measured resting MBF with positron emission tomography using either O-15 water or N-13 ammonia and the myocardial response to Dob (2.5 to 40 μg/kg/min) with transesophageal echocardiography in 15 patients (14 men; age 61 ± 9 years) with resting ejection fraction < 45% (mean: 30 ± 10). Systolic wall thickening (SWT) and MBF were measured quantitatively in 8 anatomically matched myocardial segments in each patient. A total of 115 segments were available for analysis. SWT at rest ranged from -11% to 71% (mean ± SD: 24 ± 18%) and MBF from 0.17 to 1.7 ml/g/min (normal: ≥ 0.8). Segments with normal MBF had significantly greater contraction at rest compared to those with reduced MBF (SWT: 29.4 ± 19% vs. 14.8 ± 18%; P < 0.0001).

Furthermore, the inotropic response to Dob was also significantly greater in regions with preserved MBF (increase in percent SWT > 20%) compared to abnormal segments with low MBF (51 of 72 (71%) vs. 14 of 43 (33%); P = 0.0001). Thus, both resting myocardial contraction and the inotropic response to Dob are related to MBF. These findings suggest that reduced coronary blood flow is a determinant of myocardial contractility reserve in patients with CAD and LV systolic dysfunction.

**Effect of Low-Density-Lipoprotein Apheresis on Coronary Anatomy and Regional Myocardial Blood Flow**

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In patients with coronary artery disease (CAD) and hypercholesterolemia progression of the disease is connected with wall thickening. LDL-Apheresis over dextran sulphate columns is a very effective lipid-lowering therapy which might have an important effect on coronary anatomy and physiology.

**Methods:** In a randomized study we compared the effect of biweekly LDL-apheresis and simvastatin versus simvastatin alone. Patients with total cholesterol ≥ 8 mmol/l and severe CAD were included in the study, 21 in the LDL-apheresis (L) group and 21 in the medication (M) group. Mean segment diameter (MSD) and minimal obstruction diameter (MOD) were assessed by QCA before and after 2 years of therapy. The regional myocardial blood flow was assessed by digital subtraction angiography after i.e. papaverin with video densitometric calculation of the hyperemic mean transit time (HMTT).

**Results:** LDL-cholesterol decreased from 7.72 ± 1.96 mmol/l to a time averaged level of 2.95 ± 1.13 (63%) in the L group and from 7.85 ± 2.34 mmol/l to 4.13 ± 1.58 mmol/l (-43%) in the M group. QCA revealed no differences in coronary anatomy either on a patient based or on a segment based comparison. Paired HMTT measurements were assessed in 43 regions in the L group and 35 regions in the M group. Baseline values for MOD and MSD were not significantly different. In the L group HMTT decreased over 2 years in all regions from 3.35 ± 1.18 to 2.87 ± 0.82 s/100 cm (< 0.01) versus an increase in the M group from 2.95 ± 1.06 to 2.95 ± 0.90 s/100 cm (NS). The HMTTs of the LAD, RCA and CCA region contributed to the same extent in the final result.

Conclusions: LDL-apheresis compared to simvastatin alone lowered LDL-cholesterol significantly more. Both groups showed no change in coronary anatomy. However, regional myocardial blood flow improved in the L group. This functional enhancement is in accordance with previous reported results of exercise tests and may be a marker of recovery of endothelial function.

**Recovery of Function After Revascularization Is Dependent on Preservation of Myocardial Blood Flow**

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The utility of myocardial blood flow (MBF) for the evaluation of recovery of function after revascularization (rev) has not been well studied. In this study, we determined whether MBF differentiates asynergic regions that improve post-rev (viable) from those that remain abnormal post-rev (nonviable). We determined whether MBF differentiates asynergic regions that improve post-rev (viable) from those that remain abnormal post-rev (nonviable). We performed 99mTc-sestamibi SPECT and subsequent FDG-PET at rest and 1 hour after dobutamine at baseline and post-rev. We measured MBF (ml/g/min) and extent of abnormality (ES) before and after rev. MBF increased, ES decreased, and SWT improved after rev in viable but not in nonviable regions. We found a positive correlation between MBF at baseline and SWT post-rev in viable but not in nonviable regions. This suggests that preservation of MBF is a determinant of myocardial contractility reserve in patients with CAD and LV systolic dysfunction.