ERYTHROCYTOSIS

Erythrocytosis means "too many red blood cells"; as a result, the hematocrit and hemoglobin concentrations are elevated. Doctors may refer to this as *polycythemia*. Strictly speaking, this is not correct because polycythemia refers to high blood cell counts of all types - red, white, and platelets as well.

Erythrocytosis is not a disease; it is usually part of some other problem. There are no specific symptoms or physical signs although the underlying disease may cause the patient to seek medical help. Many times, the high hematocrit is noticed when a person has a blood count done as part of an exam for an unrelated complaint. If the red blood cell count gets very high the person affected may complain of increased warmth or headaches.

WHAT HAPPENS WHEN THE HEMATOCRIT IS HIGH?

First, the doctor must make sure it is a significant finding. When a hematocrit is measured, a sample of blood is taken to determine what percent of the sample are red cells and what percent is plasma. However, if something has caused the patient's plasma volume to drop (such as dehydration, certain medications or some types of high blood pressure), it may seem as if the number of red cells is increased, but really it is the amount of plasma that is decreased. This is called relative or spurious erythrocytosis. If any of these conditions exist, they may be corrected and the blood count repeated.

Once *relative erythrocytosis* is "ruled out", your doctor will have to do two things. One is to look for the underlying reason, and the second is to correct the erythrocytosis. On occasion, the doctor may do a red cell mass test to make sure the hematocrit is correct. This is a test done with a very small amount of radioactive material to show the total amount of red cells in the body.

WHAT ARE THE CAUSES OF ERYTHROCYTOSIS?

The many possible causes are divided into four major groups:

1. those that cause a low oxygen in the blood, therefore leading to an increase in erythropoietin secretion by the kidneys;
2. kidney diseases leading to high erythropoietin secretion;
3. benign and malignant tumors that produce erythropoietin;
4. a primary overproduction of red blood cells by the bone marrow called *polycythemia rubra vera.*

Conditions that cause low oxygen tension in the blood are common and, therefore, account for most of the cases of elevated red cells. The classic example of low oxygen is people who live at high altitudes where there is less oxygen in the air. The body senses this, leading to increased erythropoietin production and an elevated number of red cells to compensate for the low oxygen tension. Other conditions, such as chronic lung disease, certain heart defects, and sleep apnea syndrome, may lead to a low oxygen tension also. One of the most common causes is carbon monoxide intoxication as a result of heavy cigarette smoking. Therefore, as part of the evaluation of erythrocytosis, one needs to have blood oxygen and carbon monoxide levels done. In the case of kidney disease, a urinalysis and more specialized tests can be done.

The tumors that secrete erythropoietin are kidney, liver, uterine fibroids, and a few other rare tumors. Although rare, it is important that, if no other reason is found, a search be made for one of these since the tumor can be malignant and early detection may save the patient's life. There are some rare causes of erythrocytosis in which no good reason is uncovered for the erythrocytosis. For information regarding Polycythemia Rubra Vera please see the chapter on that subject.

WHAT HAPPENS WHEN A CAUSE IS FOUND?

When a problem is found, it can usually be corrected, and the erythrocytosis should go away. If there is not a correctable problem, then what happens depends on how high the hematocrit is. If the hematocrit is just a little above normal, perhaps nothing needs to be done. However, if the hematocrit gets too high (above 60 percent), it thickens the blood, causing circulatory difficulties that may result in strokes and heart problems.

CAN ANYTHING BE DONE TO PREVENT THESE COMPLICATIONS?

To avoid these problems, the patient can have *phlebotomies* (blood-letting) to reduce the hematocrit. A pint of blood can be removed every few days or once a week until the hematocrit is down and then done at intervals of time to keep it down.

IS PHLEBOTOMY LIKE DONATING BLOOD?

It is the same thing, but unfortunately most of the time others cannot use the blood because of the patient's disease and blood banking rules.

HOW DOES ERYTHROCYTOSIS AFFECT THE BLOOD VESSELS?

After a certain point, the higher the red count, the higher the viscosity of the blood. (So, instead of pumping water, it is like trying to pump syrup.) This increases the load on the heart. It can also lead to clumping of the cells with resulting strokes.