Rhizomelic chondrodysplasia punctata and cardiac pathology


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Introduction:
Rhizomelic Chondrodysplasia Punctata (RCDP) is an autosomal recessive peroxisomal disorder characterized by rhizomelia, contractures, congenital cataracts, facial dysmorphia, severe psychomotor defects and growth retardation. Biochemically, the levels of plasmalogens (major constituents of cellular membranes) are low in erythrocytes due to a genetic defect in their biosynthesis. Cardiac muscle contains high concentrations of plasmalogens. Recently cardiac dysfunction was found in a mouse model for RCDP with undetectable plasmalogens levels in all tissues including the heart. This suggests the importance of plasmalogens in normal cardiac development and function. Congenital heart disease (CHD), however, has not been recognized as a major characteristic of RCDP.

Objectives:
We aimed to determine the prevalence of CHD found in RCDP patients as well as to describe genetic, biochemical and cardiac correlations.

Methods:
We included 23 patients with genetically proven RCDP. The genetic, biochemical and physical data were evaluated. Electrocardiograms and echocardiograms were reviewed.

Results:
Cardiac data were available for eighteen patients. Twelve (52%) had CHD. All 12 had type 1 RCDP and 11 (92%) had the PEX 7:c.[875T>A] mutation, of whom 7 homozygous (58%). Plasmalogen levels were significantly lower in the patients with CHD. Cardiac lesions included: septal defects (80% atrial), patent ductus arteriosus, pulmonary artery hypoplasia, Tetrology of Fallot and mitral valve prolapse (mostly older patients).

Conclusion:
The CHD prevalence among RCDP patients was at least 52%, significantly higher than among the normal population. Plasmalogen levels were significantly lower in patients with CHD. Routine cardiac evaluation should be included in the clinical management of RCDP patients.