

# *Ishemic Heart Disease After 80: The Heartbeat of the Elderly*

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The worldwide elderly population is expanding rapidly with associated health concerns. Globally, the proportion of individuals over 80 currently averages 5%.<sup>1</sup> In the developed world, almost 15% of individuals will be over 80 in 2020, whereby the proportion is expected to increase to 25% by 2050.<sup>1</sup>

Ischemic heart disease, the leading cause of death in the elderly, is associated with high patient morbidity and mortality. Of the conventional risk factors associated with acute coronary syndromes, both hypertension and dyslipidemia lead to premature coronary artery disease. The number of individuals with hypertension is also likely to increase as the population ages. Similarly, epidemiologic data have documented a continuous, graded relationship between the total plasma cholesterol concentration, increasing age, and subsequent risk of an adverse cardiovascular event.

## *Is hyperlipidemia an important risk factor?*

Of the traditional cardiac risk factors, dyslipidemia is one of the leading modifiable factors that can reduce ischemic burden if treated. The 3-hydroxy-3-methylglutaryl coenzyme A (HMG CoA) reductase inhibitors (statins) have become the standard care to treat dyslipidemia. The studies listed in Table 1 have clearly demonstrated the benefit of statin therapy in the middle-aged

Table 1

### **Studies demonstrating benefits of statin therapy**

#### **Primary prevention trials**

- Texas Coronary Prevention Study (TexCAPS)
- West of Scotland Coronary Preventive Study (WOSCOPS)
- Anglo-Scandinavian Cardiac Outcome Trial (ASCOT)

#### **Secondary prevention trials**

- Cholesterol And Recurrent Events (CARE)
- Long-term Intervention with Pravastatin in Ischemic Disease (LIPID)
- Scandinavian Simvastatin Survival Study (4S)
- Heart Protection Study (HPS)

population. These clinical trials, however, have not included a large number of patients over 80.

Unlike the Heart Protection Study (HPS) trial, which included individuals between the ages of 20 and 80, the Prospective Study of Pravastatin in the Elderly at Risk (PROSPER) trial was specifically designed to address the utility of lipid-lowering agents in the elderly. The PROSPER trial randomized 5,804 men and women, aged 70 to 82, with a history of one or more risk factors for vascular disease. Participants were either given pravastatin, 40 mg once daily, or placebo, with a followup of 3.5 years.

Table 2

**Randomized hypertension trials**

<u>Trial</u>	<u>Findings</u>
STOP-Hypertension and STOP-Hypertension 2	Combined antihypertensive therapy reduced fatal or non-fatal stroke by 47%, MI by 40%, and all-cause mortality by 43%.
SHEP study	No decrease in both ischemic and hemorrhagic stroke, but a 50% reduction in the development of congestive heart failure with a diuretic (such as hydrochlorothiazide).
Syst-Eur trial	Demonstrated that treatment with nitrendipine or hydrochlorothiazide reduced chance of stroke by 42%, non-fatal MI by 44%, and sudden death by 28%.

Legend

MI: Myocardial infarction

STOP: Swedish Trial in Old Patients

SHEP: Systolic Hypertension in the Elderly Program

Syst-Eur: Systolic hypertension in Europe

The mean age of patients was 75.3. The main finding was that treatment with pravastatin was associated with a 15% reduction in the composite end point of cardiovascular death, myocardial infarction (MI), or stroke.<sup>2</sup> This is equivalent to a 2.1% absolute risk reduction. The practical clinical

finding from PROSPER was that 48 individuals had to be treated for 3.5 years to prevent one primary end point.<sup>2</sup>

*What role does hypertension play?*

The role of hypertension as a risk modulating factor for ischemic heart disease, as well as the benefits of antihypertensive therapy, are well-established in older patients up to the age of 80. However, for the cohort of individuals over 80, the data is scarce.

With increasing age, large atherosclerotic vessels become less compliant. This lessening compliance results in an increase in systolic blood pressure (BP), with a small decrease in the diastolic BP

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Table 3

### Markers of frailty in the elderly

- Degree of functional dependence
- Extent of cognitive impairment
- Number of comorbid conditions
- Impaired physical performance
- Amount of social support
- Poor self-rated health
- Added cardiovascular risk factors

### Take-home message

- Dyslipidemia and hypertension can reduce ischemic burden if treated properly.
- Determining expected lifespan of an individual rests on the general markers of frailty in the elderly, such as degree of functional dependence and impaired physical performance.
- If a patient can live with a good quality of life for two to three years, then treatment with an antihypertensive agent and a lipid-lowering agent may be appropriate.

component. Therefore, the emerging clinical challenge in the aging population is to identify and treat isolated systolic hypertension.

In today's world of randomized megatrials, the evidence of antihypertensive therapy in patients over 80 is still limited. In four randomized trials (Table 2), the benefits of antihypertensive treatment in the elderly, for both hypertension or isolated systolic hypertension, are paramount in reducing coronary and cerebrovascular morbidity and mortality.<sup>3-6</sup>

Based on only these four randomized controlled trials, low doses of thiazide diuretics or long-acting

nondihydropyridine calcium channel blockers should be used in patients over 80 with systolic hypertension.

### *Does comorbidity/frailty predict quality of life?*

Along with the paucity of evidence-based trials on the utility of lipid-lowering and antihypertensive therapy in the elderly, one must consider the expected lifespan and the frailty issue in predicting remaining quality years of life. The average 80-year-old male is expected to live for seven years, and the female for nine years, but only if otherwise healthy and independent (Table 3).<sup>7</sup>

In the only lipid-lowering trial in the elderly, PROSPER, an expected benefit took from six months to two years to occur. In the four hypertension trials listed in Table 2, drug therapy took an average of two years. Thus, if a patient can be expected to live a good quality of life for at least two to three years without any adverse markers, then treatment is warranted. The markers of frailty in Table 3 are additive; that is, the quality of the remaining years of life is a function of the number of markers that are present.

### *What will happen in the future?*

As disease therapies continue to improve, it is likely that clinicians will spend a large portion of their time treating cardiovascular diseases in increasingly old and frail patients. By 2020, the World Health Organization expects coronary artery disease to be a greater burden on the national health-care systems of the world than any other single disease.<sup>1</sup> The modification of risk factors, such as hypertension and

dyslipidemia, will be paramount in decreasing the impact of ischemic heart disease on the elderly. However, the issues of economic burden of medications, as well as the frailty issue, need to be taken into account.

If a patient past 80 can be expected to live with a good quality of life for at least two to three years, then treatment with an antihypertensive agent and a lipid-lowering agent may be appropriate.

If one decides to treat, treat to target, but start low and go slow.



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