

( In the name of Allah who knows the beating of our hearts)

Paper:General Pathology

Name:Itizaz Hassan

ID:16662

Department:BS MLT

Semester:2<sup>nd</sup>

Date 15/04/2020

Qno1:Define the following with two Examples:

Answer:

A. Atrophy:

It is the process when cell losses all it important substances or materials due to which the size of the cell, organs or tissue decreases or get shrinkage is known as atrophy.

- This is because of the poor nutrition,poor circulation, loss of hormonal support and loss of nerve supply to the targeted organ.
- Examples:
  - Charcot-Marie tooth disease.
  - Poliomyelitis.
  - Denervation.
  - Reduction of estrogen can cause atrophy in beast.

B:Hypertrophy:

- It is the condition when the size of cell, organs and tissue increases because of the excessive nourishment is known as Hypertrophy . Only the size of cell gets bigger and bigger.
- During this process no new cell is made instead the cells just continues to become bigger and bigger and also bigger cells containing increased amounts of structural protein and organelles.
- EXAMPLES:
  - Increase in the size of Uterus during pregnancy is due to the stimulus of estrogen which causes the Enlargement of smooth muscle.
  - Increase in the size of Cardiac muscle which results in aortic valve disease.

C:Hyperplasia:

- It is the condition when the numbers of cell increases due to which the size of organs or tissues increases, this is known as Hyperplasia.
- The number of cell is increase because of the rapid cell division or cell mitosis means the cell mitosis or cell division increases.
- Hyperplasia is also known as over formation of cell in the body.
- EXAMPLES:

- Hormonal Hyperplasia, in which the concentration, multiplication, spread, expansion, extension, of the glandular epithelium of the female breast at pregnancy and puberty.
- Compensatory Hyperplasia, in which the remaining tissue grows when it is removed or lost of the organ part like when the part of liver is cut or removed or lost.

D: Metaplasia:

- It is the process in which the original cell changes to another type because the original cell is not suitable enough for the environment. They change to another because of the new suited environment.
- This process is Metaplasia because of the change in form.
- The cell may come to normal pattern or form when the stimulus is removed which causes Metaplasia.
- EXAMPLE:
- Barrell's esophagus.
- Change in respiratory tract which causes to inhalation of dust, smoke, smog. In the Cilia does not work properly and increase in the secretion of mucus, which may result in cancer. This may happen if the stimulus smoking is not removed.

Qno2: How does the calcium ions influx affect the cell. Write In your own words.

Ans:

- The calcium ions influx affect the cell, because it repairs and activates the damaged cell membrane which is known as Phospholipases, damages cell membranes and cytoskeleton which is known as Proteases and also repairs damaged DNA and is called Endonucleases. The influx of calcium ions comes to cytosol for other cells with extracellular fluid which is transferred to Mitochondria and it is stored in the Mitochondria and also taken and stored in endoplasmic reticulum.
- Calcium ion influx is the most important for preventing cell death because there is a reason for the cell death when lysosomal enzyme from the lysosomes is leaked out then it damages the cell membrane and damages other organelle because Lysosome has very toxic enzymes. So that's why the calcium ion influx at its normal level prevents cell death. The hypoxia and ischaemia with certain toxins prevent calcium ion influx.

Qno3:

What is free radical? What is the effect of Reactive oxygen species on the cell?

Ans:

- Free radicals are molecules which do not have pair or odd number of electrons, and molecules with odd number of electrons are highly unstable means their electrons move freely. Free radicals occur in both organic i.e. quinones and inorganic molecules i.e.  $O_2^-$ . These are very reactive and their reactions are critical for normal activities of a wide spectrum and biological processes.

- Effect of Reactive Oxygen Species on the Cell:
- ROS is chemically reactive chemical containing oxygen e.g (peroxides, superoxides, singlet oxygen etc). Addition of oxygen to ROS with the potential causes cellular damage.
- It can damage DNA, RNA, LIPIDS, PROTEIN and other important components of cell. These components contribute to the physiology of aging.
- As we know that ROS help in cell signaling and homeostasis.
- However during UV and during heat exposure the risk of ROS increases. Increase in ROS damages the cell structure which is known as oxidative stress. And also when it gets in to the cell through membrane it rapidly attacks and degrades and damages nucleic acid, membraneal molecules and organelle.
- ROS denature the cell and stop and disturb its metabolic activities due to which the cell does not perform its normal activities. And also it destroys the cell and organelles membranes and due to which cell shape and structure is changed.

Qno4:

Write down some differences between Apoptosis and Necrosis?

Ans:

- Apoptosis:
- It is a process of cell death in which the cell activates its own enzymes and which reduce or weaken the cell its own nuclear DNA and nuclear and cytoplasmic protein.
- Necrosis :
- It is the pathway for cell death in which the membrane of the cell is destroyed and all the important content is leaked which result in the cell dissolve its components because of the denaturing action of enzymes on the damage or destroyed cell.
- Differences between Apoptosis and Necrosis:
- A: Apoptosis could be Physiological and Pathological.
- Necrosis is always Pathological process.
- B: Apoptosis causes naturally.
- Necrosis causes by factors inside the cell or tissues such as infection, toxins or trauma.
- C: Apoptosis has no noticeable symptoms.
- Necrosis causes inflammation which result in decrease in flow of blood at affected site and tissue death.
- D: Apoptosis very rarely needs treatment.
- Necrosis always required medical treatment. Un-treated Necrosis is dangerous and can lead to death.

Qno5:

Write a note on Air Embolism?

Ans :

- It is the blockage of some part of the cardiovascular system by any mass enter to the site through blood stream is called Embolism.
- And the intra vascular liquid, solid, or gaseous mass that is passes by the blood to the site distant from its point of origin is known as Embolus.
- 99% emboli comes from dislodgment of thrombi and therefore called thromboembolism.
- Air Embolism:
  - Air embolism is also known as gas embolism. It is the blockage of blood vessel which is caused by one or more bubbles of air or other gas in the circulatory system.
  - The air bubble block in the vein is known as Venous air embolism.
  - The air bubble enter in the artery is known as arterial air embolism.
  - The traveling of these air bubbles to the brain, heart, and lungs can cause heart attack, stroke, or respiratory failure.

THE END.

THANK YOU.