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Subclinical atherosclerosis in cyanotic congenital heart disease

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Introduction

The survival of patients with cyanotic congenital heart disease (CCHD) has improved dramatically due to better care and treatment options, which has resulted in an ageing population with risk of acquired heart disease. Previously uncontrolled studies have suggested that these patients are protected against the development of atherosclerosis.

The aim of the present study was to evaluate the prevalence of subclinical atherosclerosis in patients with CCHD and a matched control population.

Method

The prevalence of atherosclerosis was investigated in adults with CCHD and in controls matched for age, sex, body-mass-index, and smoking status. The patients were included from centers in Denmark, Norway, Sweden and Australia. Coronary artery atherosclerosis was assessed by computer tomography with measurement of coronary artery calcification (CAC) score with subclinical atherosclerosis defined as a CAC >0. Carotid artery atherosclerosis was evaluated using ultrasound by measuring plaque burden and carotid intima media thickness (CIMT). Lipid status was evaluated as additional atherosclerotic risk factor.

Results

Data on 63 patients with CCHD (mean age 48.5 years (± 12.7) and 59 matched controls 48.6 years (± 13.0) showed no difference in CAC score (CAC >0: 21% of patients vs. 17% of controls (CI; -10%; 18%, $p=0.57$). Similar, no differences were found in the present of carotid plaque burden (23% in patients vs. 12% in controls, $p=0.11$), CIMT (0.62 mm (± 0.13) in patients vs. 0.61mm (± 0.14) in controls, $p=0.48$). Lipid status on ultracentrifugation did not differ between the groups (total cholesterol: 4.76 mmol/l (± 0.97) in patients vs. 5.14 mmol/l (± 0.95) in controls, $p=0.08$; low-density-cholesterol: 2.59 mmol/l (± 0.64) in patients vs. 2.85 mmol/l (± 0.84) in controls, $p=0.11$).

Conclusion

In this controlled study we did not find an increased burden of subclinical atherosclerosis in patients with CCHD by combining a variety of assessment methods.

We could not confirm the results of previous studies, which by analysing smaller samples have indicated a decreased risk. Thus, the present study indicates that patients with CCHD should apply to the same prophylaxis precautions including life-style modifications as recommended for the general population in order to avoid atherosclerotic diseases.