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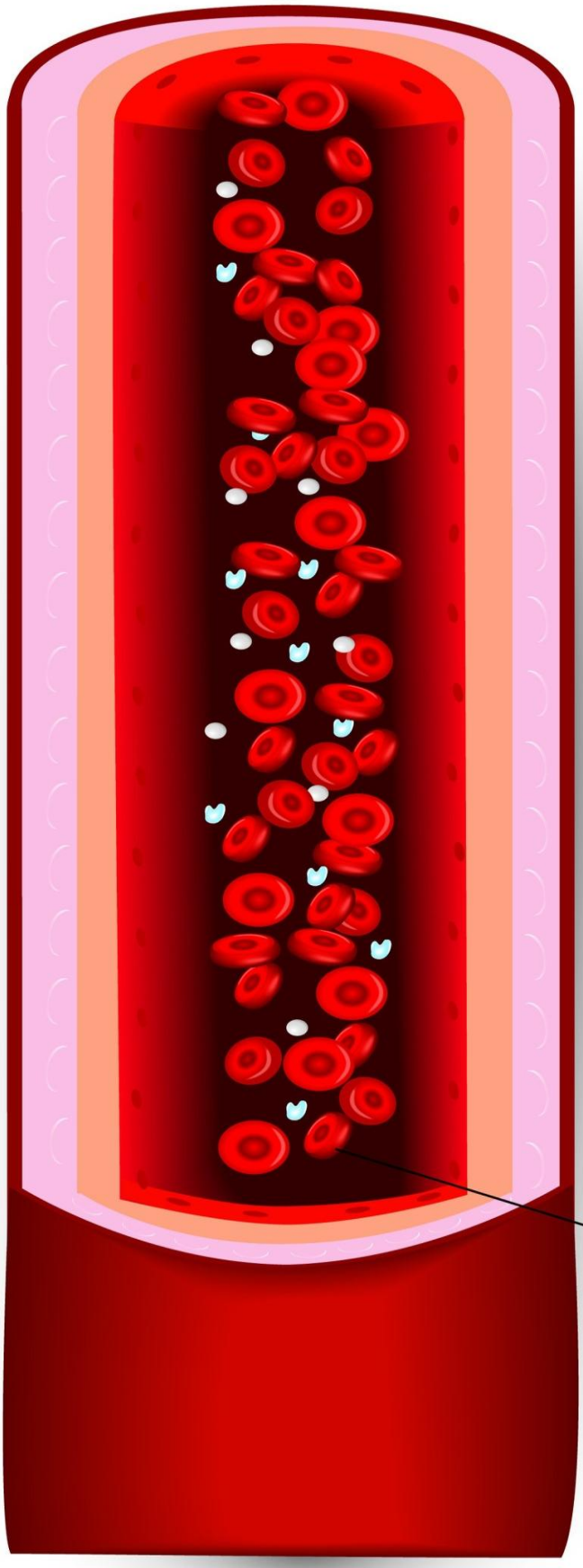
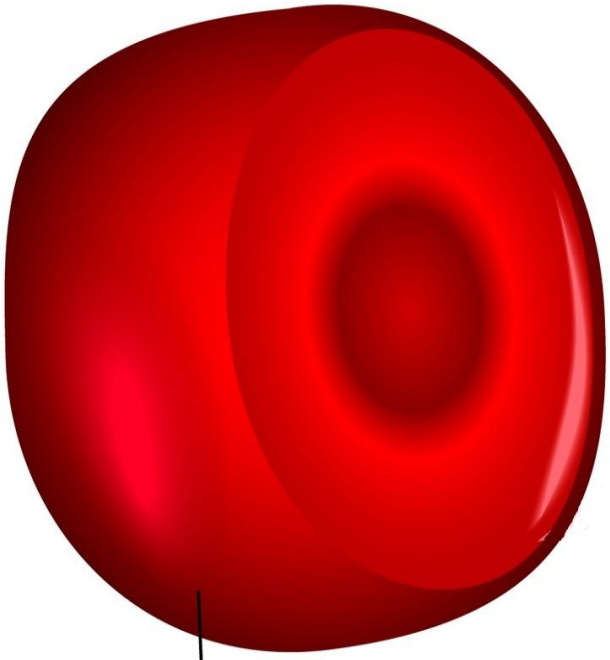


The Human Blood



Red blood cells

Welcome to the December edition of Sowkhya Magazine™.

In this month's serving of health related information, we have talked about blood. Our blood is a carrier of tremendous amounts of information that helps us as medical professionals understand what might be going on within your body. It provides nutrients and oxygen to vital organs. Blood tests are the most commonly performed medical investigation, primarily because it is helpful in diagnosing illnesses and also in ensuring that the treatment taken is effective.

Firstly, we have talked about your blood report, and what the different values mean. Blood reports can be confusing, and not understanding what each of the tests means can make some patients rather apprehensive. We have briefly discussed some of the common tests, particularly concentrating on what they mean and why they are performed.

In addition to this, we have interviewed an old friend of ours – Mr Platelet. He is one of the most important cells in our blood. We are sure you will be fascinated by the journey he goes through.

We have also spoken about bananas, and why we feel that this fruit is amongst the God of all fruits. Finally, as always, we have other little titbits of information that we hope will engage and inform you. Until next time (which will be 2015!), keep well and keep smiling!

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Understanding Your Blood Report

The human blood is amazing. It contains within it cells that perform specific functions, carries nutrients and oxygen to the vital organs, and can change dramatically during illness.

A laboratory report has a number of different parameters and values on it. You may see results such as haemoglobin, platelets, white cell count, creatinine etc. All this may sound like Greek and Latin to many, so this article aims to clear up what these blood results mean.

Red blood cells (RBC) - Red blood cells are small cells measuring 8 micrometers in diameter in the blood that are generated in the bone marrow. They are shaped like a doughnut, but without the hole in the centre. The number of RBCs in the blood range from 4.7 to 6 million cells per microliter.

Haemoglobin (Hb) – The haemoglobin is a protein molecule in red blood cells that is responsible for carrying oxygen to the vital organs. It is also responsible for maintaining the shape of red blood cells. Normal Hb is 12 to 15 grams per decilitre. In patients who have low iron levels, the red blood cells become pale and small. Combined with low haemoglobin, this is called microcytic (small cell) hypochromic (pale cell) anaemia. In patients with low vitamin B12, the cells are larger in size (called macrocytic anaemia).

White blood cells (WBC) – These cells are the defence system of the body. When the body is invaded by a bacteria or virus, the white blood cells start to fight them immediately. There are different kinds of white blood cells – neutrophils, lymphocytes, eosinophils, basophils and monocytes. Normal count ranges from 4000 to 11000 per cubic mm.

A high neutrophil count is seen in patients with bacterial infections. A high lymphocyte count (or sometimes a low count) can be seen in patients with a viral infection. A high eosinophil count is seen in patients who suffer from allergies and bronchial asthma. In rare cases, the individual cell counts might be very high – this is often an indication of problems with the bone marrow, and requires further investigation and treatment. Low counts of white blood cells can be seen in viral illnesses or disorders of the bone marrow (such as aplastic anemia).

Kidney function tests – The kidneys are responsible for filtering out impurities that are present in the blood. When blood flows through the kidneys, the toxins are removed and excreted out in the urine. Within the kidneys exists a complex set of 'exchange mechanisms' that are responsible for the movement of salts such as sodium and potassium. If the kidney function is altered for some reason, the values of the sodium and potassium can vary.

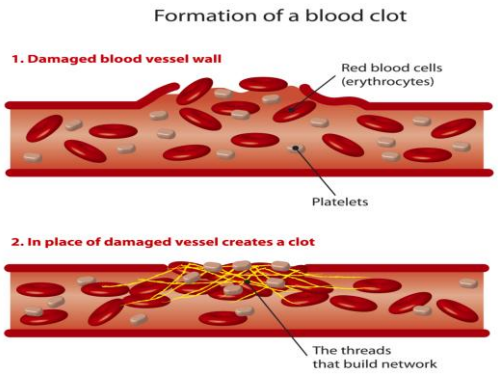
The serum creatinine is an indicator of the health of the kidneys. Creatinine is a waste product of creatine, which is a chemical in the blood that supplies energy to the muscles. Creatinine is excreted by the kidneys almost completely when healthy. However, if the kidney is not working well, the levels of creatinine rise in the blood, and this is reflected in the serum creatinine levels. Blood urea levels are also similarly elevated in patients who are dehydrated or who have kidney disease.

Liver function tests – The liver is an organ in the body that is responsible for producing enzymes and pigments that are essential for normal health. Liver function tests consist of enzyme testing (serum glutamic oxaloacetic transaminase – SGOT, serum glutamic pyruvic transaminase – SGPT, alkaline phosphatase) along with pigment testing (bilirubin). In patients with liver disease (such as hepatitis) and liver damage (from alcohol or drugs), the levels of these enzymes and pigments may be elevated. Bilirubin is a yellow pigment, and a high level of bilirubin in the blood is what causes jaundice.

Blood Sugar – This test is useful in the diagnosis of diabetes mellitus. Normal fasting levels range from 70 to 100 mg/dL, and postprandial levels are under 140 mg/dL. Anything above this is considered is abnormal. Fasting levels above 125 and postprandial above 200 mg/dL is indicative of diabetes mellitus.

Blood tests are an extremely useful way of detecting the function of vital organs in health and in disease.

Mr Platelet – My Story



We all dream of a life that is filled with joy and happiness – not just for ourselves, but for our children, friends and loved ones. While I would love to have a life that lasts years, unfortunately mine is short, filled with work, and at times - disastrous.

Hi there! My name is Plato, and I am a platelet. I thought I would tell you my story in brief, seems that I have become a point of interest in many blood tests these days.

My home

I live in the red liquid that flows in your blood vessels – blood.
I have millions of siblings, and so many friends that I can't even count them! My friends include red blood cells, white blood cells, muscle cells and many other pals that circulate in the blood stream. It is great being a part of a big family!

My parents

Unlike humans, I do not have 2 parents. I originate from a mini - galaxy in your body called the 'Bone Marrow', which is a soft and mushy tissue that is present within your bones. In fact, I am really not a cell, but a broken off part of the cytoplasm of a large cell called a megakaryocyte. Interestingly, I am only present in mammals.

My life and role in your body

Did you know that around 10,000 million of us are born every day? After we are born, we remain inactive for quite some time. I float around without purpose in the blood stream, waiting to be called into action. If you were to find me in your blood, you would realise that I look like a squeezed ball, only very tiny. I only measure 2 – 3 micrometers in diameter, and am completely invisible to the naked eye.

That being said, I can be easily seen under a microscope, making it hard for me to hide from the eyes of a pathologist! I appear dark purple under the microscope, and am a lot smaller than my friend - the red blood cell.

My role in your blood is only one – to stop bleeding when you cut or injure yourself. When there is damage to the blood vessel wall, my friend the endothelial cell (he lives on the blood vessel wall) sends out mystical signals to me, calling me for help. Like a hero in a Bollywood film, I rush to his rescue, taking with me my full power of stopping bleeding when it happens. I stick on to the endothelial cell, and am quickly followed by my siblings who latch onto me. Soon, we form a clump of platelets and help to plug the hole through which the blood was oozing out.

At the same time that we are in action, other friends of mine help form a tight net of tissue (called fibrin) that reinforces our strength at stopping the bleeding. Together we form a blood clot. All this, you may not believe, takes between 2 to 6 minutes only!

By the way, unlike humans who live for years, I only live for 8 to 9 days. I am ultimately transported to the spleen or liver, where I am laid to rest.

My darker side

Right, I want to say that while most of us platelets are good blood cells, there are a few of us that are bad. Yes, we too have angels and devils amongst our midst.

But the fact of the matter is that we are not born bad. We are made bad because of certain bad habits that humans develop over the years. Smoking, high body weight, poor diet, diabetes, high blood pressure and lack of exercise make us lose our good nature and turn us into cells that cause more harm than good.

Here is the problem – my fellow bad platelets like to form blood clots within the heart arteries sometimes. This is because these arteries are damaged from the previously mentioned habits and risk factors. When they form clumps within the arteries, they can block the circulation to the heart, leading to a heart attack. Similarly, these bad platelets can form clots within the brain, leading to a stroke. The whole purpose of these bad platelet clumps is to block the circulation of healthy blood to the vital tissues. Fortunately, medicines like Aspirin, Clopidogrel and Prasugrel stop me from sticking to my friends, and prevent me from forming blood clots.

Many of my qualities are inherited. What this means that if you have a family history of heart attacks, then it is likely that I too will turn to the dark side and be responsible for the heart attack in you. So what can you do to stop this? Well, make sure you maintain a healthy body weight, eat healthy and exercise regularly. Do not smoke and please refrain from alcohol. I request you sincerely not to force me along the wrong path, but keep me on the right path by looking after yourself.

My new enemies

Even when I am healthy and playing a good role, there are certain people that like to destroy my friends and I. Take dengue fever virus for example. This condition is well known to reduce the number of platelets in the blood. It destroys my friends even though we do our best to fight it. Of course, we rely on the human body to start a battle against the virus, and along with medicines we ultimately prevail. This can take a few days.

My new found fame

I have been in the news a lot lately. For some reason, everyone wants to know more about me! This is because there are certain illnesses where my numbers go down drastically leading to bleeding from the nose, gums, eyes and skin. In some cases, people with these illnesses may need new platelets transfused. Sadly, there are no medicines available to increase my number substantially when in need. Papaya leaf juice seems to increase my numbers somehow.

SO THIS IS MY STORY. I HOPE YOU ENJOYED GETTING TO KNOW ME BETTER!! TAKE CARE OF ME, AND I WILL TAKE CARE OF YOU! LOVE TO YOU ALL!

Your Blood Group – Get the Facts

There may come a time in your life when you either have to donate your blood or receive a blood transfusion. The first question asked in such situations is 'what is your blood group?'

Many of us are aware of our blood groups, but not all of us know what each group means. This article should give you a brief review on the different types of blood groups and what they mean.

What are blood groups?

Our blood group is basically a description of the antigens and antibodies we have in the blood. On the surface of the red blood cell are present small proteins called antigens. Within the liquid component of the blood (called plasma) is present proteins called antibodies. Together, these form part of the defence system of the blood.

What are the types of blood groups?

The blood groups are described as a part of what is called the 'ABO' system. In this system there are 4 kinds of blood groups –

- Blood group **A** – Antigens to A but antibodies to B
- Blood group **B** - Antigens to B but antibodies to A
- Blood group **O** – No antigens, antibodies to AB
- Blood group **AB** – Antigens to A and B, no antibodies.

Another antigen that is present on the blood cells is the 'Rhesus' antigen, also called RhD antigen. When present, the blood is called 'positive', and when absent, it is called 'negative'. In other words, blood groups can be A+, A-, B+, B- and so on.

As people with blood group O have no antigens in the blood, they can donate their blood to anyone. O+ is the most common blood type, and is called the universal donor. On the other hand, AB has no antibodies, meaning they have no defence when they receive blood. People who have AB blood types are universal recipient. Blood group A can only be given to A or AB, and blood group B to B or AB.

Accidentally receiving the wrong blood type during transfusion can cause a serious reaction that needs immediate treatment.

Inheritance

We inherit our blood type from our parents. It is just like we inherit the colour of our hair and skin colour. The inheritance is complex and is unique. It is important to know your blood group should the emergency need ever arise.

10 Reasons Why You Should Be Eating Bananas

Bananas remain to this day one of the most commonly eaten fruits across the planet. They are easy to carry, hassle free to eat and taste great as well. But do you know what exactly bananas can do for your health? Here are 10 reasons why we believe you should be eating this wonderful fruit.

1. Bananas are a great source of energy. A single banana provides between 100 to 130 calories (pachbale, not elakki), making it a great fruit to eat if you are feeling weak and run down. It also has 1 gm of protein and is fat free.

2. Bananas contain tryptophan – a substance that can elevate mood and combat clinical depression.

3. A banana after a workout can provide essential nutrients to rebuild muscle and counteract loss of calcium. This makes both muscles and bones stronger.

4. Bananas are a rich source of fiber (3gm per serving), which can prevent constipation.

5. Bananas are rich in potassium, and help improve brain functioning and memory power.

6. Bananas are rich in iron. 1 serving has 0.3 mg of iron. This can help prevent anemia.

7. Bananas are a good source of B vitamins, which maintain normal functioning of vital organs.

8. Regular intake of bananas can help reduce the chance of developing heart disease.

9. Over-ripe bananas with a lot of brown spots on them are high in anti-oxidants. These are believed to fight cancer due to high content of tumor necrosis factor, a cancer fighting compound.

10. Banana peel is an excellent face mask.

These are just some reasons why bananas are super foods!

Why Is Our Blood Red?

Ever wonder why our blood is red in colour? Well, within our blood is present a protein called haemoglobin that is made of smaller units called 'heme'. Heme contains iron that can bind to oxygen. When it does so, the blood becomes red in colour due to the interaction between iron and oxygen. The chemical bonds reflect red light, which gives it the red colour.