

Kidneys & Kidney Failure

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Kidney Failure & Anaemia

This booklet will help you to know in brief about kidneys and their functions, anaemia, general symptoms and causes of anaemia, causes of anaemia in kidney failure, and the kinds of treatment given in anaemia associated with kidney failure.

The kidneys are two bean-shaped organs located on either side of the vertebral column. They are capable of sustaining life independently. In other words, a person can lead a normal life even with one kidney. The organs of the urinary system are ureters, urinary bladder and urethra.

Kidneys are the chief excretory organs. The main function of the kidney is to excrete waste products. These wastes are produced due to the normal metabolic processes. If these wastes are not removed they can be harmful to the body.

They perform other important functions also which are balancing the body fluid, stimulating red blood cell (RBCs) production, controlling blood pressure and keeping bones healthy.

What is Anaemia?

Anaemia is a greek word, used to describe a lack of red blood cells in the body. Anaemia is not a disease. It is a sign, with its own symptoms, of some other disorder in the body, which is affecting blood.

Millions of red blood cells are made in the bone marrow each day. A constant new supply is needed to replace old cells that break down. Red blood cells contain a chemical called Haemoglobin (Hb) which carries oxygen from the lungs to all parts of the body. Anaemia means a reduced number of red blood cells or a reduced amount of Hb in each red blood cell.

Symptoms of Anaemia

The main symptoms of anaemia are:

1. Tiredness
2. Irritability
3. Lethargy
4. Pale skin
5. Shortness of breath
6. Poor appetite
7. Low sex drive

What are the causes of Anaemia ?

Causes of anaemia can be divided into four different types as follows:

- 1. Increased demand of Haemoglobin**
 - Pregnancy or childhood growth
 - Rheumatoid arthritis.
- 2. Loss of blood due to some reason**
 - Heavy menstrual periods
 - Bleeding from the intestines
- 3. Poor Intake of food**
 - Poor absorption of iron
 - Vitamin deficiencies
- 4. Miscellaneous**
 - Red blood cell problems such as thalassaemia, sickle cell and the haemolytic anaemia.
 - Bone marrow problems and leukaemia are uncommon but may cause anaemia.

What causes Anaemia in Kidney failure ?

To stimulate the production of red blood cells in the bone marrow by making a hormone called erythropoietin (EPO) is one of the important functions that kidneys do.

In kidney failure patients, because of the diminished efficiency of the kidney, the amount of EPO manufactured is less compared to a healthy individual. So the bone marrow makes fewer RBCs. As a result anaemia develops, and the patient becomes weak and tired.

Although lack of EPO is the main cause of anaemia, other factors can contribute to anaemia in people with kidney failure. These include the red blood cells not surviving as long in people with kidney failure and having to be replaced more frequently by the body, possible blood loss during haemodialysis treatment and frequent blood tests.

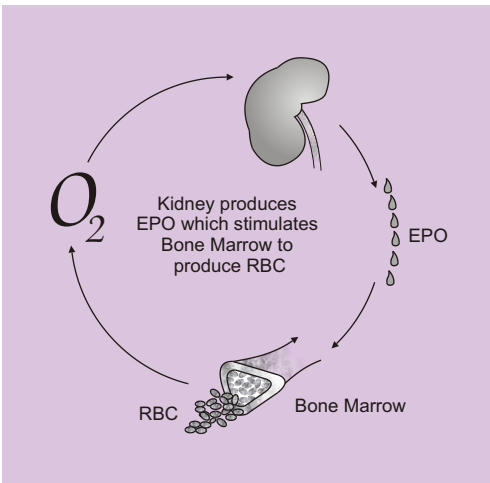
What is EPO?

EPO is one of the hormones manufactured by healthy kidneys. It stimulates the bone marrow to make red blood cells, which transport oxygen around the body. In kidney failure, the body cannot make its own EPO, and this leads to anaemia.

EPO is often prescribed, initially to correct anaemia, and sometimes (at a lower dose on an ongoing basis) to keep the red blood cell count up.

EPO first became available in the late 1980's. It is now made synthetically from human DNA - the human genetic code. It is mostly given in the form of an injection under the skin (subcutaneous), normally 2-3 times per week, but can also be given intravenously during haemodialysis. The aim of treatment is to raise the Hb level in the blood to between 10 and 12 g/100 ml.

The effectiveness of EPO depends on how much is given and general health of the patient, e.g., infection may reduce the effectiveness.



Treatment of anaemia in Kidney Failure patient.

If anaemia is caused by kidney failure, patient is treated with either EPO, an artificial form of the natural hormone or both EPO and iron supplement.

1. EPO

EPO is usually injected subcutaneously (under the skin) 2-3 times per week. Haemodialysis patients who can't tolerate EPO injections may receive the hormone intravenously during treatment, but this method requires a larger, more expensive dose, and may not be as effective.

50-100 units/kg is given 3 times a week, either by intravenous or subcutaneous route. It takes 2-8 weeks to have onset of effect of this drug.

2. Iron supplements

Many people with kidney disease need both EPO and iron supplements to raise their Hb to a satisfactory level. If iron levels are too low, then EPO won't help and patient will continue to experience the effects of anemia.

Iron may be given orally but iron pills may not work as well in people with kidney failure so iron is given intravenously. Iron is injected directly into an arm or into the tube that returns blood to the body during Haemodialysis.

Key words:

Anaemia, Haemoglobin, Erythropoietin

Please also refer the following information booklets from India Renal Foundation for more information.

1. Choosing Your Treatment
2. Haemodialysis
3. Peritoneal Dialysis
4. Kidney Transplantation
5. Diabetes and Kidney Failure
6. Hypertension and Kidney Failure
7. Kidney Stones and Kidney

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