Cancer Prone Disease Section

Mini Review

Neurofibromatosis type 2 (NF2)

Jean-Loup Huret

Genetics, Dept Medical Information, University of Poitiers, CHU Poitiers Hospital, F-86021 Poitiers, France

Published in Atlas Database: March 1998

Online updated version is available from: http://AtlasGeneticsOncology.org/Kprones/NF2Kpr10007.html

DOI: 10.4267/2042/37447


This work is licensed under a Creative Commons Attribution-Non-commercial-No Derivative Works 2.0 France Licence.

© 1998 Atlas of Genetics and Cytogenetics in Oncology and Haematology

Identity

Other names: central neurofibromatosis; bilateral acoustic neurofibromatosis; bilateral acoustic neurinoma; bilateral acoustic schwannomas.

Inheritance: autosomal dominant with almost complete penetrance; frequency is 3/10^5 newborns; neomutation represent 50% of cases; variable expressivity from mild disease through life (Gardner type) to severe condition at young age (Wishart type: with more than 3 tumours).

Clinics

NF2 is an hamartoneoplastic syndrome; hamartomas are localized tissue proliferations with faulty differentiation and mixture of component tissues; they are heritable malformations that have a potential towards neoplasia.

Phenotype and clinics
- Bilateral vestibular (8th cranial pair) schwannomas; other central or peripheral nerve schwannomas; meningiomas; ependymomas.
- Hearing loss (average age 20 yrs), tinnitus, imbalance, headache, cataract in 50%, facial paralysis.
- Café-au-lait spots and cutaneous and peripheral neurofibromas may be present, but less extensively than in neurofibromatosis type 1.

Neoplastic risk

NF2 cases represent about 5% of schwannomas and meningiomas (i.e. risk increased by 2000), appearing at the age of 20, while they are found in the general population at the age of 50 and over.

Prognosis

These tumours are usually benign, but their location within the central nervous system give them a grave prognosis; patients with the Wishart severe form usually do not survive past 50 yrs.

Cytogenetics

Inborn condition

Normal.

Cancer cytogenetics

Chromosome 22 loss is very frequent both in sporadic and in NF2 schwannomas and meningiomas.

Genes involved and Proteins

NF2 (neurofibromin 2)

Location: 22q12

DNA/RNA

Description: 16 exons.

Protein

Description: contains a membrane binding domain and a helix binding to actin of the cytoskeleton.

Expression: wide.

Function: membrane-cytoskeleton anchor; should be a tumour suppressor.

Homology

Band 4.1 family.

Mutations

Germinal: germ-line mutations in NF2 patients lead to protein truncation; splice-site or missense mutations are also found; phenotype-genotype correlations are observed (i.e. that severe phenotype are found in cases with protein truncations rather than those with amino acid substitution).

Somatic: mutation and allele loss events in tumours in neurofibromatosis type 2 and in sporadic schwannomas.
and meningiomas are in accordance with the two-hit model for neoplasia.

References


This article should be referenced as such: