Free research paper on biology of cancer

Health & Medicine, Cancer

Introduction

Body cells normally grow, divide, and die in a systematic manner. During adulthood, most cells divide to repair injuries or to replace the dying (worn-out) cells. Some cells, however, grow out of control. These cells are referred to as the cancer cells. Instead of dying, the cancer cells grow out of control (abnormally) and form new abnormal cells. Besides, the cancer cells can invade normal tissues. In most cases, the cancer cells form a mass of body cells that are malignant and have no physiological function, usually called the tumors. When they get into the blood stream or the lymph vessels, cancer cells travel to other parts of the body, begin to grow and form tumors which normally replace the normal tissues (CDC 2010). Cancer cells are named based on where they first started. A woman's reproductive organs are affected by various types of cancer called the gynecologic cancer. This paper focuses on endometrial, uterine and cervical cancer. It describes the main types, risks factors, symptoms and diagnosis, and the treatment and prognosis of these types of cancer. It also highlights the current state of affairs and the future developments regarding these types of cancer.

Endometrial cancer

Endometrial cancer starts in the inner lining of the uterus (endometrium). There are two types of endometrial cancers: endometrial carcinoma, and uterine carcinosarcoma (CS). Endometrial carcinoma starts in the cells that form the glands in the uterus lining. Most of the endometrial carcinomas are adenocarcinomas and the most common type is the endometrioid adenocarcinoma. Uterine carcinosarcomas have similar features to

endometrial carcinoma and sarcoma. The risk factors, the spread, and the treatment of CS is similar to endometrial carcinoma. Currently, endometrial cancer is the most common gynecologic cancer in United States (ACS 2012b).

Risk factors

In basic terms, a risk factor of cancer is whatever thing that changes ones chance of getting cancer. For endometrial cancer, the risk factors are hormone levels, estrogen therapy, birth control pills, the number of periods (menstrual cycles), pregnancy, obesity, among others as discussed hereunder.

Hormone levels – there are two main types of female hormones from the ovaries: estrogen and progesterone. During the menstrual cycle, there is a change in the balance between these hormones. A shift towards more estrogen increases the chances of getting endometrial cancer.

Estrogen therapy – the symptoms of menopause (change of life) are normally treated through estrogen therapy, which helps in reducing hot flashes, improves the vaginal dryness, and prevents osteoporosis. Using estrogen, however, increases the risk of getting endometrial cancer.

Birth control pills – the use of birth control pills reduces the risk of getting endometrial cancer. For women who use the pills for a long time, there are slim chances of getting the cancer.

The total number of periods – a woman with more menstrual cycles during her lifetime has high risks of endometrial cancer. Early periods (below 12 years) or extended periods (above 45 years) raises the risk.

Pregnancy – high number of pregnancies reduces the risk of endometrial

cancer. During pregnancies, there is a shift towards more progesterone hormone. A woman who has never been pregnant has higher endometrial cancer risks (ACS 2012b).

Other factors that increase endometrial cancer risk are obesity (being overweight), ovarian tumors, polycystic ovarian syndrome, high-fat diet, taking tamoxifen, breast or ovarian cancer, and age (increases with age).

Symptoms and diagnosis

So far, there is no recommended test for endometrial cancer before the symptoms develop. The symptoms include unusual bleeding (abnormal vaginal bleeding), spotting, or other discharge that doesn't look like blood, pain in the pelvis, weight loss, and feeling a lump.

Once the symptoms have appeared, a physical and pelvic examination is done. To confirm the disease, some tissue must be removed and observed under microscope. The tissue is removed through endometrial biopsy or dilation and curettage (D & C). If cancer cells are found, a lab test is carried out to determine the type and the grade. Grade 1 cancer cells are similar to normal tissues. Grade 3 tumors are very different from the normal cells. Grade s falls between 1 and 3. Grading helps in determining whether the cancer has spread or is likely to reappear after treatment.

Imaging tests such as ultrasound, Cystoscopy and proctoscopy, CT scan, MRI scan, PET scan, and Chest x-ray can also be done to determine the spread of the cancer cells (ACS 2012b). CA 125 blood test can also be carried out to determine the level of spread of the cells. A very high level of blood CA 125 shows that the cancer cells have spread beyond the uterus.

Treatment and prognosis

The choice of treatment depends on the type and stage of the cancer. Other factors include the overall health, age, and whether the patient plans to have children. The four basic treatments of endometrial cancer are surgery, chemotherapy, radiation treatment, and hormone treatment. The main treatment is surgery; however, one or more treatments can be combined (ACS 2012b).

Surgery and the side effects

For endometrial cancer, hysterectomy operation is normally done to remove the uterus and the cervix. Lymph node surgery can also be done to remove the lymph nodes. After hysterectomy, the patient cannot become pregnant. Removal of ovaries automatically leads to menopause. Removal of lymph nodes in the pelvis can most likely result in lymphedema (buildup of fluid in legs).

Chemotherapy

Here, cancer-fighting drugs are used to kill the cancer cells. While killing the cancer cells, the drugs can damage, and even kill, some normal cells. The side effects depend on the drug used, the amount, and the length of the treatment.

Radiation treatment

This involves killing the cancer cells or shrinking the tumors using high energy rays like x-rays. Radioactive materials can also be used (brachytherapy). The side effects include fatigue, diarrhea, nausea and vomiting, weakened bones, among others.

Hormone therapy

This involves the use of hormones or administering hormone-blocking drugs. They include Progestins, Tamoxifen, GNRH agonists, and Aromatase inhibitors.

Uterine Sarcoma

This is the cancer of the muscles and the supporting tissues of uterus. They are of three types: endometrial stromal sarcomas, which develop in the stroma of endometrium; uterine leiomyosarcomas (LMS), which start in the myometrium; and undifferentiated sarcomas (ACS 2011).

Risk factors

Some of the risk factors are race and pelvic radiation therapy. Uterine sarcoma is twice as common in African-American as in Asian women or pure whites. Pelvic radiation increases the risk for developing the disease.

Symptoms and diagnosis

The possibility of uterine cancer is based on the symptoms. One or more tests are used to make the diagnosis. The symptoms are: abnormal bleeding or spotting, vaginal discharge, pelvic pain, and a mass (tumor) that’s felt. Just as endometrial cancer, tissue samples are removed and tested. The removal procedure is the same. The cancer type and grade are then obtained. The cells can also be tested for estrogen receptors and the progesterone receptors. This helps in predicting the type of drugs for the treatment. The imaging tests include transvaginal ultrasound, CT or CAT scan, MRI scans, PET scan, and Chest x-ray (ACS 2011).

Treatment and prognosis

The four basic treatments are surgery, chemotherapy, radiation treatment, and hormone treatment.

Cervical Cancer

This type of cancer begins in the cervix and spreads to the body of the uterus. Most cervical cancers start in the cells lining the cervix (ACS 2012a). The normal cells first develop into cervical pre-cancers which further develop into cervical cancers. They are of two types: squamous cell carcinoma and adenocarcinoma. Squamous cell carcinomas form about 80% to 90%.

Risk factors

Cervical cancer risk increases with human papilloma virus (HPV) infection, smoking, immunosuppression through human immunodeficiency virus (HIV), chlamydia infection, diets low in fruits and vegetables, use of oral contraceptives or birth control pills, multiple full-term pregnancies, poverty, and cervical cancer in the family history.

Symptoms and diagnosis

There are no symptoms during the early stages. After the cancer becomes invasive and extends into the nearby tissues, the symptoms begin to appear. They are: abnormal vaginal bleeding, unusual vaginal discharge, and pain during intercourse (ACS 2012a).

Physical examination, a pelvic examination, and a Pap test are then carried out. Pap test is mainly for screening. Other tests include colposcopy and cervical biopsies. Diagnostic tests are: cystoscopy, proctoscopy, examination under anesthesia, and imaging studies.

The treatments are surgery, chemotherapy, radiation treatment, and hormone treatment.

Current state of affairs and the future developments

The damage to DNA is what causes cancer cells. In a normal cell, a damaged DNA either gets repaired or the cell dies. However, in cancer cells, the DNA is not repaired and the cell doesn’t die. Instead, the cell continues to make more new cells that are not required by the body. All the new cells have the same damaged DNA. The damaged DNA can be inherited; however, most of the DNA damages occur when the normal cell is reproducing or due to the environmental factors.

In future, the tests for DNA changes are expected to help in finding cancers early and predicting how the cancer is likely to spread. This would help in deciding the best treatment for every victim. The main goal of this research is to find a gene therapy that can perfectly correct the DNA defects which causes the normal cells to become cancer cells. The current research is focused into new drugs, combination of drugs, or targeted therapies that can treat individuals with advanced cancer. Also being studied is the treatment with chemo after surgery, with or without the radiation treatment.

Works Cited

American Cancer Society (ACS). Cervical Cancer. 2012a. Web. July 28, 2012. http://www. cancer. org/acs/groups/cid/documents/webcontent/003094-pdf. pdf

American Cancer Society (ACS). Endometrial (Uterine) Cancer. 2012b. Web. July 28, 2012. http://www. cancer. org/acs/groups/cid/documents/webcontent/003097-pdf. pdf

American Cancer Society (ACS). Uterine Sarcoma. 2011. Web. July 28, 2012.

Centers for Disease Control and Prevention (CDC). Uterine Cancer. 2010. Web. July 28, 2012. http://www. cdc. gov/cancer/uterine/pdf/Uterine_FS_0510. pdf