THE ROLE OF ROSUVASTATIN AND EZETIMIBE IN REDUCING MYOCARDIAL INFARCTION RISK

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ABSTRACT

Atherosclerosis remains a leading cause of ischemic heart disease (IHD) and subsequent heart failure (HF). The progression of atherosclerosis involves lipid accumulation, endothelial dysfunction, and chronic vascular inflammation, leading to plaque formation and vascular stenosis. In young and middle-aged adults, dyslipidemia and subclinical vascular changes have become increasingly common due to sedentary lifestyles, dietary habits, and metabolic disorders.

Statins—particularly rosuvastatin—and cholesterol absorption inhibitors such as ezetimibe have shown significant efficacy in lipid control and atherosclerotic plaque stabilization. Their combined use may reduce the risk of myocardial infarction (MI) and improve vascular function, particularly in patients with residual risk despite statin monotherapy.

Introduction

Atherosclerosis remains a leading cause of ischemic heart disease (IHD) and subsequent heart failure (HF). The progression of atherosclerosis involves lipid accumulation, endothelial dysfunction, and chronic vascular inflammation, leading to plaque formation and vascular stenosis. In young and middle-aged adults, dyslipidemia and subclinical vascular changes have become increasingly common due to sedentary lifestyles, dietary habits, and metabolic disorders.

Statins—particularly rosuvastatin—and cholesterol absorption inhibitors such as ezetimibe have shown significant efficacy in lipid control and atherosclerotic plaque stabilization. Their combined use may reduce the risk of myocardial infarction (MI) and improve vascular function, particularly in patients with residual risk despite statin monotherapy.

Materials and Methods

A total of 48 patients (27 men and 21 women, aged 25–55 years) diagnosed with atherosclerosis and ischemic heart disease were observed. All participants underwent clinical evaluation, biochemical analysis, and instrumental studies including: lipid profile: total cholesterol (TC), LDL-C, HDL-C, triglycerides (TG), and atherogenic index. coagulation profile: prothrombin time (PT), activated partial thromboplastin time (aPTT), fibrinogen, and D-dimer. Inflammatory markers: high-sensitivity C-reactive protein (hs-CRP), ESR, and interleukin-6 (IL-6). Doppler ultrasonography of carotid arteries for intima-media thickness

(IMT) and plaque evaluation. Echocardiography: left ventricular ejection fraction (LVEF), diastolic function, and wall motion abnormalities.

Patients were divided into two groups: group I (n=24): standard therapy with rosuvastatin (20 mg/day). Group II (n=24): combined therapy with rosuvastatin (10 mg/day) and ezetimibe (10 mg/day). The treatment period lasted 12 weeks.

Results

At baseline, mean TC was 6.5 ± 0.7 mmol/L, LDL-C 4.2 ± 0.6 mmol/L, HDL-C 1.1 ± 0.2 mmol/L, and TG 2.0 ± 0.4 mmol/L. Elevated fibrinogen levels (4.4 ± 0.6 g/L) and increased hs-CRP (3.9 ± 1.2 mg/L) indicated a chronic inflammatory state.

Carotid IMT averaged 1.0 ± 0.2 mm, with atherosclerotic plaques found in 46% of patients. After 12 weeks of therapy: group I (rosuvastatin): LDL-C decreased by 48%, TC by 35%, hs-CRP by 20%, and fibrinogen by 10%. Group II (rosuvastatin + ezetimibe): LDL-C decreased by 63%, TC by 45%, hs-CRP by 32%, and fibrinogen by 18%. Doppler studies showed mild regression of IMT (to 0.85 ± 0.15 mm) and improved carotid blood flow in 41% of Group II patients. Echocardiography demonstrated improved diastolic filling and a slight increase in LVEF (from 54% to 58%) in both groups, more pronounced in combined therapy.

Discussion

The study confirms that the addition of ezetimibe to statin therapy significantly enhances lipid-lowering and anti-inflammatory effects, improving vascular function and reducing prothrombotic tendencies. Rosuvastatin, with its high potency and pleiotropic benefits, remains a cornerstone in the management of dyslipidemia and prevention of ischemic complications. The reduction of inflammatory and coagulative parameters highlights the interplay between lipid metabolism, inflammation, and endothelial health in the pathogenesis of atherosclerosis and IHD. These effects collectively contribute to a lower risk of myocardial infarction and progression toward heart failure.

Conclusion

Combined lipid-lowering therapy with rosuvastatin and ezetimibe effectively improves lipid and inflammatory profiles, reduces carotid IMT, and enhances cardiac function. Early detection of dyslipidemia, hypercoagulability, and subclinical atherosclerosis using Doppler ultrasonography and biochemical screening is essential for primary prevention of myocardial infarction and heart failure in at-risk populations.

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