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BS MLT 4th semester

Chemical Pathology

Mid-Term Assignment

Course Title: Chemical Pathology

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Section A

1. Two students of MLT are talking about the use of cholesterol in food one says it's good to have cholesterols in food the other said use of more cholesterol is not good for our health, they both asked from his class teacher and he replied "having high triglyceride levels in your blood can make you more likely to have ____C_____
   A. Arthritis
   B. Feet infections
   C. Heart disease
   D. Beri Beri
2. Focal segmental glomerulosclerosis is a disease that scars the___B__
   A. Bowman's capsule
   B. Glomeruli
   C. Pancreases
   D. Liver
3. Minimal change disease **"MCD"** is the most common cause of nephrotic syndrome in__C___
   A. Women
   B. Men
   C. Children
   D. Aged
4. The main signs or symptoms make up nephrotic syndrome is/are_____D_____
   A. Proteinuria
   B. Hyperlipidemia
   C. Hypoalbuminemia
   D. All of the above
5. To diagnose a patient nephrotic syndrome, you should go for?
   A. Urine Test
   B. Blood Test
   C. Biopsy
   D. All of the above

6. Your class teacher gives you a history of patient such that a patient having yellow skin and body fluid that is the by-product of RBCs breakdown, Red blood cells typically survive for about 120 days before the body breaks them down, an increased breakdown of RBCs made the skin and body fluids colour yellow, this is due to_____A_____

    A. <u>Bilirubin</u>

    B. Cytokines

    C. Alpha blockers

    D. Side effects of NSAIDs

7. New-borns with jaundice are carefully monitored and generally improve within __B_____hours.

    A. 04 to 07

    B. <u>10 to 12</u>

    C. 12 to 24

    D. 48 to 72

8. All are true regarding Bilirubin Test Except?

    A. Is used to detect an increased level in the blood

    B. <u>Determine the cause of jaundice</u>

    C. Cannot diagnose blockage of the bile ducts.

    D. Help diagnose conditions

9. A patient of malabsorption syndrome is admitted in LRH ward and you have to test the condition, of all the possible diagnostics test the most reliable test of malabsorption is_____A_____

    A. <u>Stool test</u>

    B. Blood test

    C. Berth test

    D. Imaging

10. The Urine Albumin to Creatinine Ratio (UACR) is a test that estimates how much albumin is excreted in a ___B___period without requiring patients to collect urine for a whole day.

    A. 12-hour

    B. <u>24-hour</u>

    C. 48-hour

    D. 72-hour

11. Which option are not **true** about kidney functions?

A. Filter waste materials and toxin from the blood

B. <u>Production of vitamin E</u>

C. Red Blood Cells (Erythropoietin) formation

D. Synthesize hormones that regulate blood pressure

12. Structural and Functional unit of the kidney is?

A. Renal corpuscle

B. Renal tubule

C. <u>Nephron</u>

D. All of the above

13. Normally: The pH of urine

A. acidic

B. alkaline

C. <u>varies from acidic to alkaline</u>

D. varies from alkaline to acidic

14. Uric acid is the end product of ……C…. catabolism.

A. Thymine

B. Pyramidin

C. <u>Purine</u>

D. Urea

15. …**A**….is known as the good cholesterol.

A. <u>HDL</u>

B. LDL

C. VLLDL

D. Triglycerides

Section B

Q1. What do you know about proteinuria?

When healthy kidneys filter fluid, minerals and wastes from the blood, they typically don't allow large amounts of serum protein to flee into the urine. But when kidneys aren't filtering properly, proteinuria can occur, meaning that an abnormal amount of protein is present within the urine

The two major groups of serum proteins in the blood are albumin and globulins. Albumin is abundant within the blood, accounting for quite 50 percent of all serum proteins. Its important functions include pulling water into capillaries and maintaining the proper amount of water within the cardiovascular system,

As well as necessary and resonant substances that are poorly soluble in water. Three examples of these substances are fat soluble vitamins, calcium and some medications.

Globulins are divided into alpha, beta and gamma globulins. Alpha and beta globulins also transport substances, while gamma globulins are known as immunoglobulin or antibodies. Testing for protein within the urine can include all the various proteins or albumin only.

Types of proteinuria

Transient proteinuria is that the temporary excretion of protein and may be caused by strenuous exercise, a high fever, exposure to cold, stress and other conditions. Pregnant women can also excrete more protein in their urine. Transient proteinuria doesn't involve underlying renal disorder and requires no treatment.

Orthostatic proteinuria means an increased amount of protein is excreted when an individual is within the upright position. It's most often found in tall, thin adolescents and young adults less than 30 years of age. The kidneys are usually healthy.

Symptoms of proteinuria

In most cases, proteinuria has no symptoms and is detected during a routine screening in people with high vital sign or diabetes. If protein loss is severe, inflammation or edema can occur. Edema can be present in the:

Face and around the eyes

Arms, hands, legs, ankles and feet

Abdomen

Q2. explain Ketonuria and phenylketonuria in detail.

Ketonuria may be a medical condition characterized by ketones within the urine

Ketones are metabolic end-products of fatty acid metabolism. In healthy individuals, ketones are formed within the liver and are completely metabolized in order that only negligible amounts appear within the urine. However, when carbohydrates are unavailable or unable to be used as an energy source, fat becomes the predominant body fuel rather than carbohydrates and excessive amounts of ketones are formed as a metabolic byproduct. Higher levels of ketones within the urine indicate that the body is using fat because the major source of energy.

Causes of ketonuria

Our bodies use a mixture of carbohydrates, proteins, and fats to fuel cellular tissue. Glucose is the most important energy source as it can be easily utilized by cells. However, this is only if the hormone insulin is on board to help facilitate the deliverance of glucose into the cell. Metabolic conditions, like DM , are ready to efficiently use glucose and force the body to use other means for producing energy.

Associated conditions:

Starvation

When you don’t consume food for a long period of time, insulin decreases. Once our body has depleted reserve glucose stores within the body, it'll begin to cannibalize your fat and muscles, creating ketone bodies as an alternate fuel source known as ketosis.

Digestive disturbances

If the intake or absorption of carbohydrates become compromised, body will lean on converting fat and muscle into the energy it needs. This will lead to the development of ketone in the blood and in the urine.

Strenuous exercise

When you exercise too hard, it creates more demand from muscles to give them energy. If the body has an absence of glucose stores, body will use an alternative source of energy: fat. While it's most desirable to reduce , it'll cause ketone production, which is eventually excreted through the urine.

Excessive vomiting and diarrhea

Essentially causes the body to travel into starvation mode because it tries to interrupt down fat as its fuel source. This will lead to the production of ketones, which gets excreted into the urine.

Dietary imbalance

Eating a diet that is primarily high in fat or low in carbohydrates can effectively shift the majority of energy source stemming from fat, creating ketones in the process.

Symptoms of ketonuria

Symptoms that are present during a patient with ketonuria will depend upon the underlying cause. For the foremost part, patients will often are available with a previous diagnosis of type 1 diabetes that's poorly managed. The following may be seen upon presentation:

Fruity smelling breath: a standard sign searched for by medical professionals, especially when diabetes has been rushed to the ER . This is from a ketone called acetone, which has a fruity odor that is excreted through the lungs.

Nausea and vomiting: Ketone accumulation within the blood can cause an imbalance of other various electrolytes like sodium and potassium. Having low levels of these electrolytes can lead to nausea and vomiting if not corrected.

Heavy breathing: Increased ketone concentration within the blood can cause deep, heavy, and labored breathing.

Confusion and disorientation: Excess ketones can have a harmful effect on the brain over time.

Phenylketonuria

Autosomal recessive metabolic genetic disorder. Mutation in the gene for phenylalanine hydroxylase (PAH).

When PAH activity is reduced, phenylalanine accumulates and is converted into phenyl pyruvate (phenyl ketone), which can be detected in the urine.

Untreated PKU can cause intellectual disability, seizures, and other serious medical problems.

Patients who are diagnosed early and maintain a strict diet can have a traditional lifetime with normal mental development.

PKU is rare – it is estimated to affect 1 in every 10,000 babies.

Etiology

Autosomal recessive disorder caused by mutation in PAH gene. Located on 12th chromosome. A carrier doesn't have symptoms of the disease, but can expire the defective gene to his or her children.

Symptoms

Most babies with phenylketonuria appear healthy at birth. Symptoms usually only develop thanks to complications that arise if the condition isn't treated properly.

If it is not treated, damage to the brain and systema nervosum can lead to:

• Learning disabilities

• Behavioral difficulties

• Epilepsy

• Often have lighter skin, hair, and eyes than brothers or sisters without the disease.

• Other symptoms include:

• Eczema

• Recurrent vomiting

• Jerking movements in arms and legs

• Tremors

• Mood disorders

• Microcephaly,

Prognosis

The outcome is predicted to be excellent if the diet is closely followed, starting shortly after the child's birth. If treatment is delayed or the condition remains untreated, brain damage will

occur. If proteins containing phenylalanine are not avoided, PKU can lead to intellectual disability by the end of the first year of life.

Q3. Enlist all the possible cause of Cushing syndrome.

Cushing's syndrome is produced by prolonged contact of the bodies' tissue to high levels of the hormone cortisol. Cushing syndrome is also called hypercortisolism

Causes of Cushing's syndrome

- Majority of the individuals who agonize from Cushing's syndrome have had previous use of glucocorticoid hormones -Glucocorticoid hormones are used to stop transplant refusal as well as treat inflammatory diseases such as asthma, rheumatoid arthritis and lupus
- Other causes: Pituitary Adenomas: tumors of pituitary gland
- Adrenal gland overgrowth or adrenal tumors
- Too much pressure put on the body (ex. Athletes under intense training, pregnant women- carrying fetus)