

UNIVERSITY SOLVED QUESTION WITH ANSWER

Year : 2018-19

Subject : Pathophysiology

Subject Code : 23PBP204

Subject In-Charge : Mr. Pankaj Kumar Rout and Ms. Monali Padhi



Registration No :

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Total Number of Pages : 01

B.Pharm
BP204T

2nd Semester Regular / Back Examination 2018-19

PATHOPHYSIOLOGY

BRANCH : B.Pharma

Time : 3 Hours

Max Marks : 75

Q.CODE : F475

Answer Question No.1 (Part-A) and 02 (Part-B) which are compulsory and any TWO from Part-C.
The figures in the right hand margin indicate marks.

Part- A

- Q1 **Objective Answer Type Questions (Answer All)** (2 x 10)
- a) Define apoptosis with suitable example.
 - b) Differentiate between necrosis and autolysis.
 - c) What is triple response during acute inflammation?
 - d) Differentiate between stable angina and unstable angina.
 - e) Write the characteristic features of gout.
 - f) State various symptoms of Depression.
 - g) Define Asthma and write its symptoms.
 - h) Which serum markers are evaluated for diagnosis of jaundice?
 - i) Write the causes of Megaloblastic anemia.
 - j) Define STD and write the causative agent of gonorrhoea?

Part- B

- Q2 **Focused-Short Answer Type Questions- (Answer Any Seven)** (5 x 7)
- a) Explain the pathogenesis of fatty liver.
 - b) Differentiate between hypertrophy and hyperplasia with suitable examples.
 - c) Define Congestive Heart Failure. Discuss pathogenesis, sign and symptoms of the disease.
 - d) Describe about various mediators of inflammation.
 - e) Discuss the pathophysiology and symptoms of peptic ulcer.
 - f) Explain the pathogenesis and symptoms of Acute renal failure.
 - g) Define Myocardial infarction. Describe the pathogenesis and diagnosis of the disease.
 - h) What is Rheumatoid Arthritis? Explain the pathogenesis of the disease.
 - i) Define AIDS. Discuss the pathogenesis, sign and symptoms of the disease.

Part-C

Long Answer Type Questions (Answer Any Two)

- Q3 Discuss about various causes of cell injury and describe pathogenesis of reversible cell injury due to hypoxia. (10)
- Q4 Define Hypertension. Classify it. Discuss the pathogenesis and symptoms of hypertension. (10)
- Q5 Classify Diabetes mellitus. Describe the pathophysiology, diagnosis, symptoms and complications of diabetes mellitus. (10)
- Q6 Define Tuberculosis. Classify it. Describe the mode of transmission, pathogenesis, symptoms and diagnosis of tuberculosis. (10)

2 marks Question Answer :-

i) a) Define apoptosis with suitable example?

A) Apoptosis is a process of programmed cell death that removed ~~and death~~ damaged or unneeded cells from the body.

- It is a normal process that helps to maintain health and prevent disease.

- The process of apoptosis may be blocked in cancer cell.

Example: Those between the fingers of a developing hand in adults. apoptosis is used to rid the body of cells that have been damaged beyond repair.

b) Differentiate between necrosis and autolysis?

A) Necrosis

- A line of demarcation is usually present

Autolysis

- no sharp line of demarcation between affected and healthy tissue.

- Circulatory changes are present.

- Circulatory changes are ^{not} present

- inflammation changes are ~~not~~ present

- inflammation changes are not present.

- Saprophytic growth not seen.

- Saprophytic growth is present

Q) what is triple response during acute inflammation?

A) The triple response is a set of visible changes that occur in skin when it is injured.

- The three parts of triple response are:

- Red spot: An immediate red spot that appears due to capillary vasodilation
- flare: A red area appears around the red spot due to arteriolar dilation
- wheal: A local swelling that appears due to increased vascular permeability.

d) Differentiate between stable angina and unstable angina?

A) stable angina

- It is predictable
- The pain occurs with physical activity.
- The pain typically last for a short period
- not considered generally less risky.

unstable angina

- It is unpredictable
- The pain occurs with suddenness.
- The pain is typically last for a long period
- unstable angina is more serious

(E) write the characteristics features of gout?

- A) - Gout is a form of inflammatory arthritis that occurs when uric acid builds up in the blood - forming a sharp crystal in joints and tissues
- The characteristics are :-
1. Acute pain - It is causes and sudden severe pain.
 2. Common affected joints - The big toe is the most common site
 3. Redness and swelling - The affected joints become red, swollen warm to touch

(F) various symptoms of Depression?

A) Depression can manifest in a variety of symptoms, affecting both the mind and body.

Emotional symptoms :-

- persistent sadness or hopelessness
- loss of interest
- irritability or frustration

Physical symptoms :-

- fatigue or low energy
- sleep problems
- slow movements or feelings

~~Asthma is a chronic respiratory condition~~

- Q) Define Asthma and its symptoms?
- A) Asthma is a chronic respiratory condition which the airway in the lungs become inflamed, narrow and swell making it difficult to breathe.

Common symptoms of asthma

- 1) wheezing
- 2) Shortness of breathing
- 3) Chest tightness
- 4) coughing
- 5) increased mucus production

Q) Which serum markers are evaluated for diagnosis of jaundice?

A) Bilirubin serum markers are evaluated for diagnosis of jaundice.

Ex: Aspartate Aminotransferase
Alkaline phosphatase

Q) Write the causes of megaloblastic anaemia

A) It is characterized by the presence of abnormally large red blood cells in the bone marrow & in peripheral blood.

- It is often caused by deficiencies in vitamin B12 or folic acid. Both are essential for proper red blood production.

Q) Define STD and write causative agent of gonorrhoea?

A) STD is sexually transmitted disease refers to infection that are primarily spread through sexual contact. including vaginal, anal or oral sex.

- gonorrhoea is a common sexually transmitted infection caused by the bacterium *Neisseria gonorrhoea*.

Q2) Explain the pathogenesis of fatty liver?

A) Fatty liver also known as hepatic steatosis occurs when excess fat accumulates in liver cells. The condition can be categorized in 2 types.

1. Non-Alcoholic fatty liver disease
2. Alcoholic fatty liver disease

Sign and symptoms:

- alcohol consumption
- fatigue
- pain in abdomen
- loss of energy
- anorexia.

Pathogenesis

Excessive consumption of alcohol

↓
Liver cells metabolise alcohol to acetyldehyde in the presence of alcohol dehydrogenase enzyme

↓
Acetyldehyde is further metabolised to acetate in the mitochondria in presence of acetaldehyde dehydrogenase enzyme

↓
Nicotinamide adenine dinucleotide is reduced to NADH in the presence of both enzymes.

↓
Increase amount of NADH in relation to NAD it increases lipogenesis to decrease fatty acid oxidation it is caused fatty liver.

Treatment - less consumption of alcohol

- healthy diet

- Vaccinations of influenza A, B and pneumonia.

b) Differentiate between hypertrophy or hyperplasia with suitable example.

Hypertrophy

- Hypertrophy refers to an increase in size of cells in an organ or tissue.
- involves cell enlargement where existing cells increase in size by synthesizing more protein and organelles.
- occurs due to increased protein synthesis within cells resulting in an increasing in their size.
- Leads to increase in the size or volume of the affected tissue or organ without a significant change in its overall mass.
- Ex: when you lift weights and build muscle, the muscle fibre then fibres get larger which is considered hypertrophy.

Hyperplasia

- Hyperplasia refers to an increase in the number of cells in organ or tissue.
- involves cell proliferation where cells divide and replicate to increase their number.
- occurs due to increased cell division and replication driven by the activation of cellular signalling pathway that promote cell growth and proliferation.
- Resulting in an increase in overall size or mass.
- During pregnancy, the breast tissue increase in size due to the multiplication of milk producing cells which is hyperplasia.

c) Define congestive heart failure? Define pathogenesis, sign and symptoms of the disease?

A) Congestive heart failure is defined as failure of heart capacity to pump sufficient amount of blood that require proper functioning of the body.

- The term used CHF is known as congestive heart failure.

- It can be further classified into 3 types:

- ① Left side heart failure
- ② Right side heart failure
- ③ Both side heart failure

Sign and symptoms :-

- Chest pain
- Fatigue
- Irregular heart beat
- Headache
- Blurred vision
- Cough
- Shortness of breath
- Sweating

Pathogenesis

improper pump functioning

↓
Decrease in Arterial pressure

↓
Disturbance in kidney functioning

↓
Activation of RAAS system

↓
increased water reabsorption

↓
increased blood volume

↓
increased preload

↓
increased cardiac workload

↓
Heart Failure

↓
increase in venous pressure

↓
Activation of baroreceptor

↓
Vasoconstriction

↓
increased after load

↓
Heart Failure

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d) Describe about various mediators of inflammation?

A) Factors or chemicals that mediate the process of inflammation by vascular and cellular events are known as mediators of inflammation.

- These mediators can be either cell derived or plasma derived.

mediators of inflammation

cell derived mediators:

① Vasoactive amines: They give earliest inflammatory response.

- They are mainly 3 types

1. Histamine
2. Serotonine

3. Neuropeptides.

② Arachidonic Acid metabolites:

- It is a fatty acid.

- It is a constituent of phospholipid cell membrane.

- It is released from cell membrane by phospholipases.

- 3) lysosomal components \div They are responsible for Chemotaxis, degradation of bacteria.
- 4) platelet Activating Factor \div It released from basophils, mast cell, endothelium. and it increase vascular permeability
- 5) cytokines \div It's major function are adhesion and vasodilation.
- 6) oxygen metabolites and nitric oxide \div nitric acid is responsible for vasodilation

plasma derive mediators \div

The Kinin system \div This system is activated by XIIa factor that generate bradykinin.

- Bradykinin shows following action
- smooth muscle contraction,
- vasodilation

The clotting system

- It activated by XIIa that generates fibrinogen.
- They shows following action.
- Increased vascular permeability.
- Chemotaxis

The fibrinolytic system:

- Activates Factor XIII.
- Increased vascular permeability.

Complement system :-

it shows following action

- Release histamine
- Increase vascular permeability
- Increase phagocytosis

(e) pathophysiology and symptoms of peptic ulcer.

(A) A peptic ulcer can be defined as a sore

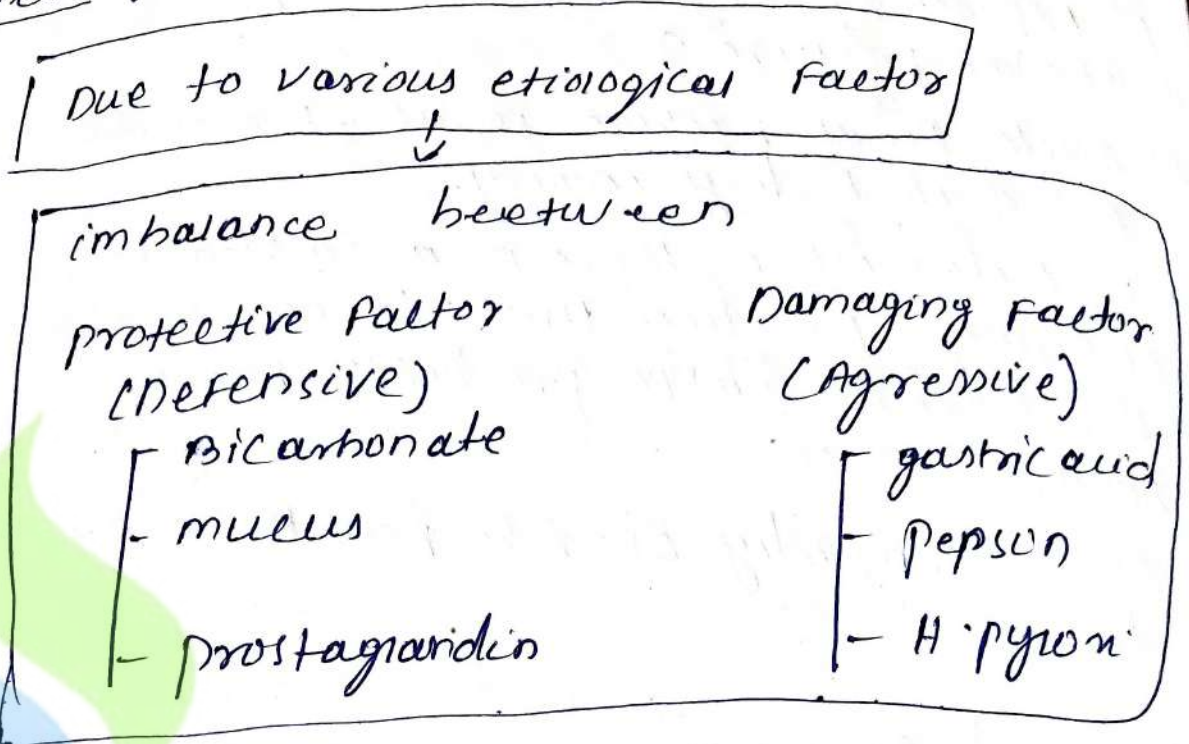
(1) or hole that forms in the lining of the stomach or the first part of small intestine.

- Peptic ulcer often results from imbalance of protective factor and damaging factor.

Sign and symptoms :-

- (e)
- Abdominal pain
 - Heartburn
 - Nausea
 - Vomiting
 - Bloating
 - Dark blood on stools
 - Indigestion

Pathogenesis :



↓

Decrease mucus production,
increase HCl secretion

↓

Destruction mucus lining

↓

peptic ulcer.

Treatment

- Antibiotics
- Antacids
- No smoking and alcohol

Q3 Explain pathogenesis and symptoms of Acute Renal Failure?

A) Acute Renal failure is also known as ~~not~~ acute kidney injury.

- It occurs when there is a sudden loss of kidney function that became unable to filtrate waste products from blood.

- It is rapidly over a few hours or days.

Sign and symptoms

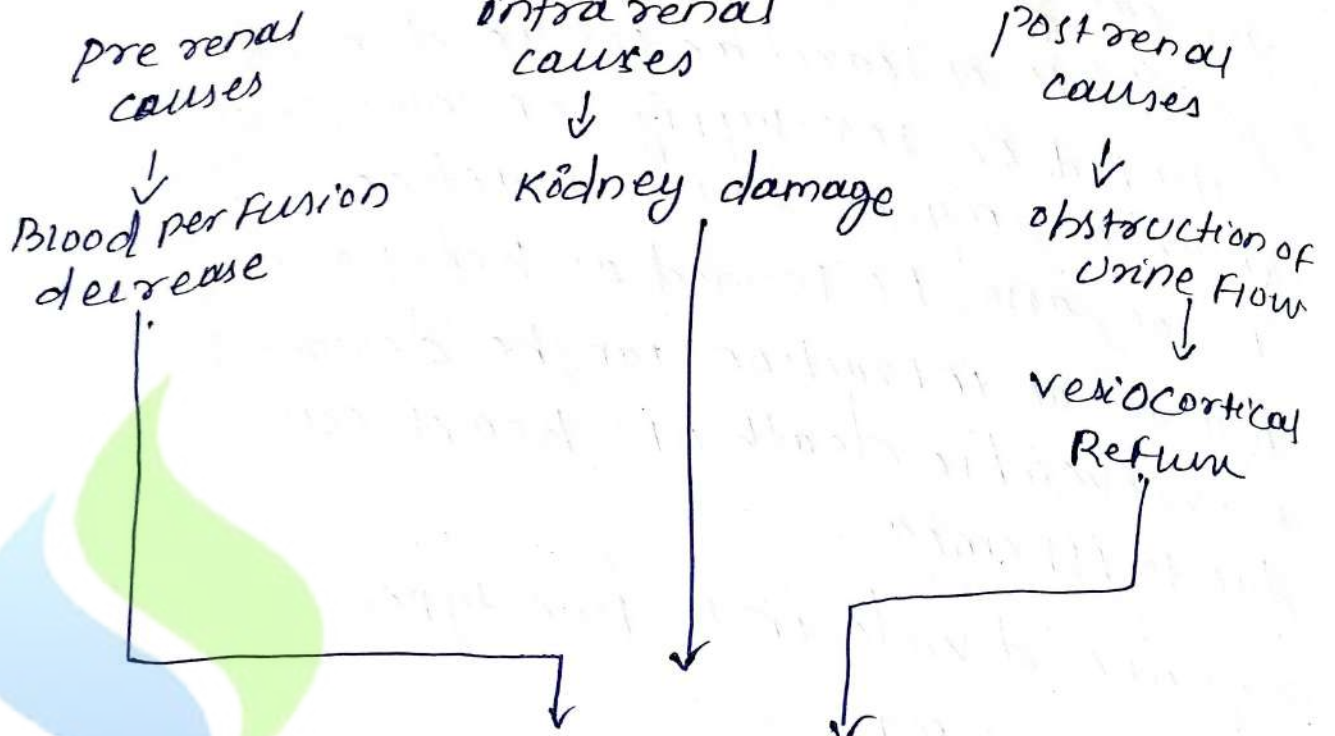
- Decrease urine output
- Fatigue
- Nausea
- Chest pain
- Dehydration
- Fluid retention

- loss of appetite.

It is categorized into 3 types

- ① pre-renal failure
- ② Intra-renal failure
- ③ post-renal failure

Pathogenesis of Acute Renal Failure :



impaired kidney function

↓
GFR decrease

↓
fluid Retention

↓
Acute Renal Failure.

Q Define myocardial infarction? Describe the pathogenesis and diagnosis?

A) The death of cardiac tissue due to disturbed or less supply of blood is known as myocardial infarction.

- It can also be termed as heart attack.
- myocardial infarction can be described as irreversible death of heart cells due to ischaemia.

They are divided into two types

- Transmural MI
- Non-transmural MI

Signs and symptoms

- Chest pain
- Fatigue
- Anxiety
- headache
- Shortness of breath
- Blurred vision.

Pathogenesis :-

various etiological factor



injury to endothelial cells that lines the blood vessels

inflammation



accumulation of lipids, platelets and other clotting factor.

formation of plaque



obstruction of blood flow



Decrease in oxygen supply



ischemic heart disease



myocardial infarction

Diagnosis

Blood test

ECG

Treatment :-

Pharmacological :-

Anti coagulants

Beta blockers

(b) what is Rheumatoid Arthritis? Explain the pathogenesis.

A) It is a chronic systemic inflammatory disorder that primarily affects the synovial membrane followed by extra-articular tissue.

- It may result in deformed and painful joints which can lead to loss of function.

- The synovium or membrane lines the synovial joint that lines the joint capsule and create the synovial fluid. It occurs in the group of 30-50.

Symptoms:-

- joint pain in feet hand and knee

- joint stiffness

- joint swelling

- fever

- loss of appetite

- fatigue

- muscle aches.

pathogenesis ↓

Various etiological factors inflammation

↓
Activation of T cells and B cells

↓
production of auto antibodies
and cytokines

↓
inflammatory pathway
initiated

↓
Proliferation of synovial joint

↓
pannus formation

↓
cartilage destruction and bony
erosion

↓
it is caused inflammation in
joint

↓
Rheumatoid arthritis

(c) Define AIDS and its pathogenesis and
(a) Aids is one types of STD. firstly
recognized in 1981.

→ Aids is a chronic and life threatening
condition caused by Human immuno
virus (HIV)

- It is the most advanced stage of
HIV infection.

- which damage the immune system
and makes the body risk and infection
and concerns.

Sign and symptoms

- Fever
- Fatigue
- weight loss
- muscle aches.
- night sweat
- Diarrhea.

pathogenesis :-

various etiological factor
↓
HIV infection - enter the
body
↓
viral replication in immune cells

Destruction of CD4
↓
Dysfunction of immune system
↓
Aids development
↓
Death (if left untreated)

Diagnosis

- HIV antibody test
- viral load test
- CD4 cell count

Treatment

- Anti retroviral therapy
- cancer therapy
- supportive care

long answer

(
(Q3) Discuss about various causes of cell injury and describe pathogenesis or reverse cell injury due to hyponia?

A) cells are the basic unit of tissue which form organ and system in human body.

- cell injury is defined as effect or variety of stress that cause changes in cells internal as well as external environment.

Causes of the cell injury :-

There are variety causes which can cause cell injury.

- genetic causes
- Acquired causes.

genetic causes :-

When cell injury occurs due to defect in genes or chromosomes then these type of causes are known genetic causes.

They are following types

- ① Developmental defect
- ② cytogenic defect
- ③ single gene defect
- ④ multifunctional inheritance disorder

Developmental defect: These are the defects that occur in the starting of development of fetal life.

Cytogenic defect: These are the defect that occurs related with abnormalities it can be either structural or numerical.

single gene defect: It is also known as mendelian disorder and occurs due to disorder in single specific gene.

multifunctional inheritance disorder: These are the disorder that occurs due to multifunctional gene effect.

Acquired causes :

- other genetic there are many other acquired causes that are responsible for cell injury.

- Hypoxia : cells of different tissue require oxygen and blood to generate energy. hypoxia is defined as low of oxygen supply while ischemia is defined as low of blood supply, both are the major cause of cell injury.

physical agents : there are many physical agents that can cause cell injury

- mechanical trauma - Accident
- Thermal trauma - heat / cold

Chemical agents: Following chemical defects can cause cell injury.

Chemical poisoning - cyanide, As etc.

Strong Acid/ base - H_2SO_4 , $NaOH$

Environmental pollutants.

Microbial agent: Various microbial agents like bacteria, fungi, viruses, protozoa that responsible for cell injury.

Immunological Agents: The immune system works in the defence against foreign agents but sometime immune response reaction such as hypersensitivity can cause cell injury.

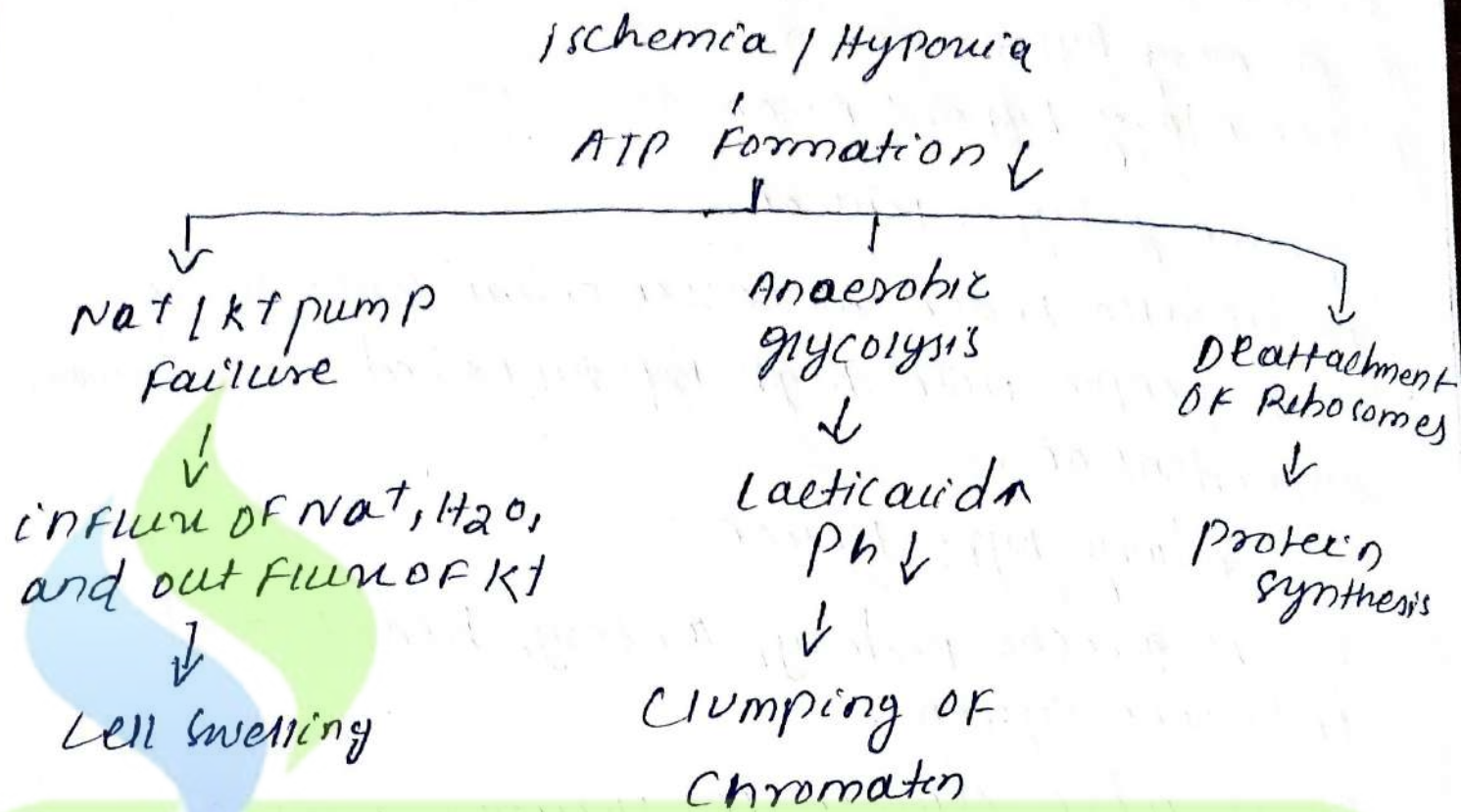
Nutritional Agents: Deficiency or excess nutrients may lead to nutritional imbalance which can cause cell injury.

Deficiency - Anaemia

Excess - obesity.

Psychogenic Defects - defects like Anxiety, depression.

Pathogenesis of reversible cell injury



Q4) Define hypertension & discuss about pathogenesis and symptoms of hypertension.

- A) The term hypertension refers to high blood pressure.
- It is a chronic medical condition that arises when the blood pressure is abnormally high.
 - It occurs when blood vessels get narrowed cause blood to exert more pressure on heart walls.
 - As per the world health statistics, approx 1.5 billion adults suffering hypertension.

Types of hypertension:-

It divide into two types,

- ① Primary hypertension.
- ② Secondary hypertension

Primary hypertension

- It is also known as essential hypertension
- 95% people with high B.P suffered with primary hypertension.

Secondary hypertension:-

- It arises kidney, artery, heart and endocrine system.
- It is more common in younger people

etiology

- Stress

- obesity

- High sodium diet

- Alcohol

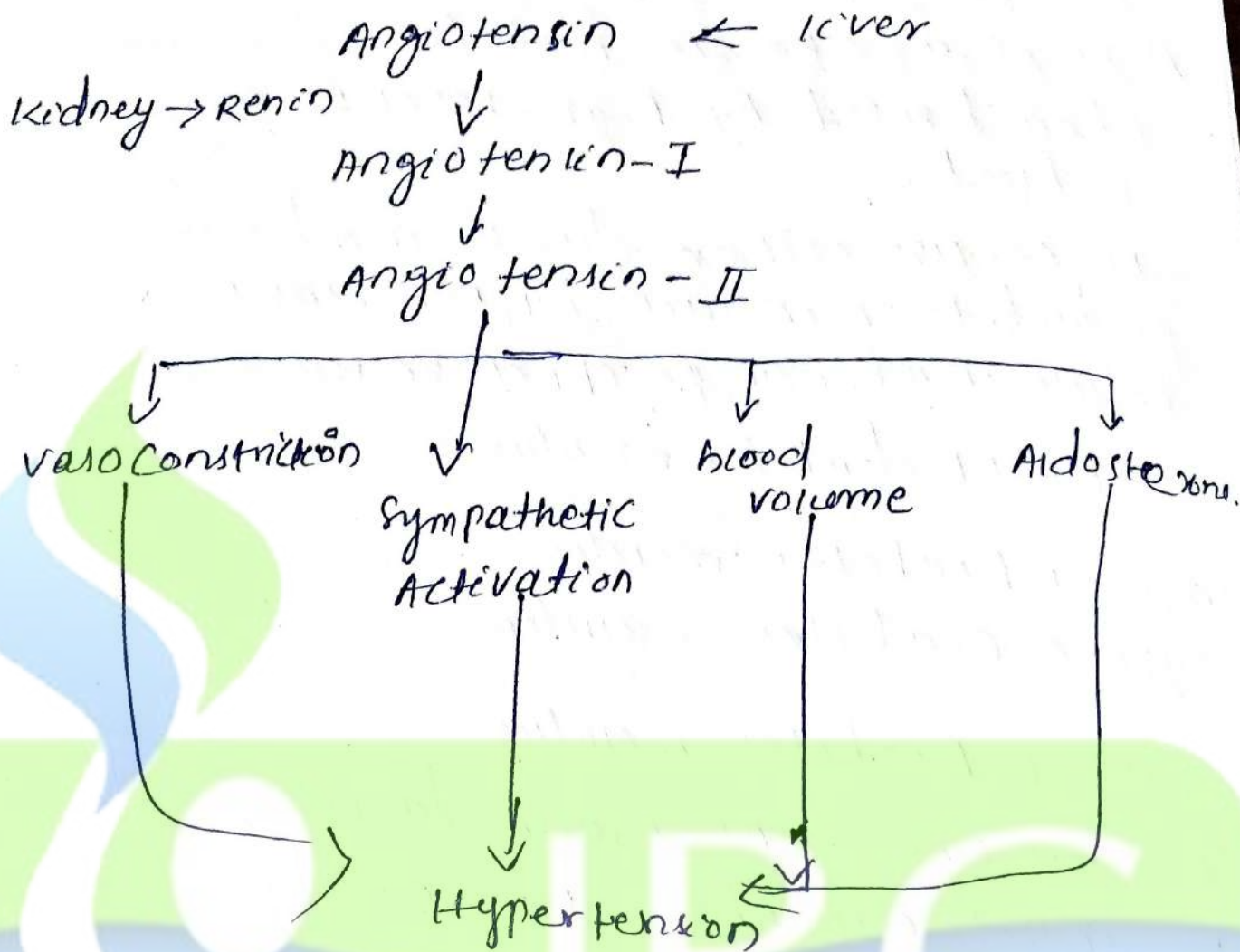
- Smoking

- Age

- Diabetes

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pathogenesis of hypertension



Sign and symptoms

- Headache
- dizziness
- Blurred vision
- Fatigue
- Chest pain
- Irregular heart beat

Q5) Classify Diabetes mellitus? and its pathogenesis and treatment

A) It is a chronic metabolic disorder characterized by high levels of glucose in blood.

- It occurs either due to inadequate production of insulin by pancreas or body's inability to effectively use insulin.

Types of diabetes mellitus

Type 1 Diabetes mellitus

Type 2 Diabetes mellitus

Type-1 Diabetes mellitus

- It was known as insulin dependent
- It constitutes about 10% cases of diabetes mellitus.

- It occurs due to destruction of β cells pancreas due to autoimmune disease

- Type 1 Diabetes often develops during childhood or adult age

causes

- genetic mutations
- viral infections
- Early childhood exposures
- seasonal patterns

Pathogenesis :-
Due to genetic mutation
↓
Autoimmune disorder
↓
Activation of cytotoxic T-cells
↓
Destruction of β -cells
↓
Deficiency of insulin
↓
Blood glucose level \uparrow
↓
Type 1 DM

Symptoms :-

- increased thirst
- frequent urination
- weight loss
- fatigue
- weakness

Complication

- Diabetic neuropathy
- Diabetic nephropathy
- Depression and anxiety.

Treatment

- insulin therapy
- physical activity
- Blood sugar level monitoring

Type-2 DM :

- It is also known as non insulin^o diabetes mellitus.
- It constitutes about 90% cases of diabetes.
- Type 2 DM if maintained for a long period that can also lead to insulin deficiency.
- It generally occurs after 30.

causes

- obesity
- physical inactivity
- un healthy diet
- Age
- gastrointestinal diabetes.

symptoms :

- Excessive thirst
- frequent urination
- increased hunger
- weight loss
- fatigue

pathogenesis :

Due to various etiological factor

↓
Receptor become insulin resistant

↓
insulin failed to bind with receptor

↓
Hypertrophy of β cell

↓
Hyperinsulinemia

↓
Failure of β cells

↓
Blood glucose level ↑

↓
pre diabetes

↓
DM type II

Complication

- Diabetic neuropathy
- Diabetic nephropathy
- Depression and Anxiety

Treatment :

- Healthy diet
- Regular exercise
- weight management
- Blood sugar monitoring

Q6) Define tuberculosis. Classify it
Describe pathogenesis and symptoms?

A) It is an infectious disease caused by bacteria *Mycobacterium tuberculosis*.

- The bacteria usually attack the lungs but they can also damage the other part brain, kidney etc.
- TB spreads through the air when a person with active TB infection, coughs, sneeze, close contact talk.

Types :

Latent TB infection : The bacteria remain in the body, but the person is not infectious.

Active TB disease : The bacteria multiply and cause symptoms making person infectious.

Etiology

- weak
- Age
- poor
- mal

Sign

Ch
we

F

M

C

C

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Etiology

- weakened immune system
- Age
- poor living condition
- malnutrition

Sign and symptoms

Chest pain

weight loss

fever

night sweat

chills

coughing up blood containing mucus.

pathogenesis

Inhalation of *M. tuberculosis* bacteria through droplet transmission from infected person.



Bacteria transmitted to alveoli



Activation of immune response



granuloma formation



Latent TB infection
(dormant)



Reactivation
(Active TB disease)

Complication

- Extra pulmonary spread
- Respiratory failure
- Blurred vision
- Liver and kidney affect

Treatment :-

- Prevention
- vaccination
- avoid contact

drugs

- Isoniazid
- Para amino salicylic acid

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Thank you