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Class BS DT
SECTION. B
SUBJECT PHYSIOLOGY
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QUESTION NO 1

- Write the functions and composition of blood?



What is blood?

- Blood The familiar red fluid in the body that contains white and red blood cells, platelets, proteins, and other elements. The blood is transported throughout the body by the circulatory system. Blood functions in two directions: arterial and venous.



arterial and venous. Arterial blood is the means by which oxygen and nutrients are transported to tissues while venous blood is the means by which carbon dioxide and metabolic by-products are transported to the lungs and kidneys, respectively, for removal from the body.



Composition of blood

- Blood is classified as a connective tissue and consists of two main components:
- Plasma, which is a clear extracellular fluid
- Formed elements, which are made up of the blood cells and platelets
- The formed elements are so named because they are enclosed in a plasma membrane and have a definite structure and shape.



- All formed elements are cells except for the platelets, which are tiny fragments of bone marrow cells.
- Formed elements are
- Erythrocytes also known as red blood cells RBCs
- Leukocytes also known as white blood cells WBCs
- Platelets



From slides

- Liquid part of blood
- Pale yellow made up of,
- 92% water
- Mineral ions
- Glucose and nutrients
- Hormones
- CO₂
- Proteins



- **Plasma proteins**
- **Albumin...regulation of PH**
- **Globulin...defense**
- **Fibrinigen...blood clotting**



- **RBC**
- **WBC**
- **Platelet**
- **Erythrocytes**



Formed elements

- **RBC**
- Biconcave in shape
- Diameter = 7.8 micrometer
- Thickness = 2.5 micrometer
- 52,00,000/cubic millimeter of blood in males
- 47,00,000 in females



- **WBC**

- 7000 per microliter of blood
- 6 types of WBC
- Polymorphonuclear neutrophils 62%
- Polymorphonuclear eosinophils 2.3%
- Polymorphonuclear basophils 0.4%
- Monocytes 5.3%
- Lymphocytes 30%



- White blood cells WBCs are also known as leukocytes. They can be divided into granulocytes and agranulocytes. The former have cytoplasm that contains organelles that appear as coloured granules through light microscopy. Granulocytes consist of neutrophils, eosinophils and basophils. In contrast, agranulocytes do not contain granules. They consist of lymphocytes and monocytes.



Platelets

- 300,000 per microliter of blood
- Platelets also called thrombocytes
- Platelets are small fragments of bone marrow cells and are therefore not really classified as cells themselves



ERYTHROCYTES

- Red blood cells or erythrocyte are the most abundant types of cell
- Approximately 2.4 million new erythrocyte are produced per second.
- Approximately quarter of cells in the human body is red blood cells
- To pick up oxygen from the lungs and deliver it to tissues elsewhere
- To pick up carbon dioxide from other tissues and unload it in the lung



Erythrocyte structure

- In human mature blood cell are oval Biconcave disk and they are flexible
- In typically human erythrocyte has disk approximately diameter is 6.2-8.2
- The lack cell nucleus and more organelles in order to accommodate maximum space for haemoglobin



Function

- The primary function of blood is to deliver oxygen and nutrients to and remove wastes from the body cells
- but The specific functions of blood also include defense, distribution of heat, and maintenance of homeostasis.



Defence

- Many types of WBCs protect the body from external attacks such as disease-causing bacteria that have entered the bloodstream in a wound. Other WBCs seek out and destroy internal threats, such as cells with mutated DNA that could multiply to become cancerous, or body cells infected with viruses.



QUESTION NO 2

- . What is erythrocyte, erythropoiesis, erythrocytosis and erythropenia?



Erythrocyte

- Erythrocyte is basically red blood cells without nucleus
- Erythrocytes contain the pigment haemoglobin, which imparts the red colour to blood, and transport oxygen and carbon dioxide to and from the tissues.



- A type of blood cell that is made in the bone marrow and found in the blood. Erythrocytes contain a protein called hemoglobin, which carries oxygen from the lungs to all parts of the body. Checking the number of erythrocytes in the blood is usually part of a complete blood cell CBC test. It may be used to look for conditions such as anemia, dehydration, malnutrition, and leukemia. Also called RBC and red blood cell.



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Erythropoiesis

- The formation of red blood cells in blood-forming tissue. In the early development of a fetus, erythropoiesis takes place in the yolk sac, spleen, and liver. After birth, all erythropoiesis occurs in the bone marrow.



Erythrocytosis

- Erythrocytosis is increase in red blood cells mass. Erythrocytosis is a condition in which your body makes too many red blood cells (RBCs), or erythrocytes. RBCs carry oxygen to your organs and tissues. Having too many of these cells can make your blood thicker than normal and lead to blood clots and other complications



- There are two types of erythrocytosis
- **Primary erythrocytosis** This type is caused by a problem with cells in the bone marrow, where RBCs are produced. Primary erythrocytosis is sometimes inherited.
- **Secondary erythrocytosis.** A disease or the use of certain drugs can cause this type.



Erythropenia

- Erythropenia is the opposite of erythrocytosis because its deficiency of red blood cells in large amount
- This is the case of anemia



QUESTION NO 3

- What is platelets and write about clotting mechanism and its all steps?



PLATELETS

- also called thrombocytes are a component of blood whose function is to react to bleeding from blood vessel injury by clumping thereby initiating a blood clot. If one of your blood vessels gets damaged it sends out signals to the platelets. The platelets then rush to the site of damage. they form a plug clot to fix the damage.



Structure of platelets

- Platelets have no cell nucleus, they are fragments of cytoplasm that are derived from the megakaryocytes of the bone marrow, which then enter the circulation.
- circulating unactivated platelets are biconvex discoid (lens-shaped) structures 2–3 μm in diameter.
- Activated platelets have cell membrane projections covering their surface. Platelets are found only in mammals, whereas in other vertebrates (e.g. birds, amphibians) thrombocytes are there.



Life span

- In some books life span is 8 to 9 days but has 10 days in also in our slides there is 10 days so i think life span is 10 days

- **FUNCTION PLATELETS**

- Stop bleeding
- Maintain hemostasis
- Clotting mechanism



What is clothing mechanism

- Coagulation is known clothing.
- This the mechanism in which blood change from liquid to gel and forming a blood clot



When clotting mechanism initiated

- instantly after an injury to the blood vessel which has damaged the endothelium lining the vessel
- To stop bleeding, the body relies on the interaction of three processes



- **Primary hemostasis** involves the first two processes.
- 1 Vasoconstriction is the body's first response to injury in the vascular wall. When injury occurs, vessel walls constrict, causing reduced blood flow to the site of injury.



- **2. Platelet plug.** Platelets aggregate to the site of the injury. They stick together acting as a "plug." Platelets also activate the process which causes a fibrin clot to form, known as secondary hemostasis.



- **Secondary hemostasis.**

- 3. Platelets alone are not enough to secure the damage in the vessel wall. A clot must form at the site of injury. The formation of a clot depends upon several substances called clotting factors. These factors are designated by roman numerals I through XIII.



Mechanism involves

- Adhesion
- Activation
- and aggregation of platelets
- deposition and maturation of fibrin



Step of mechanism adhesion

1. Injury to the blood vessel
2. Endothelium lining the vessel damaged
3. Blood comes into space under endothelium
4. Underlying collagen exposed to circulating platelets
5. Platelets binds with surface receptors of collagen and adhere tightly
6. This is adhesion



Activation

1. platelets change shape
2. turn on receptors and secrete chemical messengers to activate and invite additional platelets
3. Activated platelets adhere tightly at injury site.



Aggregation

- Platelets connect to each other through receptor bridges
- Platelet plug formed at injury site unless the interruption is physically too large
- Aggregation involves platelet-to-platelet adhesion, and is necessary for effective hemostasis following the initial adhesion of platelets to the site of injury,



Fibrin deposition

- Formation of platelet plug will ensure primary hemostasis.
- Now fibrin deposition start and thus started secondary hemostasis.
- Thus fibrin clot formed.
- Now clot retraction and platelet inhibition.



QUESTION NO 4

- Q4. Write a note on ABO system?



ABO SYSTEM

- O 47%
- A 41%
- B 9%
- AB 3%



- By Dr. Karl Landsteiner 1900
- Inherited from parents
- Based on A and B antigens-Agglutinogens
- May have,
- Neither of them
- One of them
- Both of them



- ABO blood group system, the classification of human blood based on the inherited properties of red blood cells (erythrocytes) as determined by the presence or absence of the antigens A and B, which are carried on the surface of the red cells. Persons may thus have type A, type B, type O, or type AB blood



Agglutinogens and agglutinins

- Agglutinogens on surface of RBC
- Agglutinins in blood plasma
- Can cause blood transfusion reactions
- Agglutigen
- an antigenic substance present in blood cells, bacteria, etc., which stimulates the formation of an agglutinin in blood serum.
- Agglutinin
- an antibody, lectin, or other substance that causes agglutination.



Role of blood group in blood transfusion

- If mismatched then hemolysis
- Blood typing is mandatory
- We have to be careful for matching blood of its come to the blood tranfuse
- We have to tranfuse an accurate blood if we transfuse another type of played maybe the patient paid some thing for it may be he died from this kind of mistake



Blood Type	Antigen on Red Blood cells	Anti bodies in Plasma	can receive blood from	can donate blood to
(A)	(A)	(Anti B)	'O' and 'A'	(A and 'B')
(B)	(B)	(Anti A)	'O' and 'B'	B and AB
AB	(A and B)	(neither)	O, A, B, and AB	AB only
(O)	(neither)	(Anti A and Anti B)	O only	O, A, B, and AB



- 2. Complications of blood transfusion with reference to ABO and RH incompatibility



Complications of blood transfusion with reference to ABO incompatibility

- Mismatched blood e.g. anti-A plasma agglutinins exposed to RBC with A agglutinogen i.e. blood group A transfused to blood group B



- Agglutinins have binding sites ☒
Agglutinins attach themselves to RBC antigen ☒ agglutination ☒ hemolysis
- Acute hemolysis
- Jaundice
- Kidney shutdown



QUESTION NO 5 A

A person fell down from a tree and become unconscious, with bleeding from head, what will you do as a first aid?



- First of all i have to stop his bleeding with gause piece and clean it with pyodine then i will try to make him or to bring him into conscious state if he couldn't able to come into conscious state then i will try to drop some water on him
- If he is is extremely injured i will try to stertch he wounds then cut the wire with scissors. And use gause piece use pyodine and also bandages to bandaged his head
- And if he come into conscious state then i will pain give killer to him



• Treatment

- If he is serious so i will take him to hospital if he isn't so i will use pyodine gauze piece bandages for his wounds to stop bleeding and come into conscious state



QUESTION 5 B

- you have to meet with your friend and you came to me know he is covid positive, what precautionary measures will you take?



- If a person is covid-19 in inter to my house i will not shake a hand with him. i will tell him stay away from me even i will give him separate room to stay there for 14 days.
- Then i will tell him get a bath wash your hands with sanitizer and aslo with hot waters
- After i will tell him
- Then i will tell to give your blood for testin
- And give some medicines we don't have any specific medicines but if he is in a hightemperature i will give him panadol cf
- He should sta in touch withdoctors



- He should stay at if he will stay at he will save others life he won't stay will cause other to dead

-

- **Treatment**

- There no specific treatment for it but if he is staying in one place that would be better amd he will easily come into healthy life



THE END

Mam thank you so much i have learnt lots of thing
from this paper GOD bless you mam 😊😊



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