DENTAL SEC B PHYSIOLOGY, 2ND SEMESTER

MAM KOUSAR SHAH JEHAN

STUDENT NAME Imdadulah , ID:15713

Attempt all questions. Every question carry 10 marks.

Q1. Write the functions and composition of blood?

Answer:

Composition of blood

Blood consists of

- Plasma (volume-55-60%)
  Liquid part of blood
  Pale yellow made up of
  1: water (91-92%)
  2: solids (8-9%)(Mineral ions, Glucose and nutrients , Hormones, C02, proteins)
- Formed Elements (volume 40-45%)
  Cellular part(RBC, WBC,&platelets=40-45%)
  1: RBC
  - Biconcave in shape
  - Diaeter-7.8 micrometer
  - Thicknesss =2.5 micrometer
  - 52,00,000/cubic millimeter of blood in males
  - 47,00,000 in females

2: WBC

- 7000 per microliter of blood

6 types of WBC

- Polymorphonuclear neutrophils 62%
- Polymorphonuclear eosinophills 2.3%
- Polymorphonuclear basophils 0.4%
- Monocytes 5.3%
- Lymphocytes 30%

3: Platelets

- 300,000 per microliter of blood

Function of blood

1: Respiratory functions

Blood transport O_2 from lunges to tissues and CO_2 from tissues to lunges.

2: Nutritive function

It transport food (a) absorbed from GIT

3: Excretory function

It transport excretory metabolite end products from tissues to organs of excretion,

4: Carrier function

It carries hormones enzymes antibodies ,etc,

Q2. What is erythrocyte, erythropoiesis, erythrocytosis and erythropenia?

Answer:

Erythrocyte

- Red blood cells, or erythrocytes, are the most abundant type of blood cell.
- Approximately 2.4 million new erythrocytes are produced per second.
- Approximately a quarter of the cells in the human body are red blood cells.

Erythrocytes – Structure

- IN humans, mature red blood cells are oval biconcave disks and they are flexible.
- A typical human erythrocyte has a disk diameter of approximately 6.2-8.2 µm
- They lack a cell nucleus and most organelles, in order to accommodate maximum space for hemoglobin.

Erythropoiesis

- Erythropoiesis is the process by which red blood cells (erythrocytes) are produced.
- It is stimulated by decreased O2 in circulation, which is detected by the kidneys, which then secrete the hormone erythropoietin.
- The whole process lasts bout 7 days . though this process erythrocytes are continuously produced in the red bone marrow of large bones, at a rate of about 2 million per4 second in a healthy adult

Erythrocytosis (polychythemia)

- If the erythrocyte count is more than normal, such state is called erythrocytosis.

Erythrocytosis

Physiological

- Absolute
  -in high altitude
- Relative
  -Exercises

Pathological

- Primary
  - Bone marrow disorder
- Secondary
  - Due to any CV or respiratory disease.

Erythropenia

Physiological

- Absolute
  - Deficiency of production
- Relative
  - Pregnancy (RBC dissolves in fluid)

Pathological

- Primary
  - Bone marrow disorder
- Secondary
  - Due to any kidney disease.

Q3. What is platelets and write about clotting mechanism and its all steps?

Answer:

- 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.

Structure

- 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.

Life span

10 days

Function

- Stop bleeding
- Maintain hemostasis
- Clotting mechanism

What is clotting mechanism

- Coagulation/ clotting means blood changes from liquid to gel .

What is clotting mechanism initiated

- Instantly after an injury to the blood vessel which has damaged eth endothelium lining the vessel .
- Clotting mechanism stop bleeding from damaged vessels maintained hemostasis.

Steps 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 though receptor bridges.
- Platelet plug formed at injury site unless the interruption is physically too large.

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.

Q4. Write a note on ABO system?

ABO System

- The two most important ones are ABO and the RH antigen system, They determine someone's blood type (A,B.AB and O with +, -) or Null denoting RhD status. Rhesus (RH) factor is an inherited protein found on the surface of red blood cells. If your blood has the protein, you are Rh positive. If you are blood lacks the protein, your Rh negative.

ABO system

O 47%

A 41 %

B 9%

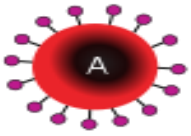
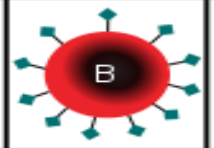
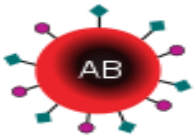
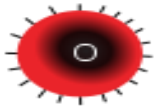
AB 3%

ABO system

- 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

Agglutinogens and agglutinins

  - Agglutinogens on surface of RBC
  - Agglutinins in blood plasma
  - Can cause blood transfusion reatcions

	Group A	Group B	Group AB	Group O
Red blood cell type				
Antibodies in plasma	 Anti-B	 Anti-A	None	 Anti-A and Anti-B
Antigens in red blood cell	A antigen	B antigen	 A and B antigens	None

Role of blood groups in blood transfusion

- If mismatched then hemolysis
- Blood typing is mandatory

Blood transfusions

RELATIONSHIPS BETWEEN BLOOD TYPES AND ANTIBODIES				
Blood Type	Antigens on Red Blood Cell	Can Donate Blood To	Antibodies in Serum	Can Recieve Blood From
A	A	A, AB	Anti-B	A, O
B	B	B, AB	Anti-A	B, O
AB	A and B	AB	None	AB, O
O	None	A, B, AB, O	Anti-A and Anti-B	O

Complication of blood transfusion with reference to ABO and RH 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

Q5.(i) A person fell down from a tree and become unconscious, with bleeding from head, what will you do as a first aid?

Answer:

Stopping the bleeding from a minor wound

- Before you try to stop the bleeding:

    - Wash your hands well with soap and water (if available).
    - If treating another person's wound, put on disposable gloves, if you have them, before applying pressure to the wound. If gloves are not available, use several layers of fabric or plastic bags between your hand and the wound. Use your bare hands to apply pressure only as a last resort.
- Have the person lie down.
- Remove any visible objects from the wound. Do not attempt to clean out the wound.
- Press firmly on the wound with gauze, a clean cloth, or the cleanest material available. If there is an object in the wound that you can't remove, apply pressure around the object, not directly over it.
- Apply steady pressure for a full 15 minutes. Use a clock to time the 15 minutes. Resist the urge to peek after a few minutes to see if bleeding has stopped. If blood soaks through the cloth, apply another one without lifting the first.
- If moderate to severe bleeding has not slowed or stopped, continue direct pressure while getting help. Do all you can to keep the wound clean and avoid further injury to the area.
- Mild bleeding usually stops on its own or slows to an ooze or trickle after 15 minutes of pressure. It may ooze or trickle for up to 45 minutes.
- Watch for signs of shock, which is a life-threatening situation that requires emergency care. Signs of shock (most of which will be present) include:
    - Passing out (losing consciousness).
    - Feeling very dizzy or light-headed, like you may pass out.
    - Feeling very weak or having trouble standing up.
    - Being less alert. You may suddenly be unable to respond to questions, or you may be confused, restless, or fearful.

(ii) you have to meet with your friend and you came to know he is covid positive, what precautionary measures will you take? Answer: as corona pandemic is spreading

all over the world, safety steps should be followed to protect from corona disease and also to prevent further spreading. If your friend is corona positive, he should be kept separated from other and should follow protective measures. If you have meet your friend with corona disease positive, first of all unnecessary visiting to this patient is not recommended and ones should keep away from him for both benefit. But if visiting is necessary, you should have wearied a mask gloves, sanitizer or Dettol on hands applied and proper social distance of 3 to feet's is necessary, so you can protect yourself from this disease and other people's too. One should take effective steps and safety to protect himself from his pandemic disease. Their person who has corona disease should follow the full safety steps like use of mask, gloves, sanitizers and get quarantined unless he is recoverd.