Genetics
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Your Guide to Understanding
Genetic Conditions

Bladder cancer

Bladder cancer is a disease in which certain cells in the bladder become abnormal and multiply without control or order. The bladder is a hollow, muscular organ in the lower abdomen that stores urine until it is ready to be excreted from the body. The most common type of bladder cancer begins in cells lining the inside of the bladder and is called transitional cell carcinoma (TCC).

Bladder cancer may cause blood in the urine, pain during urination, frequent urination, or the feeling that one needs to urinate without results. These signs and symptoms are not specific to bladder cancer, however. They also can be caused by noncancerous conditions such as infections.

Frequency

In the United States, bladder cancer is the fourth most common type of cancer in men and the ninth most common cancer in women. About 45,000 men and 17,000 women are diagnosed with bladder cancer each year.

Causes

As with most cancers, the exact causes of bladder cancer are not known; however, many risk factors are associated with this disease. Many of the major risk factors are environmental, such as smoking and exposure to certain industrial chemicals. Studies suggest that chronic bladder inflammation, a parasitic infection called schistosomiasis, and some medications used to treat cancer are other environmental risk factors associated with bladder cancer.

Genetic factors are also likely to play an important role in determining bladder cancer risk. Researchers have studied the effects of mutations in several genes, including FGFR3, RB1, HRAS, TP53, and TSC1, on the formation and growth of bladder tumors. Each of these genes plays a critical role in regulating cell division by preventing cells from dividing too rapidly or in an uncontrolled way. Alterations in these genes may help explain why some bladder cancers grow and spread more rapidly than others.

Deletions of part or all of chromosome 9 are common events in bladder tumors. Researchers believe that several genes that control cell growth and division are probably located on chromosome 9. They are working to determine whether a loss of these genes plays a role in the development and progression of bladder cancer.

Most of the genetic changes associated with bladder cancer develop in bladder tissue during a person’s lifetime, rather than being inherited from a parent. Some people, however, appear to inherit a reduced ability to break down certain chemicals, which
makes them more sensitive to the cancer-causing effects of tobacco smoke and industrial chemicals.

Inheritance Pattern
Bladder cancer is typically not inherited. Most often, tumors result from genetic mutations that occur in bladder cells during a person's lifetime. These noninherited genetic changes are called somatic mutations.

Other Names for This Condition
- Cancer of the bladder
- Malignant tumor of urinary bladder
- Urinary bladder cancer

Diagnosis & Management

Genetic Testing Information
- What is genetic testing? 
  /primer/testing/genetictesting
- Genetic Testing Registry: Bladder cancer, transitional cell, somatic 

Research Studies from ClinicalTrials.gov
- ClinicalTrials.gov 
  https://clinicaltrials.gov/ct2/results?cond=%22bladder+cancer%22

Other Diagnosis and Management Resources
- MedlinePlus Encyclopedia: Bladder Cancer 
  https://medlineplus.gov/ency/article/000486.htm
- National Cancer Institute: Bladder Cancer Treatment (PDQ®)–Patient Version 

Additional Information & Resources

Health Information from MedlinePlus
- Encyclopedia: Bladder Cancer 
  https://medlineplus.gov/ency/article/000486.htm
- Health Topic: Bladder Cancer 
  https://medlineplus.gov/bladdercancer.html

Genetic and Rare Diseases Information Center
- Bladder cancer 
  https://rarediseases.info.nih.gov/diseases/12210/bladder-cancer
Additional NIH Resources

- National Cancer Institute: Bladder Cancer Home Page
  https://www.cancer.gov/types/bladder
- National Cancer Institute: Bladder Cancer Treatment (PDQ®)–Patient Version

Educational Resources

- M. D. Anderson Cancer Center
  https://www.mdanderson.org/cancer-types/bladder-cancer.html
- MalaCards: bladder cancer
  https://www.malacards.org/card/bladder_cancer
- Merck Manual Consumer Version
- Orphanet: NON RARE IN EUROPE: Bladder cancer
  https://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=157980
- Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins
  https://www.hopkinsmedicine.org/kimmel_cancer_center/

Patient Support and Advocacy Resources

- American Cancer Society
- National Coalition for Cancer Survivorship
  https://www.canceradvocacy.org/

Scientific Articles on PubMed

- PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28Bladder+Neoplasms%5BMAJR%5D%29+AND+%28bladder+cancer%5BTI%5D%29+AND+review%5Bpt%5D+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+360+days%22%5Bdp%5D

Catalog of Genes and Diseases from OMIM

- BLADDER CANCER
  http://omim.org/entry/109800

Medical Genetics Database from MedGen

- Bladder cancer, somatic
Sources for This Summary

- American Cancer Society: What Are the Key Statistics for Bladder Cancer?
  https://www.cancer.org/cancer/bladder-cancer/about/key-statistics.html

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/15705065

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/15705066

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/15794774

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/15324694

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/16532037

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/16470587

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/14532839

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/12629332

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/15684659

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/16474624

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/12461689

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