Acute Myeloid Leukaemia

Your doctor has told you that you have 'acute myeloid leukaemia' (AML).

'Leukaemia' means that tumour cells called blasts are present in your blood. In a healthy person these cells are responsible for the production of a type of white blood cells called polynuclears.

'Myeloid' refers to the bone marrow, that is the soft tissue located inside your bones which is responsible for the production of all types of blood cells. Indeed blasts accumulate in the bone marrow.

'Acute' means the disease has a sudden onset, the first symptoms and the diagnosis are a few days to a few weeks apart. Treatment is started within days, or even hours, of the diagnosis.

Medecin's notes :

As some drugs may make patients, especially males, sterile, it is possible to preserve some sperm after the disease is diagnosed.

Acute myeloid leukaemia is a form of cancer due to the uncontrolled multiplication of abnormal blasts within the bone marrow. The latter stops functioning normally and more especially stops producing normal blood cells. This is called bone marrow failure.

As a consequence anaemia (low red blood count) sets in, inducing fatigue, pallor, breathlessness and palpitations. Because other white blood cells called polynuclear neutrophiles (neutropenia) are fewer, the body is more sensitive to infections, especially lung infections. Lastly, the lower platelet count (thrombopenia) may cause bleeding, especially from the mucosa (nosebleeds, bleeding gums) and the skin (the slightest knock or blow may lead to haematomas or bruises).

The proliferation of blasts within the bone marrow may lead to other troubles : bone pains, enlarged lymph nodes and spleen. In rare cases the blasts may migrate to the cerebrospinal fluid, located in the skull and along the spinal column, thereby inducing damage to the nerves or the meninges.

However all these symptoms and troubles are not necessarily present.

AML may occur at any age, but only 25% of all cases are diagnosed before the age of 25 years. Its frequency rises mostly after 40 years and the average age at diagnosis is 65.

The cause of AML is most often unknown. In France ionising radiations and benzene exposure are considered as occupational hazards possibly inducing acute forms of leukaemia. Chemo- and radiotherapies for other cancers have also been held responsible. Lastly a history of other diseases, notably affecting the bone marrow (myelodysplasia), also predisposes to AML. This disorder is neither contagious nor hereditary.

Diagnosis

AML diagnosis mostly relies on a bone marrow aspirate (a myelogramme). It is performed under local anaesthesia and consists in inserting a hollow needle into a bone, usually either the breastbone or the bulging part of the hip. A small quantity of bone marrow is then removed to examine abnormal cells, their chromosomes and their genes. The information thus obtained is crucial to the choice of treatment.

Different types of AML

According to an international classification called the French-American-British (FAB) system there are eight distinct types of AML, designated M0 through M7, for example AML1 or AML 4. They mostly differ from one another by the characteristics of the abnormal cells seen in the myelogramme. This classification does not take the severity of the disease into account. Treatment is basically the same for all types of AML, except for some minor sub-types (AML3) which require more specific drugs.

Factsheets written by doctors of the French Society of Hematology (March 2009)
Traduit en anglais par le Département d'anglais de la Faculté de Médecine de Limoges

Acute Myeloid Leukaemia (suite)

Blood cells produced in the bone marrow

Three types of blood cells are produced in the bone marrow :

- **Red blood cells or erythrocytes** carry haemoglobin-bound oxygen to the body tissues. The haemoglobin rate best testifies to the number of red blood cells. It normally ranges between 12 and 16g/dl of blood in females and 13 to 17g/dl in males.
- **White blood cells or leucocytes** are necessary to fight infections. A normal white blood cell count ranges from 4 to 10 X 109, that is to say 400X109/l.
- **Platelets** allow blood to clot and prevent bleeding. Their range is from 150 to 400 X 109/l, that is to say 150000 to 400000/mm3.

How is treatment efficiency assessed?

AML treatment efficiency is assessed with the same investigations as those used to diagnose the disease: a myelogramme (examination of a bone marrow sample under a microscope) and a full blood count.

Remission is said to be 'full' when the bone marrow no longer has too many blasts and red and white blood cell counts and platelet counts are back to normal.

Participating in a clinical trial

The best way to contribute to the improvement of disease management is to treat patients in the context of clinical trial. If your doctor suggests this could apply to you, he will explain its purpose, protocol, expected benefits, potential risks and will give you an information leaflet.

Participating in a trial of course means you will first have to give your written informed consent.

Useful contacts:

- **Secretarial / appointment:**
- **Nursing consultation:**
- **Consulting psychologist:**
- **Social worker:**
- **In an emergency:**

Treatments

The treatment aims to eliminate all abnormal blasts so that the bone marrow can again produce normal blood cells (red and white blood cells, platelets). It usually consists of several phases:

- **Induction** consists in chemotherapy over seven to ten days. The aim is to obtain a remission, i.e. there is no visible evidence of disease, abnormal blasts are below detectable levels in the blood and the bone marrow and the bone marrow deficiency is cured. This treatment requires a one-month hospital stay so that the bone marrow can produce normal blood cells again. Once remission is achieved, doctors now know that a small number of abnormal cells persist in the bone marrow, making other treatments necessary.

- **Continuation or post-remission** therapy aims at a lasting remission and consists in administering high doses of chemotherapy. Several continuation therapy courses are usually required, calling for other hospital stays of various durations.

- **Intensification** is offered and adapted according to the relapse risk and varies from one person to another in order to achieve lasting remission and recovery. It rests either on several chemotherapy courses similar or very close to those administered during continuation or on a hematopoietic stem cell transplantation. This may be an allograft of donor cells or an autograft of the patient's own stem cells removed after the continuation treatment. Stem cells are blood cells (already present in placental blood) responsible for the production of all blood cells.
  Intensification can be considered for the under 65-70 year-olds as, over that age, the body can no longer put up with the adverse effects of such a treatment. Remission maintenance treatments can then be suggested according to the case.

The different treatments suggested lead to adverse effects, such as aplasia i.e. a much reduced rate of all blood cells. This is short-lived and lasts no longer than a few days to several weeks. During this period the patient's body cannot fight infection, often making hospitalisation in a sterile environment necessary. Information specific to other possible side-effects is given by the doctor before any treatment is started.

Supervision

Once all treatments are completed, supervision is essential. It requires regular visits you're your haematologist to detect any possible relapse and late complications of the treatment. Full blood counts have to be made at regular intervals first, then may be spaced out.

Acute leukaemia is not a disease with a bleak prognosis, recovery may be spoken of when the event-free period extends over several years.

Patients association → Fédération Leucémie Espoir
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