N

*ASSIGNMENT 2*

ICS 2240

LOVE NALISI HSB214-0469/2022

RUTH OKATCH HBS214-0478/2022

REBECA SIPILINA HSB214-0510/2022

SOBMS

MEDICAL BIOCHEMISTRY

**LEUKEMIA**

**ABSTRACT**

The mutations are genetic but not hereditary. This means that leukemia is caused by mutations in one’s genes, these genetic abnormalities are not often inherited from your family. It’s called acquired gene mutations. It’s not always known what causes leukemia but one maybe genetically predisposed to developing leukemia, but lifestyle risk factors, such as cigarette smoking can also make you more likely develop leukemia. Other environmental factors such as exposure to certain chemicals and radiation, could also be behind the DNA abnormalities that can cause leukemia.

**THE DIFFERENCE BETWEEN A GENETIC DISEASE AND A HEREDITARY DISEASE.**

**GENETIC DISEASE**

A genetic disease isn’t always one that is passed down in one’s family. A genetic disease is any medical condition caused by a DNA abnormality, whether it’s inherited or acquired. This DNA abnormality is caused by a mutation in one gene o multiple genes. The mutations can take place during your lifetime as errors occur in cell reproduction. They can also be caused by environmental factors including exposure to radiations or certain chemicals.

**HEREDITARY DISEASE**

A hereditary disease is a type of genetic disease in which the gene mutations are inherited from one’s family. The gene mutations are present in the egg or sperm or egg and cause the disease to be passed from aren’t to children. Some examples of hereditary diseases are **hemophilia, sickle cell anemia and muscular dystrophies**. It’s very rare for these types of hereditary diseases to appear in someone with no family history of them.

There are some types of hereditary cancers for example, breast, ovarian, colorectal and prostate cancers have hereditary elements that may put families at risk.

**WHAT CAUSES LEUKEMIA ?**

Leukemia starts when the DNA of a single cell in the bone marrow changes or mutates. DNA is the” instruction code” that tells a cell when to grow, how to develop and when to die. Because of mutation or coding error, leukemia cells keep multiplying. All cells arising from the original mutated cell also have the mutated DNA.

**GENETIC AND ENVIRONMENTAL RISK FACTORS FOR LEUKEMIA**

A risk factor is some element about you, your genetics or your environment that can make you more likely to develop a disease. Disease risk factors aren’t the same as disease causes. Having a risk factor means that you have an increased chance of developing the disease, but you may not get the disease even if you meet the risk factors.

For example, age is often listed as a risk factor for various diseases. Aging itself isn’t the cause of the disease, what makes it a risk factor is that the disease is seen more often in older adults.

Leukemia has slightly different risk factors depending on the type. The four types of leukemia are:

1. Acute myeloid leukemia [AML]
2. Acute lymphocytic leukemia [ALL]
3. Chronic myelogenous leukemia [CML]
4. Chronic lymphocytic leukemia [CLL]

**Risk factors that make you more likely to develop one of the four types of leukemia**

**Genetic disorders**

Having certain genetic disorders can increase your risk of developing AML and ALL. These conditions include:

1. Klinefelter’s syndrome
2. Down syndrome
   * 1. TYPE 1
     2. TYPE 2
3. Fanconi anemia
4. Li-Fraumeni syndrome
5. Bloom syndrome

* Neurofibromatosis

**Smoking**

This lifestyle related factor can increase your risk of AML. This is one of the few things you can change to help reduce your risk of leukemia.

**Blood disorders**

Certain blood disorders can also put you at risk of developing AML. These include:

* Myelodysplasia
* Polycythemia vera
* Primary thrombocythemia

**Exposure to certain chemicals**

Frequent exposure to certain chemicals increases the risk of AML, ALL and CLL. One of the main chemicals that has been linked to leukemia is benzene which is found in:

* Gasoline
* Oil refineries
* Shoe manufacturing plants
* The rubber industry
* Chemical plants

**Previous cancer treatments**

Radiation is a risk factor for AML, ALL and CML. This means that people who have gone through cancer radiation treatments have an increased risk of leukemia. Previous cancer treatment with certain chemotherapy drugs is also a risk factor for leukemia.

These drugs include:

* Alkylating agents
* Platinum agents
* Topoisomerase II inhibitors

**Age**

The risk of developing AML and CLL increases with age.

**Gender**

Men are slightly more likely than women to develop leukemia.

**Race**

Researchers have found out that certain groups of people are more likely to develop certain types of leukemia. For example, people of the European descent have an increased risk of CLL. They have also found out that leukemia is rare in the people of Asian descent. These different risks are likely due to different genetic predispositions.

**Family history**

Leukemia is generally not considered a hereditary disease. However, having a close family member with leukemia increases your risk of chronic lymphocytic leukemia. CLL does occur more often in people who have a close family member who also had leukemia. Close family members are medically defined as your first -degree family, meaning your father, mother and siblings.

|  |  |  |
| --- | --- | --- |
| ITEM | QUANTITY | PRICE |
| beakers | 50 | 5000 |
| thermometer | 25 | 3000 |
| Conical flask | 10 | 4000 |
| Pipette | 45 | 2300 |
| syringe | 76 | 3456 |
| TOTAL |  | 78924 |

CH4 Methane

HCOOH or HCO2H Methanoic acid