Never in Mitosis Gene A-Related Kinase 8

Alternative Names
NEK8
NIMA-Related Kinase 8
JCK, Mouse, Homolog of
Nephrocystin 9
NPHP9

Record Category
Gene locus

WHO-ICD
N/A to gene loci

Incidence per 100,000 Live Births
N/A to gene loci

OMIM Number
609799

Mode of Inheritance
N/A to gene loci

Gene Map Locus
17q11.2

Description
The NEK8 gene encodes a ciliary enzyme belonging to the serine/threonine protein kinase family. This kinase is believed to be required for ciliary biogenesis and renal tubular integrity. It is also known to be involved in the Hippo signaling pathway.

The gene is associated with Renal-Hepatic-Pancreatic Dysplasia 2 (RHPD2), an often fatal disorder characterized by cystic/dysplastic abnormalities in the kidney, liver and pancreas along with cardiovascular, pulmonary and skeletal defects. The gene is also linked to Nephronophthisis 9 (NPHP9), an autosomal recessive renal disease resulting in cysts and eventually, renal failure.

Molecular Genetics
NEK8 is located on the long arm of chromosome 17. The gene spans a length of 17.5 kb of DNA and its coding sequence is spread across 18 exons. The protein encoded by NEK8 has a molecular mass of 74.8 kDa and is made up of 692 amino acids. The gene is expressed in the liver, testis, thyroid, adrenal gland and skin with lower expression in the spleen, colon and uterus. So far, variants associated RHPD2 and NPHP9 have been homozygous transitions resulting in nonsense mutations.

Epidemiology in the Arab World

Saudi Arabia
Al-Hamed et al. (2016) investigated the underlying gene defects in a cohort of 44 Saudi families affected by antenatal cystic kidney disease. In one such family, antenatal ultrasound examination found cystic kidneys, oligohydramnios, cerebellar vermis aplasia, dilated cisterna magna and bilateral bowed femurs. 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 NEK8 mutation c.1401G>A (p.W467*). The nonsense mutation was predicted by 'Mutation Taster' to be disease causing as it would disturb the highly conserved 'regulator of chromatin condensation 1' domain. The variant had a minor allele frequency of 0.000008237 according to the ExAC database.

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
Renal-Hepatic-Pancreatic Dysplasia 2

External Links
https://www.genecards.org/cgi-bin/carddisp.pl?gene=NEK8

Contributors

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