

**Carvajal/Naxos syndrome secondary to Desmoplakin-dominant mutation is associated with hypo/oligodontia**

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**Introduction:**

There is evidence that Carvajal syndrome (wooly hair, palmoplantar keratoderma and dilated cardiomyopathy) and Naxos syndrome (same hair and skin anomalies with fibrofatty cardiomyocytes replacement in the right ventricle) are variable expressions of the same syndrome secondary to mutations in genes encoding proteins of the desmosome. We report here additional signs that might be helpful to cardiac pediatricians to establish the diagnosis.

**Report:**

This is a familial case. The proband had 3 episodes of chest pain with transient ST elevation in leads V3-V4 and mild rise of troponin blood concentration. As he was 15 years old, he had left ventricular enlargement (LV diameter 64 mm) with normokinetics (EF 59%) and no coronary anomalies. He had good adaptation to physical activity but numerous premature beats disappearing during physical stress. He had palmoplantar keratoderma, woolly hair and was missing several molars.

A younger brother had 2 fainting episodes as he was 17. He had incomplete RBBB and dilated left ventricle (60 mm diameter at end-diastole) with normokinetics. Four years later, he had shortness of breath with LV at 70 mm and EF at 20%. He had numerous ventricular premature beats and runs of ventricular tachycardia. He received a heart graft. His heart had enlarged ventricles with fibrofatty replacement in anterior and posterior walls of the right ventricle. He had palmoplantar keratoderma, woolly hair and marked oligodontia with only 4 permanent molars and several persisting primary teeth. The father who experienced several fainting spells had also a dilated cardiomyopathy with the same skin, hair and teeth anomalies.

The desmoplakin (DSP) and plakoglobin (JUP) genes were screened for mutation and a single heterozygous mutation was found in the DSP gene: c.1790C>T, p.Ser597Leu. This residue is conserved across vertebrates. This variant was absent from 100 controls. The mutation was found in the 2 brothers, their father but absent from other family members including the 2 paternal grandparents.

**Conclusion:**

Heterozygous missense mutation in the DSP gene may result in chest pain, fainting episodes, dilated cardiomyopathy in teenagers. The association of woolly hair, palmoplantar keratoderma and/or oligodontia may help in establishing the diagnosis of Carvajal/Naxos disease.