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My46 Trait Profile

Hereditary Leiomyomatosis and Renal Cell Cancer

Hereditary leiomyomatosis and renal cell cancer is a cancer syndrome in which individuals have a higher chance to develop certain noncancerous tumors or leiomyomata on the skin, uterine fibroids in women, and kidney cancer. It is caused by mutations in the FH gene which makes the fumarate hydratase enzyme.

Characteristics of Hereditary Leiomyomatosis and Renal Cell Cancer

Individuals with hereditary leiomyomatosis and renal cell cancer (HLRCC) have a higher chance to have certain cancerous (malignant) and noncancerous (benign) tumors called leiomyomas. These leiomyomas typically develop on the skin (i.e., cutaneous leiomyomas) and in women, leiomyomas can also develop in the uterus (i.e., fibroids or uterine leiomyomas). The cutaneous leiomyomas are often light brown in color, frequently appear around age 25, and increase in number and size with age. Although benign, cutaneous leiomyomas can be painful and sensitive to cold temperatures. Women with HLRCC often have many large uterine leiomyomas that can lead to irregular or heavy menstruation with pain. Individuals with HLRCC also have an increased risk for developing kidney cancer (e.g., type 2 papillary renal cancer, collecting duct renal cell carcinoma, and clear cell renal carcinoma); approximately 10-16% of individuals with HLRCC develop kidney cancer in their 40s. Signs and symptoms of kidney cancer may include blood in the urine, lower back pain, and a mass in the kidney that can be felt during a physical examination. Not all individuals with HLRCC develop cancer.

Diagnosis/Testing

HLRCC is usually diagnosed based on clinical findings and family history. Multiple cutaneous leiomyomas along with family history of HLRCC aids in making a diagnosis. Most individuals with HLRCC have a change or mutation in the FH gene. This gene makes the fumarate hydratase enzyme that plays an important role in allowing cells to use oxygen and make energy. The FH gene is also considered a tumor suppressor gene which means that it keeps cells from growing too fast. Mutations in the FH gene do not allow the fumarate hydratase enzyme to work normally and as a result, cell may grow uncontrollably. This uncontrolled growth is what can cause the tumors in affected individuals.

Management/Surveillance

Management of HLRCC includes regular skin examinations, yearly gynecological evaluations for women, and abdominal/pelvic imaging (e.g., CT scan with contrast or MRI) to evaluate for kidney tumors. Cutaneous leiomyomas may be removed either by surgical removal, a procedure that uses extreme cold to destroy the leiomyoma (i.e., cryoablation), or by a procedure that uses a concentrated beam of light to destroy the leiomyoma (i.e., laser ablation). Uterine leiomyomas may be treated by certain medications aimed to reduce the size of the leiomyomas or by surgery (e.g., myomectomy – a surgical procedure to remove the uterine leiomyomas; hysterectomy – a surgical procedure to remove the uterus). Individuals with kidney tumors may be considered for total nephrectomy (i.e., surgical removal of the entire kidney).

It is very important that individuals with HLRCC be followed closely by their healthcare providers. Referral to a high-risk cancer center with a urologic oncology surgeon experienced with renal tumors that are usually seen with HLRCC is recommended to help facilitate the most effective treatment.

Mode of inheritance

HLRCC is inherited in an autosomal dominant pattern. This means inheriting one FH mutation is enough for an individual to be at increased risk of developing HLRCC-related tumors.

Risk to family members

Every child of an affected individual has a 50% chance of inheriting the FH mutation. Majority of affected individuals inherit a mutation from an affected parent. Thus, siblings of an affected individual typically have a 50% chance of inheriting the FH mutation.

Special considerations

None

Resources

Kidney Cancer Association
http://www.kidneycancer.org
Genetics Home Reference: Hereditary leiomyomatosis and renal cell cancer
http://ghr.nlm.nih.gov/condition/hereditary-leiomyomatosis-and-renal-cell-cancer
Cancer.Net: Hereditary Leiomyomatosis and Renal Cell Cancer
http://www.cancer.net/cancer-types/hereditary-leiomyomatosis-and-renal-cell-cancer

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Updated: mm/yyyy **Edited by:** Seema Jamal, MSc, LCGC