EXPRESSION OF CARDIOLIPIN BIOSYNTHESIS AND REMODELING ENZYMES IN ADULT HEART FAILURE

Poster Contributions
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Background: Cardiolipin (CL) is a unique phospholipid that is an essential component of the inner-mitochondrial membrane critical for normal energy metabolism. Biosynthesis of CL occurs via an enzymatic pathway or through remodeling of existing CLs. The content of total CL and (18:2) 4CL (tetralinoleic form, normally predominant in the heart) are lower in ventricular tissue from adults with heart failure secondary to idiopathic dilated cardiomyopathy (IDC).

Purpose: The aim of this study was to determine the expression levels of CL biosynthetic and remodeling enzymes associated with CL content changes in IDC.

Methods: mRNA was isolated from the left ventricle (LV) of adult IDC patients at transplant (n= 27; mean age = 51+14) and non-failing control LV from donor hearts (n= 15, mean age = 43+8). RT-PCR was used to measure expression of CL biosynthesis and remodeling enzymes.

Results: Expression of biosynthetic enzymes, CDP diacylglycerol synthase 2 and phosphatidylglycerolphosphate synthase, were both 33% lower in IDC LV (p<0.05). Remodeling enzymes, monolyso-CL acyltransferase and tafazzin, were also down-regulated (66% and 43% respectively, p<0.01) in IDC LV compared to controls.

Conclusions: These results demonstrate that biosynthetic and remodeling CL abnormalities are present in failing IDC hearts and may contribute to mitochondrial CL abnormalities in heart failure. Supported by NIH/NCATS Colorado CTSI Grant Number UL1 TR000154.