Neuroscience 1 module

Research 1

Give a detailed account on the following:

1. Describe the classifications and the histological structure of nerve cell by light and electron microscope and mention how collection of cells or collection of axons can form different structure.
2. Describe the different types of glia cells and their functions.
3. Anatomy of muscles of mastication.
4. Anatomy of the parotid gland.
5. Anatomy of mandibular nerve.
6. Discuss
    a. Cardiovascular effects of different doses of dopamine
    b. Difference in action of dopamine and dobutamine
7. **Clinical cases**

    First case:

    23 years old Female patient, complain of severe abdominal pain around the umbilicus then become localized in right iliac fossa. The pain associated with vomiting and pallor. So discuss in details

A. Type of pain in this case? Site of receptors?
B. Pathway of pain sensation from receptors till reaching the sensory cortex
C. Give other 6 examples for referred pain?
D. Discus gate theory of pain control?
E. How can the brain recognize the locality, modality and intensity of the sensations?

Second case:

A 6 years old boy, complain of nocturnal enuresis. He received medical advice from the pediatrician in the form of simple instructions and oral drugs, after one month of continuous treatment the boy improved.

A. Discus in details sympathetic and parasympathetic supply to the pelvis?
B. Compare between pre and post synaptic inhibition?
C. How can the output signals from a neuronal pool be prolonged?
D. Compare between graded potential and action potential?

Research 2

Give a detailed account on the following:

1. Describe the detailed histological structure of nerve fibers and nerve endings with special reference to degeneration or regeneration of nerves.
2. Describe the different types of glia cells and their functions.
3. Anatomy of the scalp.
4. Anatomy of maxillary artery.
5. Anatomy of posterior triangle of the neck
6. Pharmacological report of atropine:
    a. Pharmacological actions
    b. Clinical uses
    c. Side effects
7. **Clinical cases:**

    First case:

    40 years old male patient with history of 5 years type 1 D.M. Presented to the neurological clinic with tingling, numbness of recent onset. By examination the neurologist find that the patient lost vibration sense in both lower limbs till the level of both knees.

    A. Mention other diseases associated with absent vibration sense?
    B. Name receptors for vibration sense? What are the properties of receptors?
    C. Discus in details pathway of vibration sense?
    D. Describe types of postsynaptic potential?
    E. Discuss the form of synaptic plasticity with examples of each.

    Second case

    On the first day in the Anatomy lab for new Medical student, some students were nervous, irritable and tachycardic, the demonstrator of the lab tried to relax them. But once the body was exposed one student felt down with a vasovagal attack.

A. From your study on autonomic nervous system explain these situations.
B. What is the relationship of the adrenal medulla to the autonomic nervous system?
C. What hormones are secreted by a pheochromocytoma?

Research 3

Give a detailed account on the following:

1. Describe the classifications and the histological structure of nerve cell by light and electron microscope and mention how collection of cells or collection of axons can form different structure.
2. Describe the different types of glia cells and their functions.
3. Anatomy of deep cervical fascia.
4. Anatomy of external carotid artery
5. Anatomy of the styloid apparatus.
6. Difference between the effects of Epinephrine ,Norepinephrine and Isoproterenol regarding the following parameters:
    a. Receptors selectivity
    b. Heart rate, Cardiac contractility, Systolic blood pressure
    c. Diastolic blood pressure and Pulse pressure
7. **Clinical cases:**

    First case:

    A 52 years old male patient, complain of repeated attacks of chest pain, the pain referred to left shoulder, left arm and increased with exertion and improved by rest. The attack of pain associated with sever sweating and hypotension.

    A. What is the possible cause of pain in this case?
    B. What is the cause of sweating? Discus the different reactions to pain?
    C. Discuss Pathway of pain control inside the body?
    D. What is the mechanism of referred pain?

    Second case:

    A 30 years old athlete was doing his daily training in the gym. After 15 min of training his doctor noticed that he has sweating, pallor, tachypnea and tachycardia.

A. What autonomic nervous system is responsible for these manifestations?
B. Discuss in details other manifestations of this system in the present case
C. Discuss factor affecting synaptic transmission.
D. What is the lateral inhibition and its neurological importance?

Research 4

Give a detailed account on the following:

1. Describe the detailed histological structure of nerve fibers and nerve endings with special reference to degeneration or regeneration of nerves.
2. Describe the different types of glia cells and their functions.
3. Anatomy of thr oral cavity and tongue.
4. Anatomy of the submandibular gland.
5. Motor and sensory nerve supply of the face
6. Impact of therapeutic use of the following:
    a. Epinephrine in treatment of anaphylactic shock
    b. Ipratropium rather than Atropine in bronchial asthma
    c. Dopamine in treatment of cardiogenic shock
7. **Clinical cases:**

    First case:

    30 years old male patient, complain of severe headache with projectile vomiting. On examination the patient has mild weakness on right half of the body. CT brain imaging showing mass lesion in right cerebral hemisphere.

    A. What is headache? What is the possible cause of headache in this case?
    B. What are other different causes of headache?
    C. What are the pain sensitive structures in the head?
    D. What is the pathway of pain sensation in the body?

    Second case:

    In treating a patient with a movement disorder, you administer a newly developed drug whose functions were mediated at axo-somatic synapses.

    A. Describe axo-somatic synapses and give other types of synapse.
    B. Mention types of synaptic transmission.
    C. If a drug designed to hyperpolarize neuron to treat movement disorder, describe the actions of this drug on post-synaptic neurons.
    D. Discuss effect of sympathetic on upper and lower limbs.

Research 5

Give a detailed account on the following:

1. Describe the classifications and the histological structure of nerve cell by light and electron microscope and mention how collection of cells or collection of axons can form different structure.
2. Describe the different types of glia cells and their functions.
3. Anatomy of posterior triangle of the neck.
4. Anatomy of deep cervical fascia.
5. Anatomy of external carotid artery
6. Pharmacology of beta blockers:
    a. Classification according to receptor selectivity
    b. Drug example of each category
    c. Different pharmacokinetic properties,
    d. Therapeutic uses
    e. Adverse effects and contraindications.
7. **Clinical cases:**

    First case:

    33 years old female patient, will exhibit cholecystectomy. On entering the surgical unit she develops rapid heart rate (tachycardia), respiratory rate (tachypnea) and increased blood pressure.

    A. Explain in details the cause of tachycardia and tachypnea in this situation?
    B. Discus the sympathetic supply to the abdomen and pelvis?
    C. Discus properties of synaptic transmission between pre and post synaptic neurons?
    D. Give an account on types of synaptic inhibition?

    Second case:

    A patient is experiencing sever pain, if it were possible to place an electrode into the gray matter around the cerebral aqueduct of the mid-brain and stimulate the ells in this region, it would induce an analgesic response.

    A. How can you explain such an effect?
    B. What is the neural substrates underlying this phenomenon?
    C. Describe pathway of pain sensation?