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Nebivolol in Hypertension and Chronic Heart Failure

A Viewpoint by Alberto Zanchetti

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Hypertension is a major risk factor for cardiovascular disease, and this risk increases when other risk factors or diseases, such as diabetes mellitus, dyslipidaemia and obesity, are associated with hypertension. Reduction of high blood pressure significantly improves cardiovascular outcome and, in particular, decreases the incidence of stroke and coronary events.

Hypertension is also known to impair left ventricular systolic and diastolic function, mostly through the development of left ventricular hypertrophy and stiffening of the ventricular walls. Largely through these mechanisms, hypertension is an important precursor of heart failure, and a considerable proportion of the cardiac deaths and hospitalisations increasingly occurring in the elderly have hypertension as the most significant antecedent.

A number of experimental and clinical investigations have shown an association between hypertension and endothelial dysfunction, with an impairment of the endothelial L-arginine/nitric oxide pathway. In hypertensive patients, the basal and stimulated production of nitric oxide is reduced and the normal balance between vasodilating and vasoconstricting factors is modified. This results in a decrease in vasodilation, an increase in vasoconstriction and a reduction of the protective role nitric oxide plays on arterial walls.

Drugs that reduce blood pressure and simultaneously improve or reverse endothelial dysfunction may have some advantages in terms of cardiovascular protection. As summarised in the review by Moen and Wagstaff,[1] nebivolol has been shown to combine high β_1-receptor affinity and nitric oxide-mediated vasodilation, providing a unique haemodynamic profile associated with a marked antihypertensive effect and high tolerability.

β-Adrenoceptor antagonists, although long established for the treatment of arterial hypertension, have recently raised concerns mostly because of adverse metabolic effects, such as insulin resistance and a diabetogenic action, that may be due, at least in part, to their vasoconstricting effect. Hence the interest in β-adrenoceptor antagonists with additional vasodilating activity, especially when vasodilation results from correction of an associated disturbance such as endothelial dysfunction. Of course, this deserves to be further investigated by comparative studies.

In the meantime, it is of clinical importance that a recent randomised trial, SENIORS (Study of the Effects of Nebivolol Intervention on Outcomes and Rehospitalisation in Seniors with Heart Failure)[2] has shown that nebivolol can reduce the composite endpoint of mortality and cardiovascular hospitalisation in elderly patients with chronic heart failure. Heart failure is not only a frequent ominous complication of hypertension, but also one complication against which not all antihypertensive agents are equally effective. ▲

References

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