**Course Title: General Pathology (MLT 2nd Semester Sec A and B)**

**Final term assignment**

**TIME: 6HRS Marks:50**

**Name: ………Hijab khan………………………………………**

**Class ID:………16661 ………………………………..**

**Section:……A……………**

**Note:**

* **Write in your own words, do not copy paste.**
* **Use only MS word to attempt questions.**

Attempt all questions. Each question carry equal marks.

Q1.What are the circulating cells in acute inflammation? Also write the characteristics of Acute inflammation.

**Circulating cells in acute inflamation :**

•Neutrophils

•Monocytes

•Eosinophils

•Lymphocytes

•Basophils

•Platelets

**ACUTE INFLAMMATION :**

**Events in acute flammation :** Neurologicevents

Hemodynamic events

Cellular events

Events overlap and are related

• Circulating Leukocytes : -- marginated cells emigrate from vasculature ( diapedesis ) smaller first, large later .

* Basophilis – release anti-coagulants
* Neutrophilis- vicious phagocytes

•release many chemical mediators – chemotaxis

• primary job is to phagocytes bacteria

• magnifies inflammation above required level in musculoskeletal injury .

* Monocytes macrophages : •Arrive – 5h post injury

•Remove dead tissue debris(clean up the mess )

Q2. Write a note on infarction and its types and write a note on Mast cells.

Ans ) **Infarction**, death of tissue resulting from a failure of blood supply, commonly due to obstruction of a blood vessel by a blood clot or narrowing of the blood-vessel channel. The dead tissue is called an infarct. Myocardial infarction (heart attack)—death of a section of heart muscle—results from obstruction of a coronary artery; the condition often accompanies coronary thrombosis. Infarctions may also occur in the lungs (pulmonary infarction) and the brain (see stroke).

Infarctions are divided into two types according to the amount of blood present:

White infarctions (anemic infarcts) affect solid organs such as the spleen, heart and kidneys wherein the solidity of the tissue substantially limits the amount of nutrients (blood/oxygen/glucose/fuel) that can flow into the area of ischemic necrosis. Similar occlusion to blood flow and consequent necrosis can occur as a result of severe vasoconstriction as illustrated in severe Raynaud's phenomenon that can lead to irreversible gangrene.

Red infarctions (hemorrhagic infarcts) generally affect the lungs or other loose organs (testis, ovary, small intestines). The occlusion consists more of red blood cells and fibrin strands. Characteristics of red infarcts include:

occlusion of a vein

loose tissues that allow blood to collect in the infarcted zone

tissues with a dual circulatory system (lung, small intestines)

tissues previously congested from sluggish venous outflow

reperfusion (injury) (5) previously ischemic tissue that is associated with reperfusion-related diseases. (6). such as myocardial infarction, stroke (cerebral infarction), shock-resuscitation, replantation surgery, frostbite, burns, and organ transplantation.

**MAST CELLS :**

A mast cell (also known as a mastocyte or a labrocyte. (1) ) is a migrant cell of connective tissue that contains many granules rich in histamine and heparin. Specifically, it is a type of granulocyte derived from the myeloid stem cell that is a part of the immune and neuroimmune systems. Mast cells were discovered by Paul Ehrlich in 1877. (2).  Although best known for their role in allergy and anaphylaxis, mast cells play an important protective role as well, being intimately involved in wound healing, angiogenesis, immune tolerance, defense against pathogens, and the blood–brain

Q3. Which are the cells having proliferative capacity? Explain them, also write about the characteristics of Benign tumor?

**CELLS HAVING PROLIFERATIVE CAPACITY :** The earliest bone marrow precursor cell types, often called stem cells, have a very large capacity for self renewal. This makes them a useful model system in which to test the hypothesis that normal somatic cells have a limited proliferative capacity. Marrow precursor cells differentiate and multiply to replenish the supply of various blood cell types that constantly turn over. Especially with erythrocyte production, this function is well defined and can be tested rigorously to determine whether a significant amount of the stem cell proliferative capacity is exhausted

Mesenchymal stem cells (MSCs) participate in regenerative osteogenesis by generating bone-forming cells. To examine the proliferative capacity of MSC populations from bone marrow and their relationship to trauma severity (multiple trauma, monofracture, atrophic nonunion), we quantified colony properties of human MSCs in vitro. Serum levels of mediators associated with bone formation were also assessed. Fifty-five individuals were enrolled in this study (13 multiple trauma patients, 15 patients with monofracture, 20 patients with atrophic nonunions, 7 healthy volunteers). The colony forming unit-fibroblast (CFU-F) assay was used to quantify total colony number, mean cell density per colony, and mean colony area. MSC phenotype was established using flow cytometry and osteogenic differentiation. MSCs obtained from multiple-trauma patients yielded the highest reservoir .

. IN recent discussions1,2 of the proliferative capacity of leukæmic cells in acute leukæmia, these cells have been treated as a uniform population with regard to their generation cycle. The reported findings of these studies that only a small percentage of the leukæmic cells incorporated labelled thymidine after short-term exposure have been taken to suggest a long generation time for these cells and therefore a low proliferative capacity. In the interpretation of these results, however, it is important to know if the leukæmic cell population is indeed relatively uniform with regard to cell division. For this purpose a comparison was made between the rate of incorporation of labelled thymidine by leukæmic cells obtained from blood and bone marrow of patients with acute leukæmia.

**BENIGN TUMOR :** A benign tumor is a mass of cells (tumor) that lacks the ability to either invade neighboring tissue or metastasize (spread throughout the body). When removed, benign tumors usually do not grow back, whereas malignant tumors sometimes do. Unlike most benign tumors elsewhere in the body, benign brain tumors can be life-threatening. Benign tumors generally have a slower growth rate than malignant tumors and the tumor cells are usually more differentiated (cells have more normal features). They are typically surrounded by an outer surface (fibrous sheath of connective tissue) or stay contained within the epithelium Common examples of benign tumors include moles and uterine fibroids Although benign tumors will not metastasize or locally invade tissues, some types may still produce negative health effects. The growth of benign tumors produces a "mass effect" that can compress tissues and may cause nerve damage, reduction of blood flow to an area of the body (ischemia), tissue death (necrosis) and organ damage. The health effects of the tumor may be more prominent if the tumor is within an enclosed space such as the cranium, respiratory tract, sinus or inside bones. Tumors of endocrine tissues may overproduce certain hormones. Examples include thyroid adenomas and adrenocortical adenomas.

Although most benign tumors are not life-threatening, many types of benign tumors have the potential to become cancerous (malignant) through a process known as tumor progression For this reason and other possible negative health effects, some benign tumors are removed by surgery.

Q4. What is hypovolemic shock? Explain along with its conditions.

**HYPOVOLEMIC SHOCK :** Hypovolemic shock is a life-threatening condition that results when you lose more than 20 percent (one-fifth) of your body's blood or fluid supply. This severe fluid loss makes it impossible for the heart to pump a sufficient amount of blood to your body. Hypovolemic shock can lead to organ failure.

Hypovolemic shock is an emergency condition in which severe blood or other fluid loss makes the heart unable to pump enough blood to the body. This type of shock can cause many organs to stop working .

Hypovolemic shock is a dangerous condition that happens when you suddenly lose a lot of blood or fluids from your body. This drops your blood volume, the amount of blood circulatin

g in your body. That’s why it’s also known as low-volume shock.

Hypovolemic shock is a life-threatening emergency. Blood helps hold your body temperature steady, forms blood clots, and moves oxygen and nutrients to all of your cells. If your blood volume gets too low, your organs won't be able to keep working.

The most common cause of hypovolemic shock is blood loss when a major blood vessel bursts or when you’re seriously injured. This is called hemorrhagic shock.

Hypovolemic shock is a life-threatening condition that results when you lose more than 20 percent (one-fifth) of your body’s blood or fluid supply. This severe fluid loss makes it impossible for the heart to pump a sufficient amount of blood to your body. Hypovolemic shock can lead to organ failure. This condition requires immediate emergency medical attention.

Hypovolemic shock is the most common type of shock, with very young children and older adults being the most susceptible.

Hypovolemic shock results from significant and sudden blood or fluid losses within your body. Blood loss of this magnitude can occur because of:

bleeding from serious cuts or wounds

bleeding from blunt traumatic injuries due to accidents

internal bleeding from abdominal organs or ruptured ectopic pregnancy

bleeding from the digestive tract

significant vaginal bleeding

Endometriosis

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 Q5.What is Edema? Explain its types also write about the classification of Thrombosis.

**EDEMA :** Edema is swelling caused by excess fluid trapped in your body's tissues. Although edema can affect any part of your body, you may notice it more in your hands, arms, feet, ankles and legs.

Edema is swelling or puffiness of parts of the body. Edema usually happens in the feet, ankles, and legs. It also can affect the face and hands. Pregnant women and older adults often get edema, but it can happen to anyone.

**TYPES OF EDEMA :**

**Periphral edema :**  This usually affects the legs, feet, and ankles, but it can also happen in the arms. It could be a sign of problems with your circulatory system, lymph nodes, or kidneys.

**Pedal edema:**. This happens when fluid gathers in your feet and lower legs. It’s more common if you’re older or pregnant. It can make it harder to move around in part because you may not have as much feeling in your feet.

**Lymphedema :**. This swelling in the arms and legs is most often caused by damage to your lymph nodes, tissues that help filter germs and waste from your body. The damage may be the result of cancer treatments like surgery and radiation. The cancer itself can also block lymph nodes and lead to fluid buildup .

. **Pulmonary Edema :** When fluid collects in the air sacs in your lungs, you have pulmonary edema. That makes it hard for you to breathe, and it’s worse when you lie down. You may have a fast heartbeat, feel suffocated, and cough up a foamy spittle, sometimes with blood. If it happens suddenly, call 911.

. **Cerebral edema :** This is a very serious condition in which fluid builds up in the brain. It can happen if you hit your head hard, if a blood vessel gets blocked or bursts, or you have a tumor or allergic reaction.

. **Mascular Edema :**This happens when fluid builds up in a part of your eye called the macula, which is in the center of the retina, the light-sensitive tissue at the back of the eye. It happens when damaged blood vessels in the retina leak fluid into the area.

**THRAMBOSIS :** Thrombosis is a process involving the formation of a clot in the bloodstream and is classified into several different types, according to the location of the thrombus. The two broad classifications are venous thrombosis and arterial thrombosis, depending on whether the clot was developed in an artery or a vein.

**Classification :**

**Venous Thrombosis**

A venous thrombosis is categorised as a thrombus (blood clot) which has formed in a vein.

Veins are the blood vessels which (usually) carry blood away from the heart. Blood can flow more slowly in the veins than the arteries, and this can increase the likelihood of blood clots forming in these vessels. However, other factors also increase the chances of a person suffering from a venous thrombosis.

**Superficial Vein Thrombosis**

A superficial vein is a vein which is close to the surface of the body. They are normally responsible for helping to cool the body. It may be possible to see these veins bulging out under certain conditions. Patients may feel a slightly harder area or witness some reddening of the area. These thromboses are not normally as serious as deep vein thrombosis; however they can become more serious if they are able to enter deep veins through the perforator veins.

**Deep Vein Thrombosis (DVT)**

Deep vein thrombosis occurs within the deep veins, which run further away from the surface of the skin. More blood is carried through the deep vein systems than through the superficial veins. Most deep vein thrombosis occurs within the legs, although they can occur anywhere within the deep vein system.

**Renal Vein Thrombosis (RVT)**

A renal vein thrombosis is a thrombosis that occurs in the veins that drain blood away from the kidneys. These clots reduce the ability of the kidneys to clean and filter the blood. This can increase the risk that further clots will then develop. RVT should be treated as soon as it is discovered, to help to maintain stable renal function. Men are twice as likely to suffer from RVT as women are, although the reasons for this are largely unknown. It mainly affects people over the age of 40.

**Arterial Thrombosis (atherothrombosis)**

Arterial thrombosis is much less common than venous thrombosis, although it poses similar risks. The veins are responsible for taking blood and oxygen to different sections of the body. The blood is normally subject to higher pressure when it is travelling in the veins and may be moving more quickly. It is therefore less likely to clot in the arteries. Whereas venous thrombosis normally lead to swelling and fluid congestion in an area, arterial thrombosis can lead to body tissue becoming starved of blood and oxygen. This can eventually lead to necrosis of the tissue. A thrombosis or embolism in the coronary artery can cause a heart attack. If blood supply to the brain is disrupted, the patient may suffer a stroke.

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