AJK Medical College, Muzaffarabad

Endocrinology Module (0303)

4th Year MBBS

Pre-Requisite:
NEU-II & SPS-I (Eye) Module
Duration: 2-Weeks
Starting on:

DEPARTMENT OF MEDICAL EDUCATION

Endocrine Module Team

Prof. Dr. Anwar Ul Haque	(Module Planner)
Brig® Prof. Dr. Ahmed Khan	(Module Coordinator)
Prof. Abdul Ghaffar Nagi	(Member)
Dr. Nosheena	(Member)
Col. Dr. Kamran Butt	(Member)
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RATIONALE

Living creatures are superbly organized at all levels; indeed a reflection of the immense wisdom, knowledge, care and control of the One and Only Creator. Many sophisticated mechanisms, apparatuses and tools are used to provide the most distinguished system of communication and coordination within the cells, among the cells and among the tissues and organ systems! Endocrine system is one of those important systems. Its wireless out of this world most elegant wife system playing the most soothing and moving melodies of the music of life! This module is built up on the knowledge and clinical skills acquired in previous years. In this module we will consider in more details how the defects in hormone production and/or action can lead to profound clinical conditions and syndromes! How these disorders could be investigated, diagnosed and managed will be in-sha-Allah the crux of the present module horizontal, oblique, vertical 360^{o} integration.

AIMS OF THE MODULE:

The module aims to provide:

- Clinical relevance of endocrine disorders, including iatrogenic states, Growth disorders, thyroid disease, diabetes and other syndromes of hormonal dysfunction
- Knowledge and understanding of each of the major endocrine axes, emphasizing the clinical significance of abnormal feedback loops and its consequences
- Knowledge and understanding of the scientific basis of treatment options available for specified endocrine disorders
- Knowledge , understanding of the reproductive, developmental and genetic processes that contributes to abnormality and provoke critical thinking to approach problem-based learning in integrated way
- Clinical skills for understanding the basis of infertility, developmental anomalies

ORGANIZATION OF THE MODULE:

The module consists of 6 themes and it will employ different modes of instruction, briefly described below. Major emphasis will be on discussion, analysis and deductions; all by the students and guided by the faculty.

Teaching Strategy;

The content of this module will be delivered by a combination of different teaching strategies. These include small group discussions (SGD), large group interactive sessions (LGIS), demonstrations in dissection hall, lab practical and clinical skill sessions at skill lab. Group projects will be assessed at the end of the block.

Content Delivery;

Entire curriculum will be delivered by clinical case scenarios each covering a theme. Read the cases and the objectives of the theme which you are supposed to encounter next day, understand and explain the case to yourself and read the relevant information. Following learning/teaching strategies will be employed to discuss the cases:

Small Group Discussion;

Main bulk of the course content will be delivered in small group sessions. Each theme has an associated case. The case will be the centre around which learning will take place. Depending on the case you might be required to deduce objectives and learning issues or only learning issues. Every group will have a facilitator assigned to it. The facilitator will be there to keep you on track, giving you maximum liberty to discuss and achieve the objectives as a group. Small groups in some cases may be followed by a wrap up session. Rest of the information will be there in the schedule.

Large group;

Large group instruction will be employed at times sparingly. Attend large group sessions with the following focus

a. Identify important points

b. Ask questions of points not well understood in the text

c. Measure your learning comprehension

Videos:

Video demonstrations on history taking and clinical examination, on diseases will be shown to give you an idea into the disease process, testing and practical aspect of communication with the patients.

Hands-on Activities/ Practical;

Practical activities, linked with the case, will take place.

Lab:

Attend your scheduled lab and take advantage of free time for study .Use your labs to correlate text structures to actual specimens in lab practice.

Self Directed Learning:

A few SDLs have been added in between to create an environment for you to search literature as well as to deduce and synthesize information from different sources to meet the learning objectives. It will also help in breaking the monotonous / strenuous schedule and make you life- long learner.

Assessment:

A full-fledged formative assessment will be taken at the end of module. This will give you an idea about the format of the examination that you will go through at the end of the Block. Of course, this will be followed by feedback on your performance in the exam.

Marks obtained in the module examination will contribute 30% (internal assessment) towards end of year Professional University Examination.

ToS

#	Themes	Weight age
1	Gigantic child	10%
2	Dull puffy lady	10%
3	Great Masquerader	5%
4	Leaned and thin girl	30%
5	Moon face lady	15%
6	Painful Tender lower Abdomen	30%
	Grand Total	**100%**

LEARNING OBJECTIVES

THEME-1

At *the end of the theme, students will be able to:*

1. Elaborate the general concepts and principles of endocrinology in terms of

1. Definitions of endocrine, paracrine and autocrine actions
2. Types of hormones
3. Relationship between vitamins and hormones
4. Hormones & oncogenes
5. Eicosanoids: Prostaglandins, thomboxanes, Leukotrienes and related compounds
6. Classes of Hormone Action
7. Neuroendocrinology
8. Neurotransmitters and hormones
9. Hypothalamic -Pituitary Relationships
10. Hypothalamic neurotransmitters
11. Hypothalamic - Anterior Pituitary relationship
12. Hypothalamic - Posterior Pituitary relationship
13. The pineal gland
14. Gene Expression & recombinant DNA in Endocrinology & Metabolism
15. Hormone synthesis and release
16. Hormone Transport
17. Metabolism and elimination of hormones
18. Regulation of the Endocrine System
19. Mechanism of Hormone action
20. Hormone-Receptor interactions
21. Hormone agonists, Antagonists and partial agonists
22. Non-receptor hormone binding
23. Relations between hormone-receptor binding and responses
24. Structures of hormone receptors
25. Second messengers & Hormone action
26. Second messengers
27. Responsiveness to hormones
28. Actions of hormones
29. One hormone many effects
30. One action by several hormones
31. Developmental effects
32. Cell growth & cancer
33. Central nervous system effects
34. Effects on metabolism
35. Effects on Cardiovascular & Renal Function
36. Effects on mineral and water metabolism
37. Effects on skeletal functions
38. Effects on reproductive function
39. Effects on Immunologic functions
40. Hypo and hyper function
41. Specific defects in hormone biosynthesis
42. Defects in sensitivity to hormones
43. Approach to the patient with endocrine disease
44. Laboratory & imaging studies
45. Measurement of hormone levels
46. Hormonal Status measurements
47. Provocative tests
48. Imaging studies
49. Cytology and tissue biopsy procedures

50. Clinical interpretation of Laboratory tests
51. Treatment of endocrine diseases
52. Uses of hormones in therapy of non endocrine disease

2. Explain regulation of pituitary hormones

1. Define & explain cerebral , hypothalamic and other influences on pituitary hormones
2. Define pituitary adenomas in term of cell type, gross morphology,clinical presentation and complications
3. Enlist clinical manifestations of pituitary disease
4. Discuss the genetic alteration in pituitary adenomas
5. Outline the important pathological causes and clinical features of hypopituitarism
6. Narrate the clinical relevance of posterior pituitary syndrome in relevance to high and low levels of ADH
7. Enlist sellar tumors and describe origin , pathogenesis and manifestations of craniopharangiomas
8. Enlist tumors of floor of third ventricle
9. Define role , laboratory investigations in pituitary diseases and proper mode of obtaining sample and interpretation of laboratory results

THEME-2

At the end of the theme, students will be able to;

1. the etiology of Hypo and hyperthyroidism
2. Enlist the disorders associated with primary and secondary hyperthyroidism
3. Differentiate b/w infantile hypothyroidism and Myxedema
4. Enlist types of thyroiditis,give pathogenesis and microscopic picture of each
5. Define goiter and give its etiology and pathogenesis
6. Explain how diffuse goiter is transformed into multinodular goiter
7. Draw microscopic picture of adenomatous goiter
8. Give complications of goiter
9. Enlist primary thyroid neoplasia
10. Give microscopic features of following thyroid neoplasia;
    I. papillary carcinoma
    II. Follicular carcinoma
    III. Anaplastic carcinoma
    IV. Hurthle cell carcinoma
    V. medullary carcinoma
    VI. lymphoma
11. Give nodes of spread and prognosis of thyroidneoplasia
12. Explain role of FNAC (fine needle aspiration cytology) in diagnosis of thyroid disease
13. Discuss sources and requirements of iodine
14. Explain role of iodine in thyroid metabolism
15. Carry out epidemiological assessment of iodine deficiency / indicators

THEME- 3

At the end of the module students will in-sha- Allah be able to:

1. Define various types of hyperparathyroidism in terms of etiology, pathogenesis, clinical manifestation and laboratory diagnosis.
2. Describe location of parathyroid glands and importance of their location in surgery
3. Laboratory and radiological manifestation of parathyroid disease
4. Explain relationship between parathormone, Vitamin D and calcium
5. Describe renal diseases as cause and manifestation of parathyroid disease
6. Compare and contrast parathyroid hyperplasia versus parathyroid adenoma
7. Explain the etiology, pathogenesis and manifestations of hypoparathyroidism in children
8. Carry out the epidemiological surveys of Calcium & vitamin D deficiency, Rickets and Osteomalacia in the population

THEME-4

At the end of the module students will in-sha-Allah be able to:

1. Enlist the common diseases of exocrine and endocrine pancreas
2. Explain etiology, pathogenesis, manifestations and laboratory diagnosis of acute pancreatitis
3. Give causes, manifestations and close mimickers of chronic pancreatitis
4. Give descriptions of tumors of exocrine and endocrine pancreas in terms of their nomenclature, morphology, manifestations, laboratory diagnosis and management

THEME-5

At the end of theme student will be able to:

1. Describe the pathogenesis, clinical features, diagnostic modalities and management of Cushing syndrome and adrenal insufficiency.
2. Describe congenital adrenal hyperplasia in terms of etiology, clinical features and lab diagnosis.
3. Enumerate different types of adrenal tumors along with clinical features and lab diagnosis.

THEME-6

At the end of the theme students will be able to:

1. Explain the relationship of adrenal glands with stress
2. Explain the coordination between adrenal cortex and medulla with respect to stress.
3. Discuss the mechanism of adrenal hemorrhage in terms of etiology and manifestations
4. Discuss Water house Fredriksson syndrome
5. Explain Acute and Chronic adrenal insufficiency
6. Describe Cushing Syndrome, Conns Syndrome and virilization in terms of, etiology, pathogenesis, manifestation, diagnosis
7. Define and explain adrenogenital syndrome.
8. Enumerate tumors of adrenal gland and their gross and microscopic features
9. Compare and contrast neuroblastoma and pheochromocytoma
10. Discuss endocrine gonads
11. Enlist gonadal cells, hormones and their manifestations
12. Enlist endocrine tumors of gonads
13. Define and explain polycystic ovarian syndrome, it management and manifestations.
14. Infertility: (Community Medicine) Insert from community medicine
15. Definition, causes, diagnostic tools counseling of infertile couple

PBL-1

A 50 year old man reports to his physician that she has noted coarsening of his facial structures over several years. He also reports low libido, vision loss , headache and decreased energy. Physical examination reveals frontal bossing and enlarged hands. No history of any major illness in the past.
He does not follow any particular diet.
Sleep patterns: The boy sleeps approximately eight hours nightly.
No history of any major illness in the family.
He belongs to poor socioeconomic class.
CNS: Normal
Psych: Patient feels a little bit depressed
General physical examination
Overweight
Temperature: 98.6F
Pulse: 82 bpm with normal peripheral pulses
Respiration: 18 pm
Blood Pressure: 170/100 mmHg
Weight: 100 kg
Height: 5 feet 6 inches
General Appearance: Oriented to person, place and time, bit anxious.
Musculoskeletal: Enlarged jaw and enlarged, swollen hands and feet
Neck: Thyroid enlarged, trachea central,
CVS: jugular venous distention, no carotid bruit, S1 and S2; but tachycardia with gallop rhythm.

Respiration: Normal shape chest, equal movements bilaterally, with vesicular breathing, no added sound
GIT: flat, non-tender to palpation; no masses; no hepatosplenomegaly, bowel sound present
CNS: visual field defects bitemporally

Learning Resource & Reference Books:

- Robin's textbook of pathology
- Medscape.com.Harrison's principle of internal medicine by Weiner, Fauci Braunwald Kasper Hauser Longo
- Basic and Clinical Pharmacology by Katzung BG, Masters SB, Trevor AJ
- Katzung & Trevor's Pharmacology by Trevor AJ, Katzung BG, Kruidering
- Lippincott's Illustrated Reviews: Pharmacology, Clark MA, Finkel R, Rey JA, Whalen K
- Goodman & Gilman The Pharmacological Basis of Therapeutics, Brunton LL

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Schedule for Endocrine Module –4th Year

WEEK-1

DATE					
TIME	**MONDAY**	**TUESDAY**	**WEDNESDAY**	**THURSDAY**	**FRIDAY**
8:00am-9:00am	**LGIS** Iodine Deficiency Disorder (Epidemiology, effect, prevention **Dr. Murtaza/ Dr. Uzma**	**LGIS** Radiology in Eye **Dr. Shaukat Dar**	**LGIS** Supracellular Tumors **Dr. Anwar**	**LGIS** Diabetic Emergencies & Ketoacidosis **Dr. Munazzah**	**LGIS** MEN Syndrome **Dr. Wafa Omer**
9:00am-10:00am	**LGIS** Growth Disorders; Endocrine & Non-Endocrine Considerations **Dr. Mateen**	**LGIS** Surgical Aspects of Thyroid Cancer **Dr. Farooq Kayani**	**LGIS** Surgical Aspects of Pituitary Tumors-I **Dr. Liaqat**	**LGIS** Paraneoplastic Syndrome **Dr. Anwar Ul Haque**	**LGIS** Adrenal Cortical Tumors **Dr. Anwar Ul Haque**
TEA BREAK (10:00am - 10:30am)					
10:30am - 12:30pm 12:30pm - 1:30pm	**CLINICAL ROTATION**	**CLINICAL ROTATION**	**CLINICAL ROTATION**	**CLINICAL ROTATION**	**LGIS** Acute Pancreatitis **Dr. Abdul Khalid Awan**
Lunch Break (1:30-2:00)					
2:00pm-3:00pm	**LGIS** Hemochromatosis **Dr. Malik Mahmood**	**SGD** Diabetes Mellitus (Classification, Determinants Complications, Prevention & Care **Team-4 (Pharma, C.Med., F. Med**	**LGIS** Lab. Diagnosis of Endocrine Disease **Dr. Wafa Omer**	**LGIS** Pancreatic Tumors **Dr. Sarosh**	**SDL**
3:00pm-4:00pm	**LGIS** Thyroid Tumors **Dr. Sarosh**		**SDL**	**SDL**	

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Schedule for Endocrine Module –4th Year

WEEK-2

DATE					
TIME	**MONDAY**	**TUESDAY**	**WEDNESDAY**	**THURSDAY**	**FRIDAY**
8:00am-9:00am	**LGIS** Pheochromocytoma **Dr. Tahir Aziz**	**SGD** Pathogenesis & Diagnostic Criteria of Diabetes Mellitus **Team-3**	**LGIS** Surgical Aspects of Breast Cancer **Dr. Naheed**	**LGIS** Non-Conventional Endocrine Tumors **Dr. Anwar**	**PBL-1B**
9:00am-10:00am	**LGIS** Neuroblastoma **Dr. Javed Rathore**	**Wrap-up** **Dr. Wafa**	**LGIS** Pain Lower Abdomen **Maj. Dr. Shahid**		
TEA BREAK (10:00am - 10:30am)					
10:30am - 11:30pm	**CLINICAL ROTATION**	**CLINICAL ROTATION**	**CLINICAL ROTATION**	**CLINICAL ROTATION**	**LGIS** Prevention of Diabetes Mellitus **Birg® Ahmed Khan/ Dr. Uzma**
11:30am - 12:30pm					**LGIS** Surgical Management of Pheochromocytoma **Dr. Adnan Mehraj**
12:30am - 1:30pm					SDL
Lunch Break (1:30-2:00)					
2:00pm-3:00pm	**PBL-1A**	**SGD** Disorders of Calcium & Vitamin D **Team-3**	**Practical Pathology** **Team-3**	**Skill Lab** Counsel an Infertile Couple **Dr. Ayasha**	**SDL**
3:00pm-4:00pm	**SDL**	**Wrap-up** **Maj. Dr. Sobia Irum**			

Inquires & trouble shooting
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