be considered. Regarding specific therapy, it is useful to note that the overwhelming majority of studies demonstrating decreases in cardiovascular mortality used thiazides as the step one anti-hypertensive agent. A recent study indicates that the risk of sudden death in patients on thiazides is not present in those who are also on a potassium sparing agent. Although the anti-hypertensive efficacy of beta blockers is less in older patients, beta blockers should be considered in those with associated ischemic disease since their ability to provide secondary prevention is still effective. Calcium channel blockers can be considered in those with diastolic dysfunction, angiotensin converting enzyme inhibitors in those with systolic dysfunction or diabetes, and alpha blockers in those with prostatic hypertrophy. The increased susceptibility to side effects, age differences in pharmacokinetics and pharmacodynamics, increased likelihood of concomitant disease, compliance issues, and cost all indicate the importance of individualizing anti-hypertensive therapy in the older patient.

Cigarette smoking is also clearly related to cardiovascular outcomes in older individuals. The risk is directly related to the number of cigarettes smoked and stopping smoking, for even three to five years, can decrease cardiovascular risk to that of older individuals who never smoked for their entire lives.

The value of cholesterol screening in older individuals without known coronary artery disease is not certain. Some studies indicate little or no relationship between elevated lipids and cardiovascular outcomes in those over 70 or 75 years of age. A report from the Established Populations for Epidemiologic Studies of the Elderly, however, indicates that HDL cholesterol levels are significant discriminators of coronary mortality and the occurrence of new coronary events in those over 70 years of age, and, in a subset analysis, those over 80 years. Also, data from the 4.5 year follow-up of the participants in the systolic hypertension in the elderly program support the extension of the concept that serum cholesterol levels are important CHD risk factors in older patients, at least in those with isolated systolic hypertension. In that study, total cholesterol, non - HDL cholesterol, LDL cholesterol and the ratios of those three to HDL were significant independent predictors of coronary events

during the follow-up. It is not known whether lowering lipids will lower cardiovascular risk in older individuals without disease. However, the Scandinavian Simvastatin Study indicated that for those with known disease, lipid lowering interventions decrease coronary mortality in those over 60 years of age.

Diabetes is a recognized cardiac risk factor in middle-aged white men, and cardiovascular disease accounts for the majority of deaths and substantial morbidity among diabetic patients. In the SHEP study, including older patients with isolated systolic hypertension, history of diabetes approximately doubled the risk (RR of 2.21) for the development of a non-fatal myocardial infarction or coronary heart disease death during the follow-up, even after adjustment for multiple other risk factors. The importance of good glycemic control is also emphasized by prospective studies from Finland which give evidence for a linear association between glycemic control, as assessed by glycated hemoglobin levels, in elderly patients with non insulin dependent diabetes and the development of coronary heart disease.

Other prevalent risk factors in the older population are obesity and estrogen deficiency. An analysis in over 40,000 older women reported that the relation between waist to hip ratio and cardiovascular outcomes, as well as other causes of death, is strong and monotonic. The waist to hip ratio, but not body mass index, is also the best marker for the metabolic hazards of obesity, including lipid levels and insulin resistance. There are several studies indicating that estrogen replacement therapy is associated with a decrease in the development of cardiovascular disease and cardiovascular mortality in post-menopausal women. Although the benefits of estrogen use are often attributed to a favorable influence on the lipid profile, the Nurses Health Study demonstrated a significant decrease in the development of cardiovascular disease even after adjustment for risk factors, including lipids. Other benefits of estrogen probably include inhibition of endothelial proliferation and attenuation of inappropriate vasoconstriction in post-menopausal women with coronary artery disease. There are also studies indicating a relationship between dietary vitamin E and antioxidant flavonoids intake, as well as plasma fibrinogen and factor seven levels and cardiovascular outcomes in the elderly. It is not known, however, whether altering intake, or changing levels, will alter cardiovascular risk.

In summary, several risk factor reduction strategies are beneficial in older individuals, particularly those with known coronary disease. It is also important to realize that even a modest reduction in relative risk in the older population can translate into a number of avoided events since the absolute risk is so high in this age group.

Bibliography

1. Insua, JT, Sacks HS, Lau TS et al - Drug treatment of hypertension in the elderly: A meta-analysis. *Ann Intern Med* 1994; 121: 355.
2. Scandinavian Simvastatin Survival Study Group - Randomized trial of cholesterol lowering in 4444 patients with coronary heart disease: the Scandinavian Simvastatin Survival Study (4S) *Lancet* 1994; 344: 1383.
3. Corti M-C, Guralnik JM, Saliave ME et al - HDL cholesterol predicts coronary heart disease mortality in older persons. *JAMA* 1995; 274: 539-44.
4. Lacroix AZ, Lang J, Sherr P et al - Smoking and mortality among older men and women in three communities. *N Engl J Med* 1991; 324: 1619-25.
5. Laakso M - Glycemic control and the risk for coronary heart disease in patients with non-insulin-dependent diabetes mellitus. The Finnish studies. *Ann Intern Med* 1996; 124: 127-30.
6. Folsom AR, Kaye SA, Sellers TA et al - Body fat distribution and 5-year risk of death in older women. *JAMA* 1993; 269: 483-7.
7. Stampfer MJ, Colditz GA, Willett WC et al - Postmenopausal estrogen therapy and cardiovascular disease. Ten year follow-up from the Nurses Health Study. *N Engl J Med* 1991; 325: 756-62.
8. Reis SE, Gloth ST, Blumenthal RS et al - Ethinyl estradiol acutely attenuates abnormal coronary vasomotor responses to acetylcholine in postmenopausal women. *Circulation* 1994; 89: 52.
9. Kushi LH, Folsom AR, Prineas RJ, Mink PJ, Wu Y, Bostick RM - Dietary antioxidant vitamins and death from coronary heart disease in postmenopausal women. *N Engl J Med* 1996; 334: 1156-62.
10. Woodhouse PR, Khaw KT, Foley A, Meade TW - Seasonal variations of plasma fibrinogen and factor VII activity in the elderly: winter infections and death from cardiovascular disease. *Lancet* 1994; 343: 435-9.
11. SHEP Cooperative Research Group - Prevention of stroke by antihypertensive drug treatment in older persons with isolated systolic hypertension. *JAMA* 1991; 265: 3255.
12. Burlando AJ, Frost PH, Davis BR et al - Coronary heart disease risk factors in men as women aged 60 years and older: findings from the Systolic Hypertension in the Elderly Program. *Circulation* 1996; 94: 26-34.