Reconsideration of Beta-blocker Therapy in Patients with Peripheral Artery Disease

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Beta-adrenergic blocking drugs (beta-blocker) are widely used medications for hypertension, arrhythmia, coronary artery disease and heart failure. The use of beta-blockers in patients with peripheral artery disease (PAD) remains controversial, as these agents decrease the cardiac output and upregulate the alpha adrenergic drive, and the presumed peripheral hemodynamic consequences may lead to worsening symptoms of intermittent claudication. In addition to bypass surgery, endovascular therapy relieves intermittent claudication and/or critical limb ischemia (CLI) in patients with PAD and is now firmly established based on novel technical developments and recent improvements in devices. Therefore, the use of beta-blockers should be reconsidered in the new era of endovascular intervention.

Soga, et al. conducted a multicenter retrospective study to examine the effects of beta-blockers on the clinical outcomes in 1,873 consecutive patients (2,255 limbs) with CLI who underwent primary endovascular therapy, with a mean follow-up of 22 months. As a result, there were no significant differences in the amputation-free survival, limb salvage, overall survival or freedom from major adverse limb event rates between the 394 beta-blocker treated patients and the 1,479 non-beta-blocker treated patients. Although this study was a retrospective study, for the first time in Japan, the authors clarified that the use of beta-blockers did not worsen the clinical outcomes after endovascular therapy in a large-scale population of patients with CLI. However, the overall effect of beta-blockers on claudication and the maximal walking distance was not determined in this study. Therefore, the effect of beta-blockers on the clinical outcomes, including the claudication and the walking distance, should be evaluated in further prospective studies of CLI patients treated with endovascular therapy or bypass surgery.

A meta-analysis of six randomized controlled trials demonstrated that beta-blockers, such as atenolol, propranolol, pindolol and metoprolol, do not worsen the walking distance or outcomes in PAD patients with intermittent claudication. The updated guidelines for the management of patients with PAD state that beta-blockers are effective antihypertensive agents and not contraindicated in patients with PAD (Class I, Level of Evidence: A). Therefore, beta-blockers can be used with caution in PAD patients with hypertension, arrhythmia, coronary artery disease and heart failure after endovascular therapy. Aggressive cardiovascular risk factor reduction is a key component of postprocedural care to prevent cardiovascular events and improve the prognosis in PAD patients with concomitant diseases, such as coronary artery disease, stroke and heart failure. The number of high-risk patients with PAD is increasing, and physicians should not hesitate to use beta-blockers in PAD patients, if necessary. Be forewarned, however, that beta-blockers may decrease the peripheral blood flow in patients with CLI before endovascular therapy.

Beta-blocker drugs have several characteristic differences, including their intrinsic sympathomimetic activity, alpha-adrenergic blocking activity, lipid solubility and beta 1-selectivity, and these differences may influence the effects of beta-blockers on the symptoms and outcomes of PAD patients. Therefore, differences in beta-blockers, including the dosage, should be examined in further prospective studies.

Conflicts of Interest

None.
References


