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V619 - Comparison of organic nitrates on circulating endothelial progenitor cells and endothelial function in patients with symptomatic coronary artery disease

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Symptomatic coronary artery disease (CAD) is usually treated with organic nitrates. Endothelial progenitor cells (EPC) are a circulating cell population participating in angiogenesis and vascular homeostasis in a nitric-oxide (NO)-dependent manner. We thus investigated the effects of the NO donors isosorbide dinitrate (ISDN) and pentaerythritol tetranitrate (PETN) on numbers and function of EPC and endothelial function in patients with symptomatic CAD.

We randomized 36 patients with angiographically proven CAD to treatment with either ISDN (40mg retarded release orally two times per day; n=18) or PETN (80mg orally two times per day; n=18) for fourteen days. Baseline characteristics were similar in both groups. PETN treatment substantially increased numbers of circulating $CD34^+/KDR^+$ EPCs (*P*=0.02), whereas no effects were observed in patients treated with ISDN. EPC function assessed by formation of endothelial colonies was enhanced by 2-fold (*P*=0.04) in patients treated with PETN. In contrast, no changes were observed after ISDN treatment. Migratory capacity of EPC was unchanged in both treatment groups. Endothelial function, assessed by peripheral arterial tonometry, remained unchanged during PETN treatment, but was significantly impaired in patients treated with ISDN.

In conclusion, treatment of symptomatic CAD patients with PETN for fourteen days significantly increased levels of circulating EPC and improved markers for EPC function, whereas ISDN was without effects on EPCs and worsened endothelial function.

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