THE EFFECT OF HIGH DOSE STATINS ON VASCULAR WALL DAMAGE AND CARDIOVASCULAR RISK IN AORTIC COARCTATION

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Background: Patients after coarctation repair (CoA) demonstrate an increased cardiovascular risk. Carotid intima-media thickness (CIMT) a reliable marker for atherosclerosis is increased in (CoA). HMG-coA-reductase-inhibitors (statins) have been proven to reduce CIMT and clinical events. The aim of our study was to evaluate the effect of statins on the vascular wall in CoA.

Methods: We designed a multicentre, prospective, randomised, open label trial with blind endpoint (PROBE design) to evaluate the effect of Atorvastatin 80 mg once daily on CIMT progression during 3 year follow-up. The primary endpoint in this study was CIMT measured by B mode ultrasonography. Secondary endpoints were mortality and morbidity due to cardiovascular disease, serum lipids and 24h ambulatory blood pressures.

Results: A total of 130 patients were enrolled (Atorvastatin = 66, No treatment = 64), of which 42 (64%) were on antihypertensive therapy in the statin group versus 42 (65%) in the group without treatment (P = 0.49). There was no significant effect of statin treatment on CIMT progression (treatment effect -0.005, 95%CI, -0.039 - 0.029; P = 0.76). In neither groups significant CIMT progression was found. Baseline CIMT was significantly higher in hypertensive as compared to normotensive CoA(0.61±0.98 mm vs 0.69± 0.16; P= 0.002). Regression analysis revealed that hypertension (ß = 0.004, P = < 0.001) was the strongest predictor for CIMT progression besides age (ß = 0.043, P = 0.031) and cholesterol (ß = 0.040, P = 0.027). A significant effect of statins on serum total cholesterol levels and serum LDL levels was found. (-0.71, 95% CI, -1.16 - -0.26; P = 0.002 vs -0.66 -1.06 - -0.26; P = 0.001). There was no difference in the remaining secondary outcome measures.

Conclusion: Hypertension is the strongest predictor for CIMT progression in CoA. Treatment with statins does not reduce CIMT progression and secondary outcome measures, despite a decrease in serum total cholesterol and LDL. These findings suggest that the damaging effect of hypertension predominates the effect of statin therapy on the vascular wall. Future trials with anti-hypertensive agents are needed to evaluate the beneficial effect on the vascular wall in CoA.