Familial clear cell renal cancer

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Identity

Note: Renal cell carcinomas (RCC) represent 85% of all primary renal tumors. In general, RCCs are sporadic tumors but cases of familial RCC have also been reported. If detected early and without metastases, the disease can be cured surgically with conservation of renal function. Both familial and sporadic cases have in common the presence of abnormalities involving chromosome 3, suggesting a primary role for this chromosome in RCC causation, particularly the clear cell type. An early gene rearrangement due to translocation may be a primary event. Loss of 3p and somatic mutation(s) in a tumor-surpressor-gene(s) on 3p (e.g. VHL) may be recurring events related to tumor progression.

Inheritance: The inherited form of renal cancer is characterized by:
- the tumor is found at an early age compared to sporadic tumors (see below)
- the tumors are found frequently bilateral
- multiple occurrence.

Other (well known) classes of inherited renal cell carcinomas are:
the Von Hippel-Lindau syndrome, and the Lynch syndrome II.
Also chromosome abnormalities may be related to inherited renal cancer.

Clinics

No phenotypic sign.

Neoplastic risk

Multiple and/or bilateral nonpapillary renal cell carcinomas, with median age 45 yrs at diagnosis (range 18-79 yrs, most cases being between 35 and 55 yrs old).

Treatment

If the tumor is detected at an early stage the tumor can be surgically removed, without the lost of the renal function.

Prognosis

Depends on the stage of the tumor at the time of detection.

Cytogenetics

Clear-cell renal cell carcinomas are associated with chromosome 3 translocations and deletions of 3p.

Genes involved and proteins

FHIT

Location
3p14.2

Note
FHIT is a breakpoint spanning gene on chromosome 3 in a constitutional familial case of a t(3;8)(p14;q24) translocation.

DNA/RNA
Description: 10 exons.

Protein
Description: 147 amino acids.

TRC8

Location
8q24
Familial clear cell renal cancer
Bonné A et al.

Note
TRC8 is a breakpoint spanning gene on chromosome 8 in a constitutional familial case of a t(3;8)(p14;q24) translocation.

**DIRC2**

**Location**
3q21

**Note**
Dirc2 is a breakpoinntspanning gene on chromosome 3 in a constitutional familial case of a t(2;3)(q35;q21) translocation.

**DNA/RNA**
Description: The gene spans 73 kb, 9 exons.

**Protein**
Description: 478 amino acids.
Expression: Expression in pancreas, kidney, skeletal muscle, liver, lung, placenta, brain and heart.
Localisation: Proximal tubular cells of the kidney.
Function: May be a transporter.

**DIRC3**

**Location**
2q35

**Note**
Dirc3 is a breakpointspanning gene on chromosome 2 in a constitutional familial case of a t(2;3)(q35;q21) translocation.

**DNA/RNA**
Description: The gene spans 3071 bp and contains 12 exons.

**DIRC1**

**Location**
2q33

**Note**
Dirc1 is a breakpointspanning gene on chromosome 2 in a constitutional familial case of a t(2;3)(q33;q22) translocation.

**DNA/RNA**
Description: DIRC1 gene contains 2 exons and spans approximately 57 kb of genomic DNA.

References


This article should be referenced as such: