Acute myeloid leukemia (AML)

Illustrations

Acute myelocytic leukemia - microscopic view

Acute myelomonocytic leukemia - microscopic view

Auer rods

Acute Monocytic Leukemia - Skin

Blood cells

Alternative names *Return to top*

Acute myeloid leukemia (AML); Acute granulocytic leukemia; Acute nonlymphocytic leukemia (ANLL)

Definition *Return to top*

Acute myelogenous leukemia involves a malignancy (cancer) of blood-forming tissues of the bone marrow characterized by the proliferation of immature white blood cells. There are 8 categories of AML, categorized as M0 to M7, based on which blood cells are abnormal.

Causes, incidence, and risk factors *Return to top*

Acute myelogenous leukemia (AML) may occur at any age, but it primarily affects adults and children younger than one year old. This discussion focuses on AML in adults. In this condition, certain blood cells of the immune system, which are grown in the bone marrow, lose their ability to mature and specialize (differentiate). These cells multiply rapidly and replace normal blood cells.

Bone marrow failure occurs as malignant cells replace normal bone marrow elements. The person becomes susceptible to bleeding and infection as the normal blood cells lose their ability to fight microorganisms and decrease in number.

Most cases have no apparent cause. However, radiation, some toxins such as benzene, and some chemotherapy agents (including etoposide and drugs known as alkylating agents) are thought to cause some kinds of leukemia, including AML. Genetic abnormalities may also play a role in the development of this condition.

Risk factors include the following:

- exposure to radiation and chemicals
- immunosuppression following organ transplantation
- blood disorders such as the following:
    - polycythemia vera
    - essential thrombocythemia
    - refractory anemia

The incidence is 2.5 out of 100,000 people.

Symptoms Return to top

- Prolonged bleeding, bruising easily
- Gums, bleeding
- Epistaxis (bleeding from the nose)
- Menstrual periods, abnormal
- Skin rash or lesion
    - Pinpoint red spots (petechiae)
    - Bleeding into the skin
    - Bruises (ecchymoses)
- Fatigue
- Fever
- Bone pain or tenderness
- Weight loss
- Gums, swollen (rare)
- Shortness of breath aggravated by exercise
- Paleness

Signs and tests Return to top

A physical examination may show evidence of anemia, pallor and bleeding. Less commonly an enlarged spleen and liver or enlarged lymph nodes may be found..

- A WBC count can be high, low or normal.
- A CBC test shows anemia and low platelet count.
- A bone marrow aspiration shows evidence of leukemic cells.

Treatment Return to top

The objective of treatment is to eliminate the cancer cells with chemotherapy. Unfortunately, this process also eliminates normal cells that may be present in the bone marrow, so during treatment the patient is at risk from excessive bleeding caused by low numbers of platelets and infection caused by a low white blood count. It takes several weeks for the bone marrow to recover and start producing normal cells.

During this time supportive care is intensive. It consists of patient isolation to prevent infection, antibiotics to treat infection, transfusions of platelets to control bleeding and red blood cell transfusions to combat anemia.

After remission is achieved, further treatment is known as consolidation and is necessary in order to achieve a permanent cure. Consolidation may consist of either further chemotherapy, a bone marrow transplant or a stem cell transplant. These transplants may also be used in patients with relapsed disease.

Most of the different subtypes of AML have similar treatment. However, there are some differences in the treatment of one type of leukemia known as acute promyelocytic leukemia (APL). In this type of leukemia (and only this type), a medicine called all-trans retinoic acid (ATRA) is used to cause the leukemia cells to mature into normal white blood cellss.

ATRA is used during remission and consolidation treatments and has increased the cure rate for this type of AML. Additionally, the drug arsenic trioxide is approved for use in patients with APL who have failed treatment with ATRA or the usual chemotherapy. It can be used to achieve first remission or for later relapse.

Expectations (prognosis) Return to top

Complete remission occurs in 70% to 80% of patients. Overall, about 20% to 30% of people survive free of disease at 5 years from diagnosis. Patients who have not experienced a relapse during this time are considered permanently cured, since most relapses occur within 2 years of diagnosis. Patients who are less than 60 years of age have a better chance of survival than their older counterparts. This is related to many factors including the ability to tolerate the strong chemotherapy medicines. Without treatment, life expectancy is about 3 to 4 months.

Complications Return to top

- Relapse of the disease
- Severe infection
- Life-threatening bleeding