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**Question No 1:** a. Difference between type 1 and type 2 diabetes?

b. as per your opinion which of the insulin delivery device is more effective?

**Answer**:

1. Difference between type 1 and type 2 diabetes

|  |  |
| --- | --- |
| Type 1 diabetes   1. Most often diagnosed in childhood. 2. Not linked to increased body weight. 3. Often associated with higher than normal ketone levels at diagnosis. 4. Insulin injections or insulin pumps are treated. 5. Episodes of low blood sugar level hypoglycemia are common. 6. It can be controlled without injecting insulin. | Type 2 diabetes   1. Usually diagnosed in over 30 year odd’s. 2. In most cases associated with increased body weight. 3. It is related to high blood pressure / or cholesterol level in the diagnosis. 4. It can be treated initially without medication 5. There is no episodes of low blood sugar level, unless the person is taking insulin or certain diabetes medication. 6. Sometimes possible to come off diabetes medication. |

1. Effective insulin delivery device

* **Continuous subcutaneous insulin infusion devices**
* It avoid the need of the need of multiple daily injections
* Provide flexibility in the scheduling of patient’s daily activities.
* Programmable pumps deliver a constant 24-h basal rate, and manual adjustments in the rate of delivery can be made to accommodate changes in insulin requirements (before meals or exercise).

**END**

**Question No 2:** **a.** Explain the role of vitamin K in blood clotting and treatment of bleeding disorders?

**Answer:**

1. Role of vitamin K in blood clotting and treatment of bleeding disorders:

* Factors II (prothrombin), VII, IX, and X make up the core of the coagulation cascade.
* These factors are synthesized in the liver in the inactive form.
* They undergo post translational modifications, gamma carboxylation of glutamic acid residues.
* Gamma carboxylation imparts another negative charge to promote the effective binding of these factors/ protein to calcium ions.
* γ –carboxyglutamates by chelating calcium ions, therefore, permit the binding of the blood clotting protein to membranes.
* Prothrombin and several other protein of the blood cotting system (factors VII, IX and protein C and S) each contain 4-6 γ carboxyglutamate residues.
* Vitamin K helps the body to firm blood clotting proteins.

1. Thrombolytic agent:

* Thrombolytic agents are agents which are used to dissolve dangerous clots in blood vessels, improve, blood, and prevents damage to tissues and organs.

**Example:**

Streptokinase:

* Recombinant streptokinase and plasminogen together form stoichiometric 1:1 activator complex.
* Activator complex converts remaining plasminogen, present either in the blood or in thrombus to plasmin.
* Plasmin lysis thrombi by converting insoluble fibrin into soluble fibrin degradation products.

**END**

**Question No 3:** a. Explain the effects and adverse effects of organic nitrates in angina pectoris?

b. write down treatment algorithm for improving symptoms of stable angina?

**Answer: a.**

Effects of nitrate:

1. Decrease myocardial O2 demand
2. Increased myocardial O2 supply
3. Decrease platelets aggregation

Adverse effects of nitrates:

1. Headache
2. Flushing
3. Hypotension
4. Tolerance
5. Reflex tachycardia
6. Reflex increased in cardiac contractility

**b.** Treatment of stable angina:

1. **General measure:**

* Do not smoke.
* Aim at ideal body weight.
* Take regular exercise –exercise up to but not beyond point of chest pain is beneficial.
* Avoid severe unaccustomed exertion, vigorous exercise after a heavy meal, or in very cold weather.
* Take sublingual nitrate before any physical exertion that may induce angina.

1. **Specific:**

* Medical management
* Surgical management

Medical management:

1. Explain and reassurance to the patient
2. Advise for adaptation of physical activity
3. Identification and treatment of risk factors and precipitating factors
4. Treatment of acute attack
5. Prevention of attack

Treatment of acute attack

Sublingual nitroglycerin (angised), repeated in about 1-2 minutes.

Prevention of further attack

1. Nitrates
2. Berta blockers
3. Calcium antagonist

Other associated drugs

1. Aspirin
2. Statins

Surgical management:

* Revascularization

1. Percutaneous transluminal coronary angioplasty
2. Coronary artery bypass grafting

**END**

**Question No 4:** **a.** Differentiate between primary and secondary hypertension?

**b.** Explain the effect of renin on hypertension?

**c.** what is the importance of pharmacological treatment of hypertension?

**Answer: a.**

Primary hypertension:

Also called, idiopathic/essential hypertension

* 90-95% of cases
* Cause is unknown, but multiple defects in BP regulation exist.
* Result from complex interaction between genes, lifestyle and environmental factors.

Secondary hypertension:

* 5-10% of cases
* Result from an identifiable cause: eg, kidney disease, renovascular disease, endocrine disease, mechanical compression, pregnancy, obesity, sleep apnea.

**b.**

Angiotensinogen

**Renin**

Angiotensin l

Angiotensin converting enzyme

Angiotensin ll

Stimulation of aldosterone secretion

Aldosterone constriction of vascular smooth muscle

Increased water and sodium retention

**Increased preload**

**Increased afterload**

**c.** Importance of pharmacological treatment of hypertension

Because hypertension may cause:

* stroke
* Hypertensive encephalopathy
* Blood vessels damage (arteriosclerosis)
* Heart attack or heart failure
* Ischemic heart disease
* Kidney failure

Drugs used in hypertension:

1. Thiazide diuretics
2. Beta blocker
3. ACE inhibitors
4. Calcium channel blocker
5. Alpha blocker

**END**

**Question No 5:** a. Difference between right heart failure and left heart failure?

b. Summarize the pharmacotherapy of heart failure?

**Answer: a.**

|  |  |
| --- | --- |
| **Left side heart failure**   1. SOB/DOE 2. Crackles/ rakes at bases 3. Tachypnea 4. Diaphoresis 5. Weight gain 6. Fatigue 7. Extra heart sounds 8. Mental status changes 9. Capillary refill >3 sec | **Right side heart failure**   1. Hepatomegaly 2. Splenomegaly 3. Ascites 4. Dependent pitting edema 5. JVD (kussmaul’s sign) 6. Weight gain 7. Anorexia 8. Extra heart sounds |

**b. Pharmacotherapy of heart failure**

1. Diuretics

* Thiazide frusemide
* Spironolactone

1. Vasodilators

* ACE inhibitors
* Angiotensin receptor antagonist
* Nitrates, hydralazine

1. Digitalis
2. Beta-blockers
3. Anti-ischemic therapy
4. Anticoagulants
5. Coronary revascularization
6. Implantable cardioverter-defibrillator (ICD)
7. Biventricular pacing
8. Left ventricular assist devices (LVAD)
9. Cardiac transplantation

**End**