Renal-Hepatic-Pancreatic Dysplasia 1

Alternative Names
RHPD1
RHPD
Ivemark II syndrome
Renohepaticopancreatic dysplasia

Record Category
Disease phenotype

WHO-ICD
Congenital malformations, deformations and chromosomal abnormalities > Congenital malformations of the urinary system

Incidence per 100,000 Live Births
Unknown

OMIM Number
208540

Mode of Inheritance
Autosomal recessive

Gene Map Locus
3q22.1

Description
RHPD1 is a multisystem disorder characterized by abnormalities in the kidneys, liver, pancreas, heart, lungs, spleen and central nervous system. Cardiac anomalies include aortic stenosis and atrial septal defects while CNS deformities involve Dandy-Walker malformation and cerebral cysts. Renal defects include kidney cysts, dysplasia, deficient nephron differentiation and eventually renal failure. Patients also suffer from hepatic cysts, hepatic fibrosis, cirrhosis, pancreatic cysts and fibrosis, asplenia or polysplenia, lung hypoplasia and Potter facies. The prognosis of RHPD1 is poor with most patients succumb to the disorder in the perinatal period. While the prevalence of RHPD is not yet clear, it does not appear to have a gender or ethnic bias.

Diagnosis is based on clinical features and can be confirmed by genetic analysis. There is currently no cure for the disorder; treatment is symptomatic and follows a multi-disciplinary approach.

Molecular Genetics
RHPD1 follows an autosomal recessive pattern of inheritance and it is caused by mutations in the NPHP3 gene. This gene encodes a protein involved in the negative regulation of canonical Wnt signaling pathway, kidney morphogenesis and cilium assembly. Mutations in the gene associated with RHPD1 include homozygous and compound heterozygous missense mutations and splice site mutations that result in premature termination.

Epidemiology in the Arab World

Saudi Arabia
Al-Hamed et al. (2016) described a cohort of 44 Saudi Arabian families affected by antenatal cystic kidney disease and carried out a genetic screening for 90 renal genes. In one family, the antenatal ultrasound showed the fetus to have cystic kidneys and congenital heart malformation. The case resulted in fetal death and DNA was unavailable for analysis. However, the consanguineous parents were both found to be heterozygous for a novel NPHP3 mutation c.2694-1_-2delAG.

References
Al-Hamed MH, Kurdi W, Alsahan N, Alabdullah Z, Abudraz R, Tulbah M, Alnemer M, Khan R, Al-Jurayb H, Alahmed A, Tahir AI, Khalil D, Edwards N, Al Abdulaziz B, Binhumaid FS, Majid S, Faquih T, El-Kalioby M, Abouelhoda M, Altassan N, Monies D, Meyer B, Sayer JA, Albaqumi M. Genetic spectrum of Saudi Arabian patients with antenatal cystic kidney disease and ciliopathy phenotypes using a targeted renal gene panel. J Med Genet. 2016; 53(5):338-47. PMID: 26862157.

Related CTGA Records
Nephrocystin 3

External Links
https://www.ncbi.nlm.nih.gov/gtr/all/tests/?term=208540%5Bmim%5D

Contributors

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