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ACUTE MYELOID LEUKEMIA

UNDERSTANDING AML

Acute myeloid leukemia (AML) is a blood cancer that begins in the bone marrow, which produces most of the body's new blood stem cells.[1] There, the stem cells develop into myeloid or lymphoid cells.[1] Normally, myeloid stem cells mature into white blood cells (that fight infection) and lymphoid stem cells into red blood cells (that carry oxygen), white blood cells and platelets (that enable clotting).[1] In AML, myeloid stem cells do not mature properly, becoming abnormal white blood cells called myeloblasts.[1] Lymphoid stem cells may produce unhealthy red blood cells and platelets, also called blasts or leukemia cells.[1] These abnormal cells crowd out healthy ones in the bone marrow, resulting in infections, anemia, and bleeding.[1] They also move aggressively into the bloodstream to spread cancer to other parts of the body, such as the lymph nodes, liver, spleen, central nervous system (brain and spinal cord) and testicles.[2]

AML is labeled "acute" because it is an aggressive disease that can quickly become life-threatening if left untreated.[1] AML is classified based on the origin of the disease.[3] De-novo (primary) AML develops without an identifiable antecedent myeloid malignancy or previous exposure to chemotherapy or radiotherapy.[3] Secondary or high-risk AML, includes therapy-related AML (t-AML), which evolves from prior blood disorders or treatment with chemotherapy or radiation, and AML with myelodysplasia-related changes (AML-MRC).[3] Patients with high-risk AML may have a particularly poor prognosis.[4]

IMPACT OF AML

AML is a relatively rare disease representing 1.3 percent of all new cancer cases.[5] The median age at diagnosis is 68 years old[5] with rising age resulting in progressive worsening of prognosis.[6]

Risk factors may include cigarette smoking, past chemotherapy or radiation treatment/exposure.[1] Males are at a slightly higher risk, as are those with a history of blood disorders, such as childhood acute lymphoblastic leukemia and myelodysplastic syndrome.[1]

- **AML is the most common of all acute adult leukemias.[1]**
- **In the United States, it is estimated that**
  - **More than 21,000 people will be diagnosed with AML in 2017.[7]**
  - **More than 10,000 people die annually from AML.[7]**
    - **> As people age, there is a reduced tolerance for intensive chemotherapy.[8]**
    - **> Older people, aged 65-70 years old, account for 70 percent of AML deaths.[5]**
- **AML has the lowest survival rate compared to other types of leukemia.[5]**
- **The average five-year survival rate is 26.9 percent.[5]**

SYMPTOMS

The most common symptoms of AML include fever, fatigue, night sweats, loss of appetite and weight loss.[9] Individuals may also experience symptoms related to the decrease in healthy blood cells, such as:[9]

Symptoms of anemia
Frequent infections
Easy and common bruising or bleeding

DIAGNOSIS

Symptoms of AML can be similar to other common conditions, such as the flu, so a physical examination and medical tests are required to accurately diagnosis the disease.

- **A medical history and physical examination provide a physician with detailed information about symptoms, risk factors and signs of infection.[10]**
- **Cells from the blood and bone marrow are taken and reviewed to detect further abnormalities.[10] This is done using blood taken from a patient's arm and bone marrow from the hip bone.[10]**

PROGNOSIS AND TREATMENT

Prognosis is dependent upon several factors, including subtype of AML, age and other chronic medical conditions.

Age and fitness help determine the best course of treatment. A physician will determine whether a patient is "fit" to receive therapy. Recent advances in supportive care, intensive chemotherapy and bone marrow transplantation have primarily benefitted younger patients.[11] However, for older patients, the five-year survival rate has not improved.[11]

Most patients begin treatment, which is delivered in two phases, immediately following their diagnosis. Currently, the most common treatment is chemotherapy.

- ***The first phase is induction therapy,* which aims to eliminate AML from the blood and bone marrow to attain remission.[12] This treatment is nearly always performed inpatient in a hospital. If a partial response is achieved, a patient may receive a second induction therapy.**
- ***The second phase is consolidation therapy,* which aims to eliminate any inactive AML so there is no relapse of disease.[12]**

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