Left Ventricular Hypertrophy
Prevalence in Older Patients and Management

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Summary

Left ventricular hypertrophy (LVH) can be detected by electrocardiography or, with greater sensitivity, by echocardiography. Its prevalence increases with age, probably due to greater disease diffusion rather than aging itself. LVH is not only a consequence of disease, but also an independent contributor to morbidity and mortality, both in young and aged populations. Attempts have been made to reduce left ventricular (LV) mass by pharmacological and other means. LVH regression is possible in young and old hypertensive patients by some but not all hypotensive drugs. The effect on LV mass seems largely independent of blood pressure reduction. Whether LV mass control should be sought beyond the treatment of the underlying disease is still debated. Preliminary data indicate prognostic benefits associated with LVH regression, but studies on the elderly are scanty.

LVH is a common and ominous finding in old people. In hypertension it can be reversed by drug therapy, with apparent functional improvement. Further studies are needed to verify the long term consequences of LV mass reduction in this age group.

Left ventricular hypertrophy (LVH) is the abnormal increase in left ventricular (LV) mass. Its detection becomes more common with advancing age.\[1\] In the past, LVH in the elderly was considered an aspect of the physiological aging process,\[2\] but this has been disputed by more recent observations.\[3-5\] The identification of its negative prognostic effects\[6\] has prompted researchers to verify the possibility and potential benefits of treatment and prevention of this condition. This review paper deals with epidemiological, pathophysiological and clinical aspects of LVH, focusing on hypertensive LVH, its more common form, with special reference to their implications for the elderly population.

This review is based mainly on studies publish-
ed in English between 1986 and early 1994 and cited in MEDLINE. We used the search terms hypertrophy, left ventricular and heart hypertrophy in conjunction with terms indicating advanced age (elderly, old, older, etc.).

1. Epidemiology

Recent data from the Framingham Study on the prevalence of echocardiographic LVH in the general population indicate an occurrence rate of 14.2% in men and 17.6% in women. These figures are considerably greater than those previously found by electrocardiography (ECG), given its inferior sensitivity (see section 3).

The main factors independently associated with LVH or with an increase in LV mass include advanced age, male gender, hypertension, especially systolic, obesity and valvular and ischaemic heart disease. Other factors associated with LVH are Black race, exercise training, particularly if accompanied by blood pressure elevation, dietary sodium intake and alcohol (ethanol) consumption. Thus, there are individuals who have a higher risk of LVH compared with the general population: for instance, patients with mild and uncomplicated hypertension have a prevalence of LVH of approximately 30%.

Elderly patients are also at high risk. Data from the Framingham Study indicate a prevalence of echocardiographic LVH in 33% of males and 49% of females over 70 years of age, similar to the 35% found in patients in a long term healthcare facility. Figures are even higher among the elderly with diseases which predispose to the development of LVH, such as hypertension and valvular disease. In a group of aged individuals, Aronow and colleagues detected echocardiographic LVH in 74 to 100% of patients with aortic stenosis, with prevalence increasing in proportion to the severity of the valve defect, and in 39% of White and 60% of Black patients with hypertension.

Large trials on aged populations, like the Cardiovascular Health Study, the Helsinki Ageing Study and the European Working Party on High Blood Pressure in the Elderly (EWPHE) Trial, have confirmed the correlation between blood pressure, especially systolic, and LV mass. In the elderly, even mild forms of hypertension are associated with an increase in LV mass as compared with age-matched normotensive individuals: this association is valid even for borderline isolated systolic hypertension, which is very common within the community-dwelling aged population, and white coat hypertension.

In the oldest segment of the elderly population the prevalence of LVH is particularly high: overt LVH and thickening of the left ventricular wall have been detected in more than half the patients over 90 years of age with definite or suspected heart disease. In the light of these data, it is important to establish whether the susceptibility to LVH in the elderly is inherent in the physiological aging process, or whether it derives from pathophysiological conditions common, but not inextricably bound, to advanced age.

Some epidemiological data suggest the second hypothesis. In the Framingham Study, the increase in LV mass with age, observed in the general population, disappeared in a ‘healthy’ subgroup. Among these individuals without clinical signs of coronary disease, hypertension or obesity, age was no longer a predictor of LV mass. Similarly, Aronow and colleagues found LVH in 42% of elderly patients with heart disease or hypertension, but only in 2% of those who were free of both conditions.

The results of echocardiographic and autopsic studies conducted on individuals carefully screened to exclude hypertension, heart and valve disease, did not show a relationship between age and cardiac mass. Changes in ventricular geometry, with a trend to wall thickening, are a common finding in healthy aging. In the past, these changes were believed to indicate LVH, but they do not necessarily imply a significant increase in mass. It is probable, therefore, that the frequent occurrence of LVH in older adults arises from the high prevalence of cardiovascular disease, particularly hypertension. In the light of its high occurrence and poor prognosis (see section 4), the poten-