

Detection of human papillomavirus DNA in tumors from Rwandese breast cancer patients

Thierry Habyarimana

Institute of Applied Sciences, Rwanda

Cancer, also called malignancy, is an abnormal growth of cells. There are more than 100 types of cancer, including breast cancer, skin cancer, lung cancer, colon cancer, prostate cancer, and lymphoma. Symptoms vary depending on the type. Cancer treatment may include chemotherapy, radiation, and/or surgery. Throughout our lives, healthy cells in our bodies divide and replace themselves in a controlled fashion. Cancer starts when a cell is somehow altered so that it multiplies out of control. A tumor is a mass composed of a cluster of such abnormal cells. Most cancers form tumors, but not all tumors are cancerous. Benign, or noncancerous, tumors do not spread to other parts of the body, and do not create new tumors. Malignant, or cancerous, tumors crowd out healthy cells, interfere with body functions, and draw nutrients from body tissues. Cancers continue to grow and spread by direct extension or through a process called metastasis, whereby the malignant cells travel through the lymphatic or blood vessels -- eventually forming new tumors in other parts of the body. The major types of cancer are carcinoma, sarcoma, melanoma, lymphoma, and leukemia. Carcinomas -- the most commonly diagnosed cancers -- originate in the skin, lungs, breasts, pancreas, and other organs and glands. Lymphomas are cancers of lymphocytes. Leukemia is cancer of the blood. It does not usually form solid tumors. Sarcomas arise in bone, muscle, fat, blood vessels, cartilage, or other soft or connective tissues of the body. They are relatively uncommon. Melanomas are cancers that arise in the cells that make the pigment in skin. Cancer has been recognized for thousands of years as a human ailment, yet only in the past century has medical science understood what cancer really is and how it progresses. Cancer specialists, called oncologists, have made remarkable advances in cancer diagnosis, prevention, and treatment. Today, more people diagnosed with cancer are living longer. However, some forms of the disease remain frustratingly difficult to treat. Modern treatment can significantly improve quality of life and may extend survival.

There are no cures for any kinds of cancer, but there are treatments that may cure you. Many people are treated for cancer, live out the rest of their life, and die of other causes. Many others are treated for cancer and still die from it, although treatment may give them more time: even years or decades. You're more likely to get cancer as you get older. In fact, age is the biggest risk factor for the disease. More than nine out of 10 cancers are diagnosed in people 45 and older. Seniors older than 74 make up almost 28% of all new cancer cases. Researchers aren't sure why this is so. It could be that the passing decades

give your cells more time to turn faulty, or mutate, and grow into cancer. Or older age simply means you've been exposed to sunlight, cigarette smoke, chemicals, and other cancer-causing agents for longer. This is another way of saying the number of new cancer cases in a certain group of people. In the U.S., the number of new cancer cases per year has been falling slowly for more than a decade. Incidence rates give an important but incomplete picture of cancer. For example, cancer incidence can go up if more people are getting screened. Such was the case during the early 1990s, when incidences of prostate cancer in men surged after widespread testing. An estimated 1.81 million people in the U.S. are expected to be diagnosed with cancer in 2020. About 606,000 people are expected to die from any type of cancer. Cancer death rates have improved steadily since the early 1990s. You can get cancer at any age, including as infants and toddlers. But cancer is mostly a disease of middle age and beyond. The median age at diagnosis is 66, meaning that half of all new cases are found before then and half are diagnosed later. Human Papilloma Virus (HPV) have been implicated in the development of cancer of the cervix, mouth and throat, anus, penis, vulva, or vagina, but it has not been much considered as a cause of breast cancer. However, a growing number of investigations have linked breast cancer to viral infections, including Human Papillomavirus (HPV), Epstein-Barr virus (EBV), Mouse Mammary Tumor Virus (MMTV), and Human Cytomegalovirus (HCMV). Human papilloma viruses (HPVs) are non-enveloped DNA virus belonging to the Papillomaviridae family. Over 170 types of HPV have been identified, the majority of which affect the genital tract epithelia, the mucosa of the upper respiratory tract and the skin (2, 3). HPVs are categorized as high risk or low risk, depending on their carcinogenic potential. High-risk HPV types causes cancer, however Low-risk types are not carcinogenic but cause benign anogenital warts and recurrent respiratory papillomatosis. High-risk HPV types, predominantly are established as carcinogens in humans, while HPV-68 is probably carcinogenic. HPV types 16 and 18 are the most common high-risk types and are responsible for > 70% of all cervical cancer cases. HPV are characterized by the presence of three functional code regions in their genome: The E region that codes the early viral function, the L region which is responsible for the late viral function and the long control region (LCR)(2). Even though HPVs are known to be responsible for the development of cervical cancers, HPV infections are often asymptomatic, and most sexually active individuals become infected with HPV at least once in their lifetime .

Note: This work is partially presented at 21st World Congress on Radiology & Cancer Research during August 27-28, 2018 at Toronto, Canada