ASTHMA

Occurrence

If you have asthma, you're not alone . . . Asthma is the sixth most common chronic condition in our nation, affecting between 12 and 17 million people. In children, asthma usually occurs by age 5 (several studies show that 50 to 80% of children with asthma develop symptoms before their 5th birthday). Adults usually develop asthma in their 30s, but even older adults can contract the disease (about 10% of new cases are people 65 years or older).[1]

Table 1. Percentage of the U.S. Population with Asthma by Age

Age	Percentage
0 to 18	6.1
19 to 44	4.1
45 to 64	4.2
65 and older	5.2
All Ages	**4.8**

Source: National Health Interview Survey, National Center for Health Statistics, 1989

Annually, asthma accounts for 10 million missed school days, 10.4 million physician visits, 1.8 million emergency room visits, and 470,000 hospitalizations. According to the Centers for Disease Control and Prevention, the number of asthma deaths has increased since 1978 from 1,800 to 5,400 per year. Mortality is particularly high for African Americans. In 1992, the asthma death rate among African Americans ages 5 to 24 was five times greater than among Caucasians.[2]

Medical Description

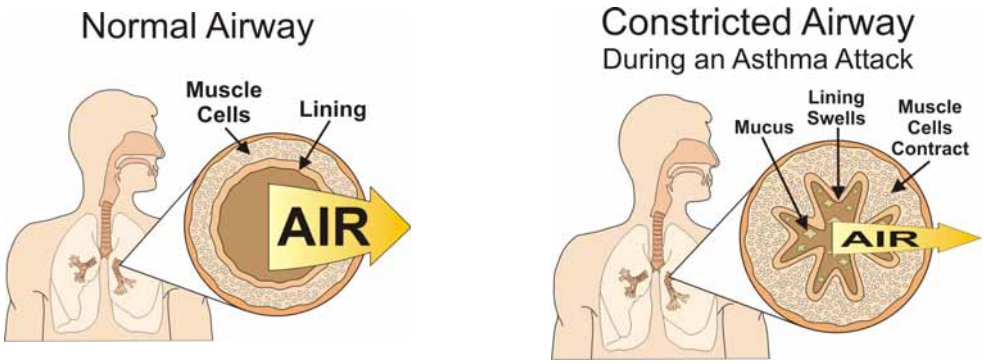
Asthma is a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role, in particular, mast cells, eosinophils, T-lymphocytes, neutrophils, and epithelial cells. This inflammation can cause repeated episodes of wheezing (a whistling or hissing sound while you breathe), breathlessness, chest tightness, and coughing, particularly at night and in the early morning. These episodes are usually associated with widespread but variable airflow obstruction that is often reversible either spontaneously or with treatment. The inflammation also causes an associated increase in the existing bronchial hyper responsiveness to a variety of stimuli.[1]

Asthma Attack

Asthma is a breathing difficulty caused by obstruction of the air passages in the lungs, either through swelling of the membrane lining the tubes, contraction of

the tiny muscles around the tubes, or plugging of the tubes with mucus. As a result, the lungs become distended, breathing becomes increasingly labored, and the chest begins to expand. As the patient starts to wheeze and cough, the neck muscles strain and the neck veins become engorged with mucus.

Asthma can be different from person to person and from attack to attack. For some, it causes only mild symptoms once in a while. For others, every day can be a struggle to breathe. Some asthma attacks last a few minutes—others go on for days. Some asthma attacks are mild while others are life-threatening.



Asthma Triggers

Most asthma symptoms start when irritating substances (called triggers) affect the airways of the lungs. These triggers can vary and include cigarette smoke and indoor allergens like dust mites, cat dander, and cockroach antigen. Viral infections, exercise, and polluted air can also trigger symptoms. Following is a list of various asthma triggers.

Infection. Bacterial or viral infections triggering asthma are principally those involving the sinuses, throat, and bronchi. In fact, among children 5 years of age and younger, the most common cause of asthma symptoms is viral respiratory infection. In some cases the infection produces inflammation which obstructs the air passages. In other cases, patients reacts to the bacteria in their own bodies just as they would react to an allergen from any other source. In either case, the infection causes the asthma.

Environmental. If you have allergies, you're more prone to asthma. At least 90% of children and 50% of adults with asthma also have allergies. One out of every four hay fever patients develops asthma—mainly because of an allergy to the same foreign substances.[1]

Scientists also believe that air pollution triggers asthma. Indeed, experiments have shown that air pollutants such as ozone, sulfur dioxide, nitrogen dioxide, and cigarette smoke, lead to a release of histamine—the same substance that causes allergic reactions—in human lungs.[1]

Genetic. If one of your parents has asthma, then you are more likely to get it. Older persons may suffer from a type of asthma that is associated with heart disease.

Occupational. One form of asthma, occupational asthma, is a lung disease in which the airways overreact to dusts, vapors, gases, or fumes present in the workplace. Occupational lung diseases are the number one group of work-related illnesses in the nation.[3]

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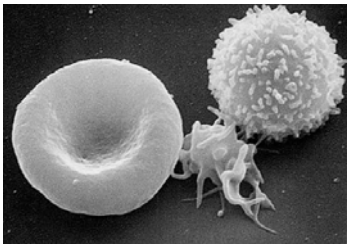
LEUKEMIA

Occurrence

Every year approximately 27,000 adults and more than 2,000 children are diagnosed with leukemia in the United States.[1] About 41% of all cases are chronic forms of leukemia, and they affect mostly adults. In fact, leukemia affects 10 times more adults than children. In general, leukemia affects 50% more men than women throughout the world, except for Vietnamese where men have only a slightly higher rate than women. Leukemia is the most common type of cancer in children. Mortality rates for children are low because the treatment for pediatric leukemia is quite successful. Leukemia mortality rates are highest among whites and blacks, and Hawaiian men. Rates for Asians are relatively low.[2] The 5-year survival rate for leukemia in general is 44% (see details for specific types of leukemia in the section on *types of leukemia)*.[3]

Description

Leukemia is a cancer of the blood cells. To understand leukemia, it is useful to first understand how blood cells function.



White blood cell, platelet, and red blood cell

The blood is composed of a fluid called plasma and three types of cells, each with a different function.

- *White blood cells* (leukocytes) protect the body against infections and diseases.
- *Red blood cells* (erythrocytes) supply oxygen to the body. Erythrocytes give blood their color.
- *Platelets* (thrombocytes) help form blood clots that control bleeding.

Blood cells are formed in a orderly controlled manner in the bone marrow, the soft spongy center of the bones. Leukemia, which means “white blood” in Greek develops when the body produces excessive amounts of white blood cells. If left untreated the surplus leukemic cells overwhelm the bone marrow, enter the blood stream, and eventually invade the entire body.

Types of Leukemia

Leukemias are grouped either by how quickly the disease develops (acute versus chronic) or by the type of white blood cells that are affected (lymphoid cells versus myeloid cells). Acute leukemias develop suddenly whereas chronic leukemias make take years to develop. There are over a dozen types of leukemia, but following are the four major types:

Acute lymphocytic leukemia (ALL) is the most common type of leukemia in children under 10 years of age, although people over 65 can also develop the disease. Eighty percent of childhood leukemias are ALL. The 5-year survival rate for ALL in children is 81%. The overall 5-year survival rate for ALL is 58%.

Acute myeloid (or myelogenous) leukemia (AML) occurs both in children and adults. AML is aggressive and requires immediate treatment. AML is the most

common type of leukemia in adults. The 5-year survival rate for AML in children is 43%. The overall 5-year survival rate for AML is 14%.
Chronic lymphocytic leukemia (CLL) affects mainly adults over 55 years of age and sometimes adolescents. CLL is the second most common type of leukemia in adults. CLL very rarely affects children. The overall 5-year survival rate for CLL is 71%.

Chronic myeloid (or myelogenous) leukemia (CML) occurs mainly in adults (average age is 40–50 years old) but also in a small number of children. CML may require intensive treatment, depending on the stage. The overall 5-year survival rate for CML is 32%.

Causes

The causes of most types of leukemia are unknown. However, several risk factors are associated with leukemia, such as ionizing radiation, certain chemotherapeutic drugs used to treat other types of cancer, and some chemicals (especially benzene). Some childhood leukemias may result from parental exposure before conception or during early fetal development. Following is a detailed list of factors that contribute to leukemia.[4]

Genetics: The risk of leukemia is increased 15-fold in children with Down's syndrome. Three rare inherited disorders—Fanconi's anemia, Bloom's syndrom, and ataxia telangiectasia—also greatly increase the risk of leukemia. In addition, race or ethnicity seems to play a role in the disease. For example, CLL rates are high in certain Jewish groups, whereas Asians rarely develop CLL. First-degree relatives (parents, children, siblings) of CLL patients have a 2- to 4-fold increased chance of contracting the disease.

Age: Fifty to sixty percent of leukemia cases occur in people over 50 years of age.

Infection: The human T-cell leukemia virus I (HTLV-I) is related to acute T-cell leukemia. However, this type of leukemia is rare in the United States and Europe.

Occupational: Workers in the following industries have an increased risk of contracting leukemia :
Nuclear industry. People working in the nuclear industry and who are exposed to massive doses of radiation have a high risk of contracting all types of leukemia, except CLL.
Chemical industry. Workers occupationally exposed to certain chemicals such as solvents, herbicides, and pesticides have an increased risk of leukemia. Workers exposed to benzene for a long time have a 20-fold risk of contracting acute leukemia. Some reports that workers exposed to dioxin, styrenes, butadienes, and ethylene oxides also have an increased risk of developing leukemia.
Animal-related industry. Workers exposed to animal viruses (butchers, slaughterhouse workers, veterinary staff) have a high rate of leukemia.

Environmental: People who have been exposed to high doses of radiation, such as atomic bomb survivors and people living near a nuclear reactor accident site are at risk of contracting leukemia. However, routine x-rays do not pose a risk.

Medical therapy. Drugs used to treat other types of cancer can cause secondary leukemia (leukemia that arises after cancer therapy). The specific drugs are procarbazine, chlorambucil, etoposide, mechlorethamine, teniposide, and cyclophosphamide.

Lifestyle. Scientists believe that 25% of AML cases are caused by smoking. The cancer-causing chemicals (carcinogens) in tobacco include benzene, polonium-210, and polycyclic aromatic hydrocarbons (PAHs). These carcinogens are absorbed by the lungs and spread through the bloodstream.

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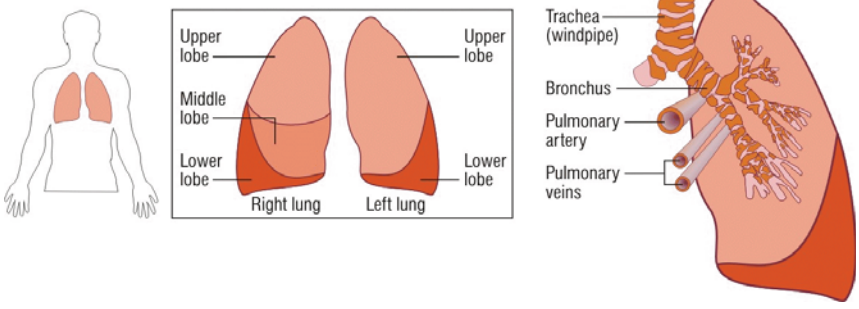
LUNG CANCER

Occurrence

Lung cancer is the leading cause of cancer death for both men and women. More people die of lung cancer than of colon, breast, and prostate cancers combined. The average age of people who have lung cancer is 60 and it is fairly rare in people under the age of 40. It occurs most often in people who smoke.

World-wide over 1 million people are diagnosed with lung cancer each year. An estimated 164,100 new cases of lung cancer occur in the United States every year. (about 156,900 of these will die). The rate of lung cancer among men as a whole in the United States has been declining in recent years (dropping from 86.5 per 100,000 in 1984 to 70.0 in 1996). Although the lung cancer incidence rates for both African-American and Caucasian males decreased between 1984 and 1996, the rates for African-American males (101.4 per 100,000) is almost 40% higher than the rate for Caucasian males (68.4 per 100,000).

The incidence of lung cancer in women has climbed at an alarming rate, mainly because the number of women who smoke is on the rise. A new Health and Human Services report on women and smoking states that tobacco is responsible for 90% of lung cancer cases in women. Rates of lung cancer have risen from 5 cases per 100,000 women in 1960 to 35 per 100,000 in 2000. In fact, lung cancer rates in women began to surpass breast cancer rates in 1987.



Medical Description

The lungs are a pair of cone-shaped organs situated inside the chest that bring oxygen into the body and take out waste carbon dioxide.
Cancers that begin in the lungs are divided into two major types, Non-Small Cell Lung Cancer (NSCLC) and Small Cell Lung Cancer (SCLC), depending on how the cells look under a microscope. Each type of lung cancer grows and spreads in different ways and is treated differently.[1,2]

Non-small cell lung cancer is more common than SCLC, and it generally grows and spreads more slowly. NSCLCs are more likely than the SCLC to be localized at the time of diagnosis. As a group, they are also more likely than SCLCs to be

treatable with surgery or radiation therapy, but they often show a poor response to chemotherapy. These lung cancers are divided into several subgroups based on the microscopic appearance of their cancerous cells:

- **Adenocarcinoma (40% of cases)**—This is the most common type of lung cancer. Although it is definitely related to smoking, it is also the most common type of lung cancer seen in nonsmokers. It is the most frequent form of lung cancer seen in women and in patients under 45 years of age. It usually develops near the periphery of the lung and may involve the pleura (membrane covering the lung).
- **Squamous cell (epidermoid) carcinoma (25% of cases)**— This form of lung cancer develops as an abnormal mass near the center of the lungs. As the mass enlarges, it may show endobronchial growth (the tumor protrudes into one of the bronchi, the larger air passages). In 10 to 20% of cases, the tumor cavitates (forms a cavity in the lungs).
- **Large cell carcinoma (15% of cases)**—Like adenocarcinoma, large cell carcinoma tends to develop at the periphery of the lungs and spread to the pleura. Like squamous carcinoma, it cavitates in 10 to 20% of patients.
- **Adenosquamous carcinoma, undifferentiated carcinoma, and bronchioloalveolar carcinoma**—These are three relatively rare forms of NSCLC.

Small cell lung cancer (or oat cell cancer) is less common than NSCLC. At the time of diagnosis, SCLC is more likely than NSCLC to have spread beyond the local boundaries of the lung. This typically makes it almost impossible to cure surgically; however, chemotherapy and/or radiation therapy can be used for cancer management. SCLC account for about 20% of all lung cancers.[2]

Causes

Lung cancer usually occurs because some outside factor, called a carcinogen, triggers the growth of abnormal, cancerous cells in the lung. These cancerous cells multiply out of control, ultimately forming a mass called a tumor. As the tumor grows, it destroys nearby areas of the lung. Sometimes this may produce a cough, bloody sputum, and chest pain; but sometimes patients may remain asymptomatic (having no symptoms). Eventually, the tumor's abnormal cells may spread (metastasize) to nearby lymph nodes and to other organs.[3]

Ninety percent of lung cancers are related to smoking.[4] Other factors include radon, asbestos, and tuberculosis.

Genetic. Knowledge about complex gene-environment interactions relating to tobacco smoking and lung cancer are emerging. Glutathione S-transferases including GSTM1, GSTM3, GSTP1 and GSTT1 play a role in detoxifying metabolites of carcinogens in tobacco smoke. Research suggests that some people with common polymorphisms of these genes may be more susceptible to lung cancer from exposure to environmental tobacco smoke (ETS). One study

found that non-smokers with a common genetic polymorphism of GSTM1 have a statistically significant greater risk of lung cancer from ETS.[5] For example, in a case-control study of 136 NSCLC patients results suggested that the effect of the GSTM1 null genotype is greatest in female smokers.[6] About half the population carry this polymorphism—the "GSTM1 null allele."

There are conflicting results about the relationship between specific polymorphisms and lung cancer. Research is ongoing to clarify their roles in gene-environment interactions.[1]

Infection. Certain lung diseases, such as tuberculosis (TB), increase a person's chance of developing lung cancer. Lung cancer tends to develop in areas of the lung that are scarred from TB.[2]

Occupational. Asbestos is the name of a group of minerals that occur naturally as fibers used in certain industries. Asbestos fibers tend to break easily into particles that can float in the air and stick to clothes. When the particles are inhaled, they can lodge in the lungs, damaging cells, and increasing the risk for lung cancer. Workers who have been exposed to large amounts of asbestos have a risk of developing lung cancer that is 3 to 4 times greater than that of unexposed workers. The risk of lung cancer is even higher if asbestos workers also smoke.

Environmental. The following environmental factors increase the chance of contracting lung cancer.

- *ETS.* The chance of developing lung cancer is increased by exposure to environmental tobacco smoke (ETS or secondhand smoke). Exposure to ETS, is called involuntary or passive smoking. In a large meta-analysis of 4,626 cases,[3] the excess risk of lung cancer was 24% (95% confidence interval 13% to 36%) in non-smokers who lived with a smoker.[5]

- *Radon* is an invisible, odorless, and tasteless radioactive gas that occurs naturally in soil and rocks. It can cause damage to the lungs that may lead to lung cancer. People who work in mines may be exposed to radon and, in some parts of the country, radon is found in houses. Smoking increases the risk of lung cancer even more for those already at risk because of exposure to radon.

- *Pollutants.* Researchers have found a link between lung cancer and exposure to certain air pollutants, such as by-products of the combustion of diesel and other fossil fuels. However, this relationship has not been clearly defined, and more research is being done.[2]

Lifestyle. Smoking cigarettes, cigars, and pipes, causes lung cancer. Harmful substances, called carcinogens, in tobacco damage the cells in the lungs. Over time, the damaged cells may become cancerous. The likelihood that a smoker

will develop lung cancer is affected by the age at which smoking began, how long the person has smoked, the number of cigarettes smoked per day, and how deeply the smoker inhales. Stopping smoking greatly reduces a person's risk for developing lung cancer. Even cigar and pipe smokers who do not inhale are at increased risk for lung, mouth, and other types of cancer.

A person who has had lung cancer once is more likely to develop a second lung cancer compared with a person who has never had lung cancer. Quitting smoking after lung cancer is diagnosed may prevent the development of a second lung cancer.[2]

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PARKINSON'S DISEASE

Occurrence

Parkinson's disease (PD) is the second most common chronic degenerative disease, after Alzheimer's disease. An estimated 1.5 million Americans have PD. However, because there is no test to clearly diagnose PD, that figure is probably an underestimation. Some experts believe that for every 1 case diagnosed, 20 remain undetected.[5] PD can appear at any age but most cases appear after the age of 50 and the risk of getting PD increases with age. One out of every ten adult over 60 has PD and the average age of onset is 57 years. Only 15% of patients are diagnosed before the age of 50 and PD is very uncommon under the age of 30. The disease affects slightly more men than women. African-Americans and Asian-Americans have a lower risk of contracting PD than Americans of European descent.

Description

PD is a chronic neurological disease of the central nervous system. When PD develops, neurons in an area of the brain called the substantia nigra start to degenerate. The substantia nigra produces dopamine, a chemical substance which control body movements. In PD patients, there is a severe shortage of dopamine, which causes the impaired movements, such as trembling and shaking of limbs, typical of the disease. PD is neither fatal, nor contagious, but the symptoms tend to worsen over time. PD is named after a London physician who first described it in 1817.

Causes

The causes of PD are unknown. However, PD seems to stem from a combination of three factors: genetic predisposition, environmental exposures, and age. Following is a more detailed description of these factors.[6]

Genetics: A defective gene was found in families with high incidences of PD. However, researchers believe that genetic factors are not the sole cause of the disease. They believe that PD is caused by a combination of genetic predisposition and some, as yet unnamed, environmental factor.

Environmental: Increased incidences of parkinsonian symptoms have been noted in the following instances: exposure to manganese, carbon monoxide, pesticides, and herbicides; consumption of well water; and living in a rural environment, near industrial plants, printing plants, or quarries. However, there is no firm evidence positively linking these environmental factors to PD.

Several NIEHS-sponsored studies are investigating the environmental triggers of PD.[2] A link between long-term (20 years or more) occupational exposure to a combination of certain heavy metals (lead, copper, and iron) and PD has been established.

Age. Age may be a factor of PD because 85% of the time the disease affects people after the age of 50.

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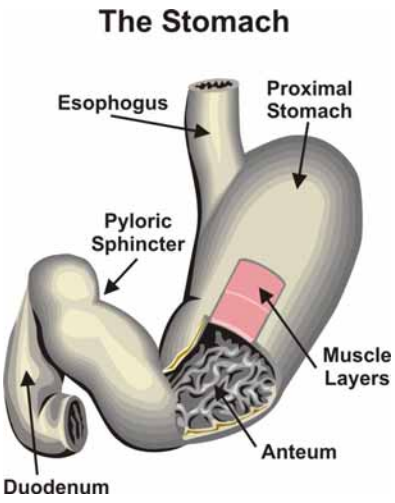
STOMACH CANCER

Occurrence

Every year, an estimated 21,700 Americans are diagnosed with stomach cancer (also called gastric cancer) and an estimated 12,800 people die from the disease. There is a sharp increase in stomach cancer after the age of 50. In fact, most people diagnosed with stomach cancer are in their 60s and 70s.[1]

The 5-year survival rate for all stages of stomach cancer combined is about 21%. The 5-year survival rate for early stage cancers of the proximal stomach (the upper portion of the stomach closest to the esophagus) is about 10 to 15%. For early stage cancers in the distal stomach (the lower portion of the stomach closest to the intestines), the 5-year survival rate is about 50%.[1]

Stomach cancer is not contagious.[2,3] It affects men twice as often as women, and is more common in African-Americans than in Caucasians. The disease is also more common in some parts of the world—such as Asia, Central Europe, Central and South America— than in the United States. In fact, stomach cancer is the leading cause of cancer in Japan, Chile, Costa Rica, Hungary, and Poland. A main reason seems to be related to diets. People in these areas eat many foods that are preserved by drying, smoking, salting, or pickling. Scientists believe that eating foods preserved in these ways may play a role in the development of stomach cancer. Eating fresh foods (especially fresh fruits and vegetables) and refrigerated foods may protect against the disease, which may explain why, in the United States, stomach cancer is now only one-fourth as common as it was in 1930.[1, 2]



The Stomach

The stomach is part of the digestive system. It is located in the upper abdomen, under the ribs. The upper part of the stomach connects to the esophagus, and the lower part leads into the small intestine (or deodenum). Other organs next to the stomach include the colon, liver, spleen, and pancreas.

The stomach is shaped somewhat like the letter "J." The upper portion is the proximal stomach. Some cells of this area of the stomach produce acid and pepsin (a digestive enzyme), the ingredients of the gastric juice that help digest food. The lower portion is the distal stomach. This area includes the antrum, where the food is mixed with gastric juice, and the pyloric

sphincter, which acts as a valve to control emptying of the stomach contents into the small intestine.

After food is chewed and swallowed, it enters the esophagus, a tube-shaped organ that carries food through the neck and chest. The esophagus joins the stomach just beneath the diaphragm (the breathing muscle under the lungs). When food enters the stomach, muscles in the stomach wall create a rippling motion that mixes and mashes the food. At the same time, juices made by glands in the lining of the stomach help digest the food. After about 3 hours, the food and gastric juice are mixed into a thick fluid called chyme, which is then emptied into the first part of the small intestine.

Medical Description

In nonmedical conversation, stomach often refers to the area of the body between the chest and the pelvic area. The correct term for this area is the abdomen. Some patients with diseases of the appendix, small intestine, colon (large intestine), or gallbladder may say they have a stomach ache. The correct description is abdominal pain. This distinction is important because the stomach is only one of many organs in the abdomen in which cancers may develop. Stomach cancer should not be confused with cancers of the colon, liver, pancreas, small intestine, or gallbladder, because these cancers may have different symptoms, prognosis (outlook for survival), and treatments.

Cancer can develop in any section of the stomach, producing different symptoms and outcomes. The location can also affect the treatment options.

Stomach cancers are believed to develop slowly over many years. Before a true cancer develops, precancerous changes usually occur in the lining of the stomach. These early changes rarely produce symptoms and often go undetected.

If left untreated, stomach cancers can spread by different means. They can grow through the wall of the stomach and involve the nearby organs. They can also spread through the bloodstream or lymph system to form distant colonies of cancer called metastasis.

Approximately 90 to 95% of the cancerous tumors of the stomach are adenocarcinomas. This cancer develops from the cells that form the inner lining of the stomach called the epithelium.[2] The term stomach cancer almost always refers to adenocarcinoma of the stomach.

Following are other, rarer types of cancer found in the stomach. Their treatment and outlook differ from that of adenocarcinoma.[1]

Lymphomas. These cancers of the immune system tissue are sometimes found in the wall of the stomach. Prognosis and treatment depend on whether the cancer is an aggressive lymphoma or an indolent (slowly growing) lymphoma of mucosa-associated lymphoid tissue (MALT). Lymphomas account for about 4% of stomach cancers.

Carcinoid tumors. These are tumors of hormone-producing cells of the stomach. Most do not spread to other organs. Carcinoid tumors account for about 3% of stomach cancers.

Gastric stromal tumors. These tumors develop from the muscle or connective tissue of the stomach wall. Some are benign; others are malignant (cancerous). The malignant stomach tumors, or gastric sarcomas, make up about 2% of stomach cancers.

Causes

The stomach cancer rates and mortality in the United States have gone down dramatically over the past 60 years. Still, stomach cancer is a serious disease. Several risk factors make a person more likely to develop stomach cancer. (A risk factor is anything that increases one's chance of getting a disease.) Different cancers have different risk factors. For example, smoking is a risk factor for lung, larynx, mouth, and many other cancers. Unprotected exposure to sunlight is a risk factor for skin cancer. There are many known risk factors for stomach cancer, however, exactly how all of these factors cause cells of the stomach lining to become cancerous remains unknown and is the subject of ongoing research.[1] Following is a list of factors that contribute to stomach cancers.

Genetic. Stomach cancer is twice as common in men than in women. Also, people whose close blood relatives have had stomach cancer are more likely to develop the disease. People with type A blood group also have a higher risk of developing stomach cancer. Furthermore, people who have hereditary nonpolyposis colon cancer (HNPCC) or Lynch Syndrome and Familial Adenomatous Polyposis, two inherited genetic disorders, have a greatly increased risk of developing colorectal cancer and a slightly increased risk of stomach cancer.

Infection. Stomach ulcers do not appear to increase a person's risk of getting stomach cancer. However, some studies suggest that helicobacter pylori, a type of bacteria which may cause stomach inflammation and ulcers, may be an important risk factor for stomach cancer. Long-term infection of the stomach with this bacterium may lead to chronic atrophic gastritis (inflammation and damage to the inner layer of the stomach), a possible precancerous change of the stomach lining.

Patients with adenocarcinoma of the stomach have a higher rate of infection than people without this cancer. Helicobacter infection is also associated with some types of lymphoma of the stomach. However, the vast majority of people who carry this bacterium in their stomach never develop cancer.

Diverticulosis is an inflammation of the small sacs or pouches (diverticula) in the walls of an organ such as the stomach or colon. This condition may be a risk factor for certain types of cancer.

Occupational. Exposure to certain dusts and fumes in the workplace has been

linked to a higher than average risk of stomach cancer. Also, some scientists believe that smoking may increase stomach cancer risk.[4]

Lifestyle. An increased risk of stomach cancer is associated with diets containing large amounts of smoked foods, salted fish and meat, foods high in starch and low in fiber, and pickled vegetables. Nitrates and nitrites are substances commonly found in cured meats, some drinking water, and certain vegetables. They can be converted by certain bacteria, such as helicobacter pylori, into compounds that cause stomach cancer in animals. Eating whole grain products, fresh fruits and vegetables that contain vitamins A and C appears to lower the risk of stomach cancer.

Tobacco and alcohol abuse can also increase stomach cancer risk, particularly for cancers of the proximal stomach. In addition, people who have had stomach surgery or have pernicious anemia, achlorhydria, or gastric atrophy (which generally result in lower than normal amounts of digestive juices) have an increased risk of stomach cancer.

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