

The effects of Leukemia and Current treatments for the Cancer.

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Leukemia a malignant cancer that affects the blood and bone marrow of a human. This fatal cancer can be diagnosed at any age and at any time it affects individuals differently die to age and body conditions. With multiple treatment options available leukemia survival rates has risen. Though it is common leukemia can be misdiagnosed which have led to multiple misdiagnosed deaths. Leukemia has become a common cancer worldwide and this is due to the exposure of chemical and radiation which are the two most leading factors for causing leukemia and acute leukemia. Through the help of modern technology, it has help us understand how Leukemia effects the body and what factors into getting leukemia with understanding how leukemia works and how to treat the disease it can increase the survival rate of people who has leukemia.

Introduction

Cancer a disease that has become a global problem rising mortality rate around the world. Though there are many types of cancer one of the most common cancers is Leukemia. Leukemia was first discovered. In 1811 when Peter Cullen had a case of having “unexplained Milky blood.” It was not until 1825 Alfred Velpeau found pus in the blood vessels of Peter Cullen which confirmed that it was leukemia. Overtime as Leukemia become more common modern medicine was made to counter this certain cancer drastically changing the survival rate of leukemia. This certain cancer starts in the bone marrow, which then it can start to spread rapidly into the blood causing it to spread into other parts of the body such as the: liver, spleen, lymph nodes, Central nervous system (CNS), and other

important organs. Overall, affecting the bone marrow and the lymphatic system. Commonly leukemia affects white blood cells. These cells are a part of the immune system these are used to fight off infections and other diseases. The usual life expectancy for leukemia is five years for people aged twenty or older they have a forty percent chance of survival for people under the age of twenty it is eighty-nine percent. However, survival rates depend on different factors such as biologic features of the disease, their body condition, and their age. For instance, people affected with CLL (Chronic lymphocytic leukemia) this disease affects the B cells which then changes the life expectancy from five years to ten or even twenty years. As of now there is no “main factor” as to why people can get leukemia though there are possible factors such as certain

chemicals such as benzene and intense radiation. The current treatments for leukemia are chemotherapy, targeted therapy, radiation therapy, bone marrow transplant, immunotherapy, engineering immune cells to fight leukemia, and clinical trials. There are also different kinds of leukemia that can be diagnosed Acute lymphocytic leukemia, Chronic lymphatic leukemia, chronic myeloid, and acute myeloid currently there only four different types of leukemia that can be diagnosed onto a person. All of these types of leukemia has way to treat them though one is not curable which Chronic lymphatic leukemia as of now there is no possible way to cure this type of leukemia. For the other three types of leukemia there are various ways to try and cure them. For chronic it is diagnosed when there is slow progression of the cancer to stop it from reaching an advanced phase. To counter this disease there is a tablet that has been made to attack the cancerous cells in the blood stream. For acute myeloid it also has the same type of treatment as acute lymphatic leukemia which usually include chemotherapy, and sometimes a targeted therapy drug.

Recent Progress

A type of immunotherapy CAR T- cell therapy uses your own immune cells to fight cancer. Though it can not be used to fight all cancer it is mainly used to fight blood type cancers. How it works is by collecting T cells from the blood and sending them to a specialized facility. Then the T cells will be converted to CAR T cells. After this step the CAR T cells will be injected back into your blood. As of right now this is the most recent progress on Leukemia. The CAR T cells will kill tumor cells by enabling T cells to bind to the targeted cell surface antigen by going through a certain single chain variable. When it has located that antigen the CAR T cells will form a non- classical immune synapse which is required for their effector function. These certain cells are able to mediate their killing of tumoral effects through the perforin and granzyme axis, the fas and fas ligand axis they also release cytokines to

sensitize the tumor stroma. Their performance high depends on receptor's individual components which are: scFv, spacer domain, and costimulatory domains. As of now there are currently five generations of CAR T cells the first generation contains three immune- tyrosine motifs. Which contains the TCR CD3zeta chain this first-generation chain can only deliver a potent signal 1. The way signaling works is by a specific lymphocyte protein tyrosine kinase. Soon there are more efforts into improving the CAR T cells this then led to the rise of the second generation and third generation of CAR T cells these two generations incorporate signaling endo domains CD28, and CD137 and a inducible T cell co-simulator (ICOS). For the Fourth and fifth generation CAR T cells include signaling domains from cytokine receptors. Another treatment that is used for Leukemia is Chemotherapy this certain therapy targets the fast growing cells through the body and kills them. The downside to Chemotherapy is that it also kills the normal and healthy cells. The number of rounds needed to finish chemotherapy for leukemia is six or more injections depending on how serious the cancer has gotten. Chemotherapy is effective for Leukemia since it nowadays about ninety percent of people who had been diagnosed with leukemia had recovered from leukemia. Although chemotherapy can be used to cure leukemia it can only be used to cure Acute lymphocytic leukemia. Chemotherapy is usually done before getting any kind of blood, or stem cell transplant. The reasoning behind this is because getting stem cells is harder than to do chemotherapy because it usually involved another human. Another different treatment is using stem cells this certain process replaces the damaged blood cells with healthy ones this process also require matches from a healthy individual who has a close match to the patient trying to receive the stem cells from the healthy individual the match that is needed is comes from what race they are it will also need to be a high percent rate in order for the stem cells to be effective as different races can result in lower

chances of stem cells working for the patient. As of now the survival rate for stem cell transplant is at 50-65% this number is quite high for the chances of survival. Which is not as serious as Chronic lymphocytic leukemia which as of currently does not have any possible way of recovering from it though it can be only rarely cured it is still a rare case to be cured people can live with CLL for many years without treatment but, overtime they will need treatment for the disease. The life expectancy of this leukemia can range from 2-10 years though if it is terminal it can last up to only 1-2 years this certain disease of leukemia has no cure nor no treatment for it currently which is why it is not possible to cure this kind of leukemia.

Discussion

The treatments for leukemia has been evolving overtime which as also led to an increase of surviving this certain cancerous disease.

Though modern medicine leukemia has been observed and easily now can be cured of though in certain results it can also lead to failure due to mis diagnosing and having CLL an incurable leukemia variant this certain leukemia stage can not be cured as of now. Though there are rare cases of it being cured it is very rare to be cured the only thing that is viable is treatment to attempt to cure the cancer. Unlike ALL (Acute Lymphocytic Leukemia) it can be cured using various kinds of treatments available now such as the ones that was mentioned in recent progress there are multiple treatments that had been made to try and help with getting rid with this cancer disorder. Though it can be cured does not mean that it will fail too there are chances of the treatments not working and not having a successful chance of curing the patient. That is why there are so many different kind s of treatments available for cancer. Though there are older ways to treat the cancer there are different ways to treat the

cancer now with more different types of treatments to successfully get rid of the cancerous disease this it will most likely keep improving upon itself and eventually become more successful at curing the disease. Currently Chemotherapy is the first treatment in line to fight against cancer which uses drugs to fight against the cancer cells. The biggest downside about chemotherapy is that it has many side effects: such as nausea, fatigue, hair loss, and risk of infection. Next is radiation therapy. This treatment involves using high-energy radiation, but the problem with this treatment is that the patient is meeting radiation. Bone marrow transplant is a procedure to replace the bone marrow stem cells with healthy ones. This kind of treatment can be helpful with certain types of leukemia which can help patients restore normal blood cell production. Targeted therapy uses drugs to target cancer cells without harming healthy cells these drugs block specific proteins that are used for growth and survival of cancer cells. Immunotherapy is a new treatment on the rise for leukemia. This involves using the body to fight back against cancer cells. This certain procedure can stimulate the immune system to attack cancer cells. Overall, leukemia is a dangerous cancer and there are still new treatments out there that are still being tested to fight back against this cancer.

References

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