2.5.5

AETCOM COMPETENCIES

AETCOM Competencies for First MBBS

Subject	Competency Number	Competency
Anatomy	Module 1.5	The cadaver as our first teacher Demonstrate respect and follow the correct procedure when handling cadavers and other biologic tissue
	Module 1.1	Identify, discuss Physician's role and responsibility to society and the community that she/he serves
Physiology	Module 1.2, Module 1.3	Demonstrate empathy in patient encounters
	Module 1.4	Demonstrate ability to communicate to patients in a patient, respectful, non- threatening, non-judgmental and empathetic manner
Biochemistry	Module 1.1,	Enumerate and Describe the role of a physician in health care system
	Module 1.1	Describe and discuss the commitment to lifelong learning as an important part of physician growth

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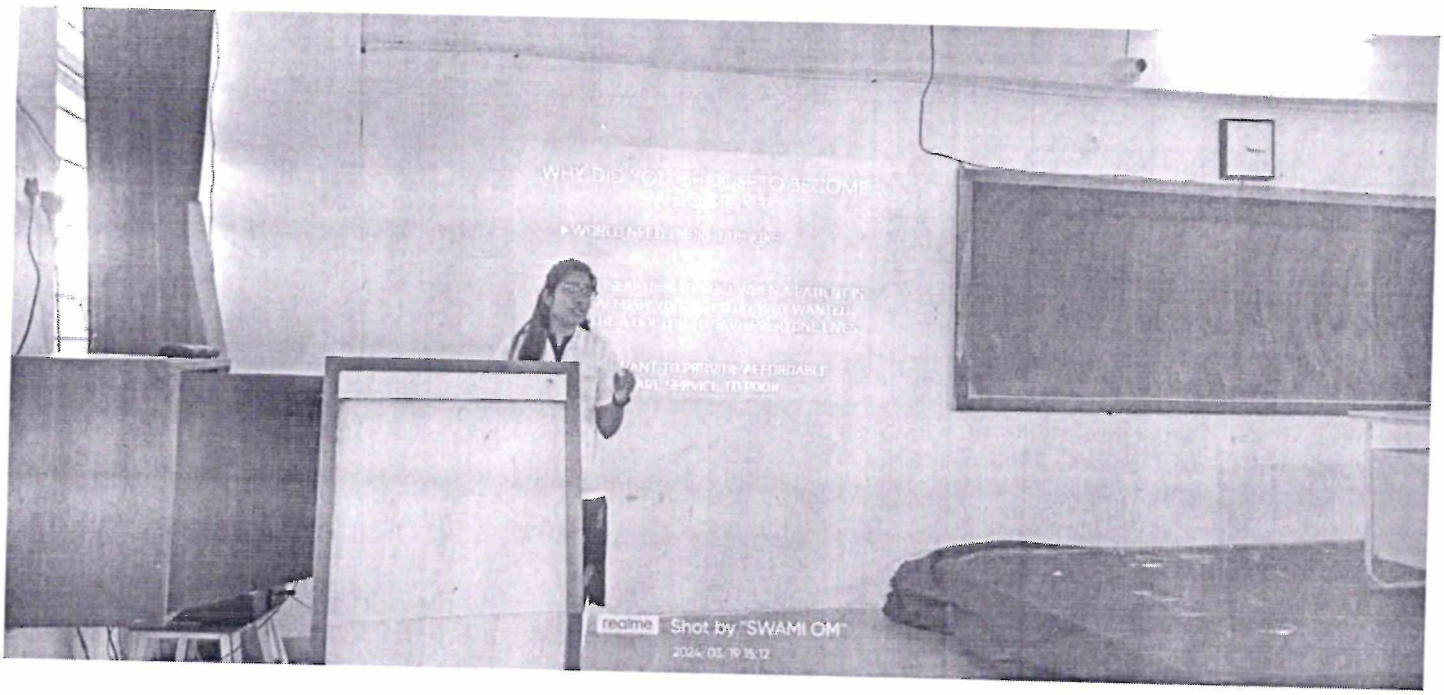

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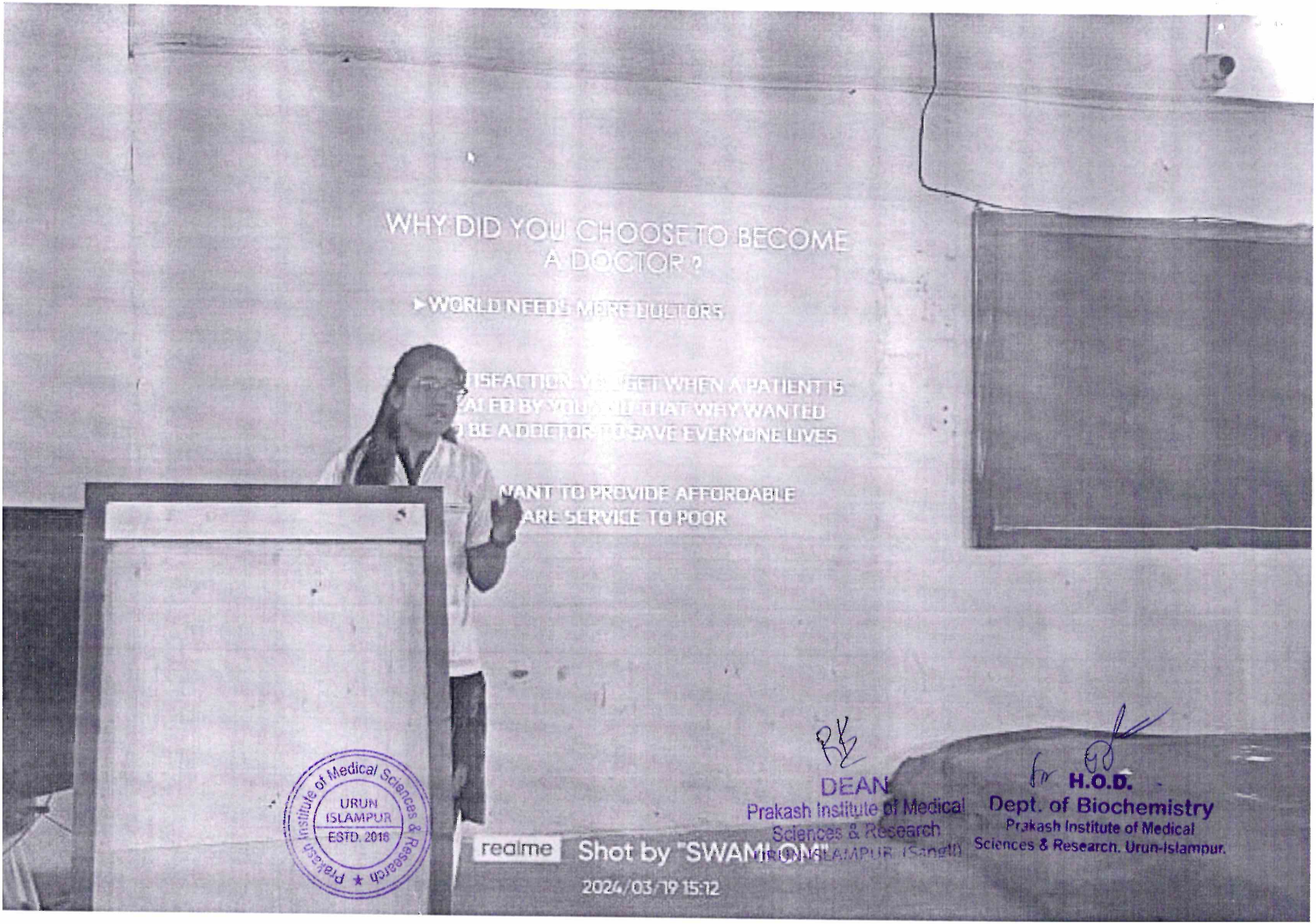

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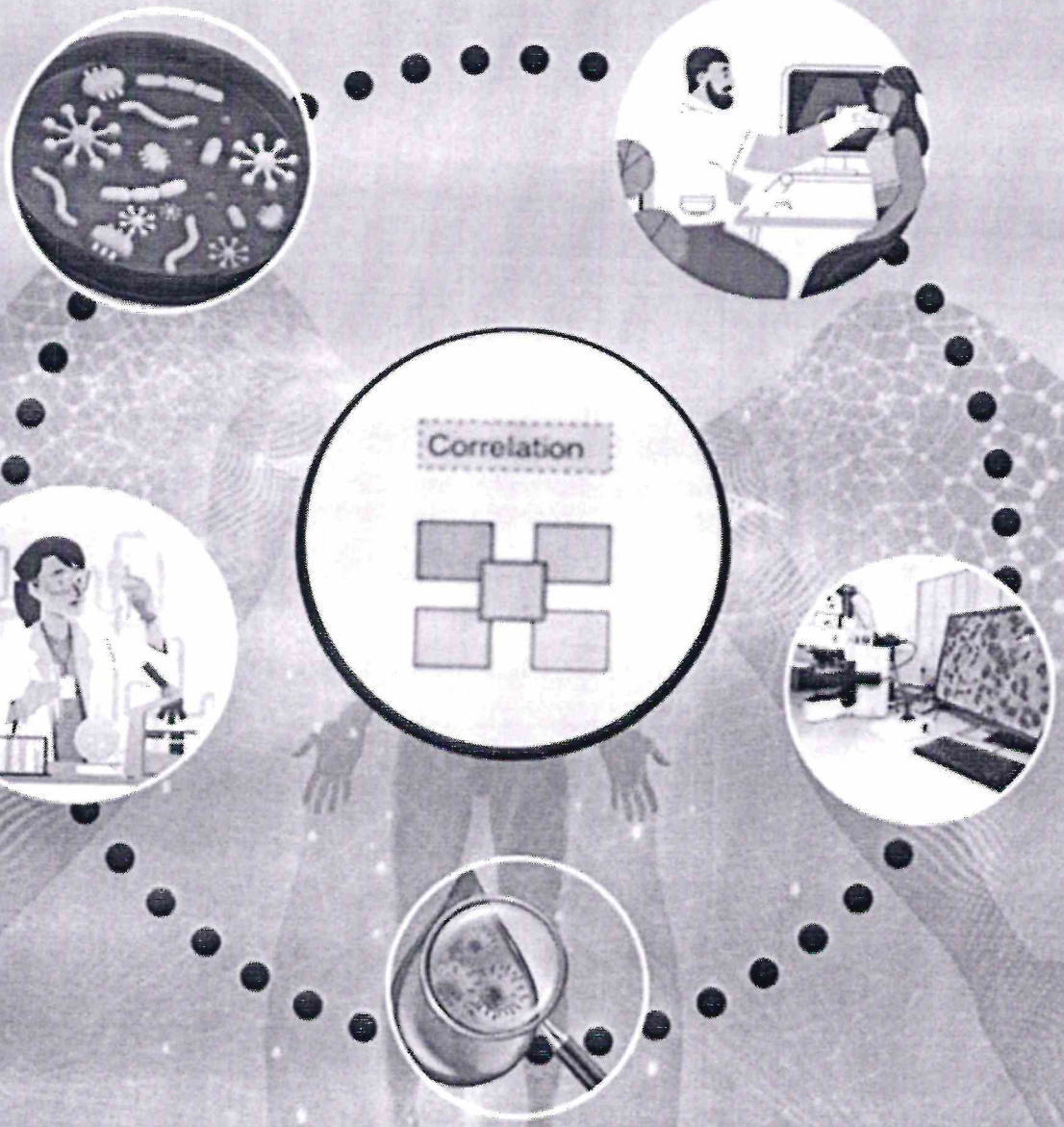
LINKER CASES

Integrated Teaching in CBME curriculum



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The contribution of Dr. Shiba Ansari and Dr. Somdatta Patra in the final revision and proofreading is immense and praiseworthy. I am also indebted to Dr. Shimpy Gupta for designing the cover page, which beautifully captures the essence of the linker cases.

I am grateful to everyone who contributed their expertise, insights, and time to this project.

This book would not have been possible without the collaborative spirit and contributions of each individual involved. Thank you all for being part of this journey.

Farah Khaliq

Dr. Farah Khaliq

Chairperson, Alignment and Integration Committee, UCMS, Delhi.

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Introduction to Terms

Alignment and integration are integral components of competency-based medical education, facilitating the coherent development of learners' skills and abilities across educational stages. The methods suggested by the National Medical Commission (NMC) India provide a framework for fostering alignment and integration within medical curricula, ultimately enhancing the preparedness of medical graduates for clinical practice and improving healthcare outcomes. By prioritizing alignment and integration, medical education can effectively respond to the dynamic demands of the healthcare landscape, producing competent and compassionate healthcare professionals.

Alignment implies the teaching of subject material that occurs under a particular organ system/disease concept from the same phase in the same time frame i.e., temporally. Alignment is recommended for most of the curriculum allowing similar systems or topics in different subjects to be learned separately but during the same time frame. Aligning could be done as an organ system-based topic/disease-based or both. If desired, the major alignment can be organ system-based with the incorporation of some specific topics that will lend itself to integration.

Integration implies that concepts in a topic/organ system that are similar, overlapping, or redundant are merged into a single teaching session in which subject-based demarcations are removed. It is a learning experience that allows the learner to perceive relationships from blocks of knowledge and develop a unified view of its basis and its application. The GMER 2019 applies these principles to the extent that will retain the strengths of subject-based education and assessment while providing experiences that will allow learners to integrate concepts.

Aligned and integrated topics (AITo).

Aligned and integrated topics in competency-based medical education encompass a range of subjects and themes that are interconnected and mutually supportive in facilitating the achievement of predefined competencies. These topics are carefully selected and structured to ensure coherence and continuity throughout the educational curriculum.

In each AITo of the phase, it is important to review competencies from the previous phase that will bear reinforcement in the current phase. Similarly, it is important to ensure that competencies in the next higher phases are reviewed to explore if some of these require

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introduction in this phase. Integration sessions allotted in each phase may be used to deliver these competencies.

a. By reviewing objectives/competencies in a phase, redundant ones and those in each subject that can be taught together without a subject demarcation can be identified for horizontal integration (**Sharing**).

b. Similarly, by reviewing objectives or competencies across phases, those with a common thread can be identified for vertical integration (**Nesting and Correlation**).

The Integration concepts framed in the GMER 2019 are explained in Figure 1.

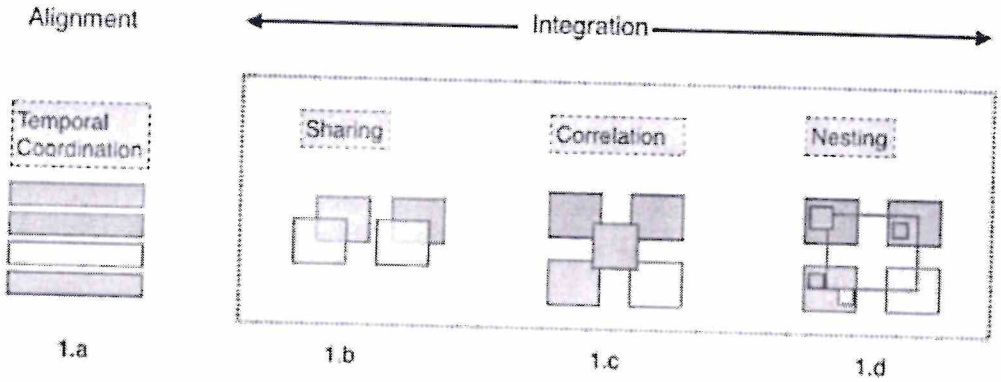

Figure 1: Integration concepts framed in the GMER 2019. Coloured boxes represent subjects. **1a. Alignment** - Temporal coordination: The timetable is adjusted so that topics within the subjects or disciplines which are related, are scheduled at the same time. **1b. Sharing**: Two disciplines may agree to plan and jointly implement a teaching program. **1c. Correlation**: The emphasis remains on disciplines or subjects with subject-based courses taking up most of the curriculum time. Within this framework, an integrated teaching session or course is introduced in addition to the subject-based teaching (green box with red border). **1d. Nesting:** the teacher targets, within a subject-based course, skills relating to other subjects *(Adapted from Harden R Med Edu 2000. 34: 551).*

Linker is a session that allows that aptly links the various related stand-alone elements represented in an AITo and helps Correlate. In the medical curriculum, the linker is most commonly a case that is creatively written and can be used in each phase (often the same case) to allow students to correlate what they have learned and apply it to understanding the disease process, diagnosis, and care. Using the case discussion at different time points in AITo will allow students to reinforce and link concepts appropriately.

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ANEMIA: LINKER CASE

Team Leader: Dr. Pragya Jain (Pathology)

Collaborating Departments

Physiology, Biochemistry, Pathology, Pharmacology, Community Medicine, General Medicine, Obstetrics & Gynaecology, Paediatrics, Microbiology

Patient profile and history:

Kavita, a 30-year-old female (G4P3L3A0), 30 weeks pregnant, homemaker presented to the antenatal clinic at Kalyanpuri with complaints of easy fatiguability, breathlessness, and lethargy for 2 months. She is a resident of Kalyanpuri and her husband is a daily wages labourer. She had two antenatal visits at the dispensary and received tetanus toxoid. She was given tablets which she didn't take as she vomited after taking those medicines.

Past obstetric history: She had 3 full-term vaginal deliveries at home in the village. No antenatal care was received in any previous pregnancies. The last childbirth was 2 years back.

No history of any contraceptive use.

Dietary history: Based on her dietary history, her daily energy intake was estimated to be 1700 Kcal with 30 gm of proteins approximately.

Physical Examination:

Her body weight was 45 Kg. She was pale and lethargic. The lower palpebral conjunctiva was pale (Figure 1). Pulse rate was 100 beats/ min. There was no icterus and clubbing. Pedal oedema was present .

Cardiac examination/ Respiratory examination: normal (No murmur present)

Abdominal examination:

Abdomen was distended. Fundal height was 28 weeks

Single fetus in a longitudinal lie with cephalic presentation.

Fetal heart sound: 140 beats/ min.

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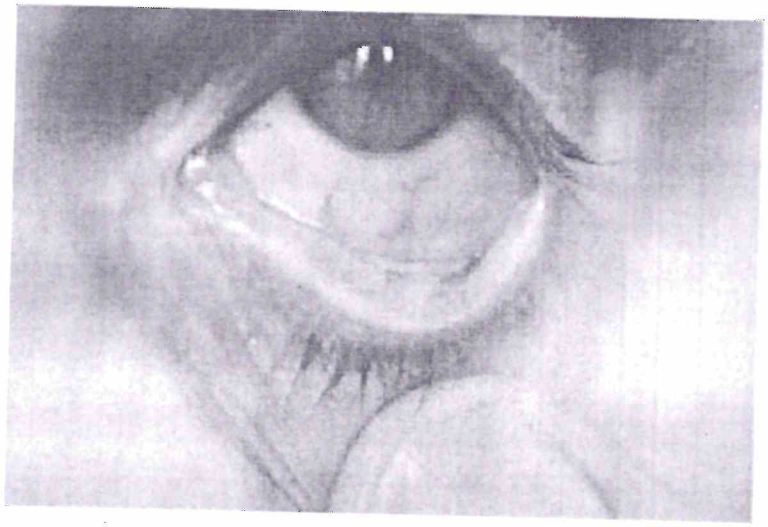

Figure 1. *Source Ref: J Gen Intern Med. 1997;12(2):102-106.*

Laboratory Examination

Hemoglobin: 8 gm/dL

MCV: 60 fl

MCH: 20 pg

MCHC: 23 gm/dL

Serum iron: 20 ng/mL

Ferritin: 10 ng/mL

TIBC: 500

Transferrin saturation: 5.1%

TLC: 6000 /mm^3

Platelet count: 3.2 lakh/mm^3

LFT: Total serum Bilirubin/ Direct Bil: 0.8 mg/dL/ 0.4 mg/dL

Peripheral smear: RBCs are microcytic hypochromic with the presence of poikilocytes in the form of elongated cells and leptocytes (Figure 2). Platelets are abundant.

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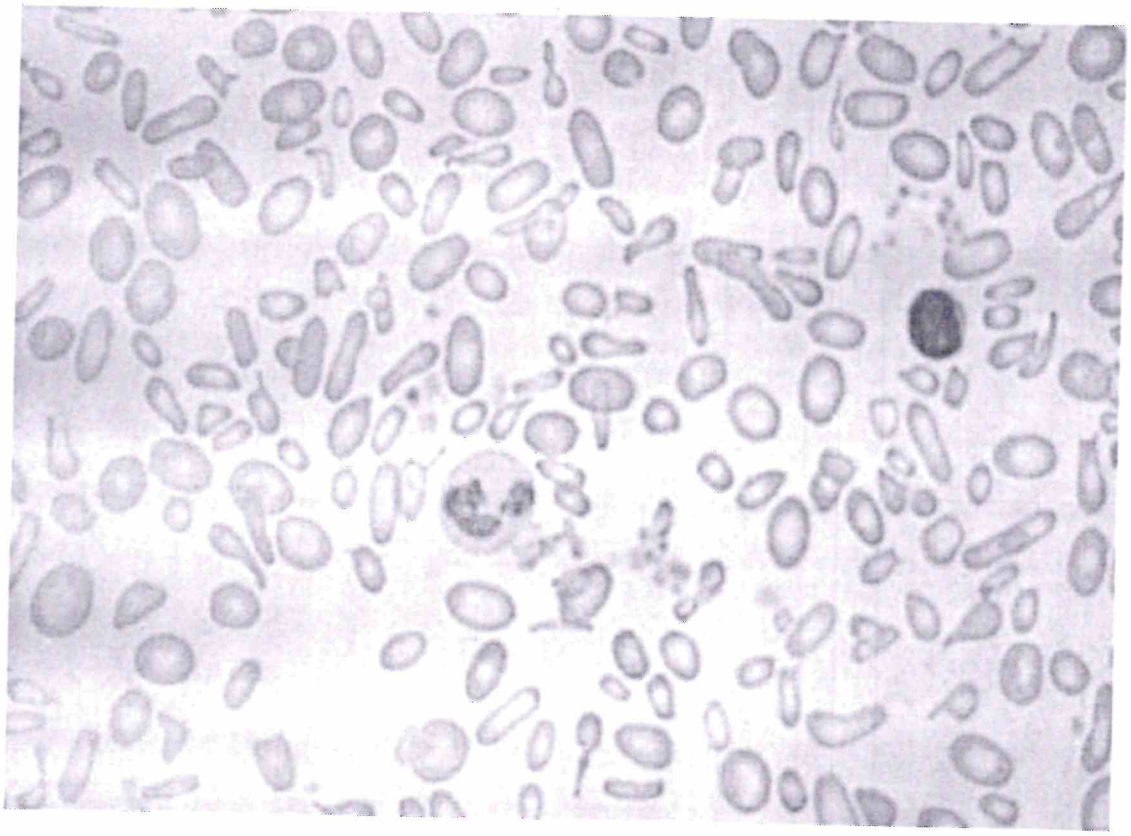

Figure 2. *Source Ref: www.jkscience.org.Vol. 19 No. 2, April.-June 2017*

INTEGRATION

Physiology (PY2)

PY2.3: Describe and discuss the synthesis and functions of Haemoglobin and explain its breakdown. Describe variants of haemoglobin.

Specific Learning Objectives:

- Understanding Hemoglobin Synthesis.
- Explaining Hemoglobin Structure and Function
- Discuss the binding of oxygen to hemoglobin and the cooperative binding effect.
- Discussing Hemoglobin Variants- the genetic basis and consequences of hemoglobin variants, such as sickle cell anemia (HbS) or thalassemia.
- Understanding Hemoglobin Breakdown.
- Apply knowledge of hemoglobin variants to understand clinical conditions and diagnostic methods related to hemoglobinopathies.

PY2.4: Describe RBC formation (erythropoiesis & its regulation) and its functions.

Specific Learning Objectives:

- Understanding Erythropoiesis:
- Explaining Regulation of Erythropoiesis:
- Describing Red Blood Cell Functions:
- Analyze how disruptions in erythropoiesis can lead to anemia or erythrocytosis and their associated symptoms.

PY2.5 Describe different types of anemia & Jaundice.

Specific Learning Objectives:

- Define Anemia
- Classify Anemia Based on Etiology
- Explain the common signs and symptoms associated with anemia.
- Identify laboratory tests used to diagnose and classify different types of anemia.
- Outline general management approaches for anemia.

PY2.11: Estimate Hb, RBC, TLC, RBC indices, DLC, Blood groups, BT/CT.

Specific Learning Objectives:

- Understand the principle and procedure of hemoglobin estimation, RBC, TLC, RBC indices, DLC, Blood groups, BT/CT.
- Interpret values and understand their clinical significance in diagnosing anemia or polycythemia.
- Relate the results of hematological tests to various clinical conditions.

Biochemistry (BI6)

BI6.9: Describe the functions of various minerals in the body, their metabolism, and homeostasis.

BI6.10: Enumerate and describe the disorders associated with mineral metabolism

BI6.12: Describe the major types of hemoglobin and its derivatives found in the body and their physiological/ pathological relevance.

Specific Learning Objectives:

- Discuss Hemoglobin structure, function (role of iron in hemoglobin synthesis) and metabolism .
- Abnormal hemoglobin forms leading to anemia - Thalassemia and Sickle cell anemia.
- Iron as a micro mineral in Nutrition: Food sources, Absorption, Storage, Transport, Diseases associated with deficiency and excess.
- Interpretation of iron profile : TIBC, serum iron, ferritin, transferrin
- Regulation of iron homeostasis in the body and role of Hepcidin
- Discussion on dietary vitamin deficiencies (such as Vitamin B12, folate, vitamin B6) leading to nutritional anemias.

Pathology (PA13,14)

PA13.3: Define and classify anemia.

PA13.4: Enumerate and describe the investigation of anemia.

PA13.5: Perform, Identify, and describe the peripheral blood picture in anemia.

PA14.1:: Discuss in detail iron metabolism.

PA14.2: Describe the etiology, investigation and differential diagnosis of microcytic hypochromic anemia.

PA14.3: Identify and Describe the peripheral smear in microcytic hypochromic anemia.

Pharmacology (PH 1.35)

PH1.35: Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of drugs used in hematological disorders like:

1.Drugs used in anemias

2.Colony Stimulating factors

Specific Learning Objectives:

- Discuss various therapies indicated to restore iron in the body.
- Describe in detail the mechanism of action of various drugs that are indicated in this scenario.

Community Medicine (CM 5)

CM 5.3: Define and describe common nutrition-related health disorders (including macro-PEM, Micro-iron, Zn, iodine, Vit. A), their control and management.

CM 5.5: Describe the methods of nutritional surveillance, principles of nutritional education, and rehabilitation in the context of socio-cultural factors.

CM 5.6: Enumerate and discuss the National Nutrition Policy, important national nutritional Programs including the Integrated Child Development Services Scheme (ICDS), etc.

Specific Learning Objectives:

- Outline the public health challenges associated with anemia in densely populated urban slums.
- Discuss the community-based interventions be implemented in the population to prevent anemia.
- Discuss the importance of health education and awareness in generations in preventing and managing iron deficiency anemia.
- Discuss the national community program in iron deficiency anemia.

General Medicine (IM9)

IM9.1: Define, describe and classify anemia based on red blood cell size and reticulocyte count.

IM9.2: Describe and discuss the morphological characteristics, aetiology and prevalence of each of the causes of anemia.

IM9.3: Elicit document and present a medical history that includes symptoms, risk factors including GI bleeding, prior history, medications, menstrual history, and family history.

IM9.4: Perform a systematic examination that includes : general examination for pallor, oral examination, DOAP session of hyperdynamic circulation, lymph node and splenic examination.

IM9.5: Generate a differential diagnosis and prioritise based on clinical features that suggest a specific aetiology.

IM9.6: Describe the appropriate diagnostic work up based on the presumed aetiology.

IM9.7: Describe and discuss the meaning and utility of various components of the hemogram.

IM9.8: Describe and discuss the various tests for iron deficiency.

IM9.9: Order and interpret tests for anemia including hemogram, red cell indices, reticulocyte count, iron studies, B12 and folate.

IM9.10: Describe, perform and interpret a peripheral smear and stool occult blood.

IM9.11: Describe the indications and interpret the results of a bone marrow aspirations and biopsy.

IM9.12: Describe, develop a diagnostic plan to determine the aetiology of anemia.

IM9.13: Prescribe replacement therapy with iron, B12.

IM9.14: Describe the national programs for anemia prevention.

IM9.15: Communicate the diagnosis and the treatment appropriately to patients.

IM9.16: Incorporate patient preferences in the management of anemia.

IM9.17: Describe the indications for blood transfusion and the appropriate use of blood components.

IM9.20: Communicate and counsel patients with methods to prevent nutritional anemia.

Obstetrics and Gynaecology (OG 12.2)

OG 12.2: Define, classify and describe the etiology, pathophysiology, diagnosis, investigations, adverse effects on the mother and foetus and the management during pregnancy and labor, and complications of anemia in pregnancy.

Specific Learning Objectives:

- Discuss the obstetric complications of iron deficiency anemia.
- Discuss in detail the obstetric work up of the case.
- Discuss in detail the therapies to be given in this pregnant female.
- Discuss in detail the treatment plan and antenatal care implicated.

Pediatrics (PE 13)

PE13.1: Discuss the RDA, dietary sources of Iron and their role in health and disease.

PE13.2: Describe the causes, diagnosis and management of Fe deficiency.

PE13.3: Identify the clinical features of dietary deficiency of Iron and make a diagnosis.

PE13.4: Interpret hemogram and Iron Panel.

PE13.5: Propose a management plan for Fe deficiency anaemia.

PE13.6: Discuss the National anaemia control program and its recommendations.

PE29.19: Counsel and educate patients about prevention and treatment of anemia

Specific Learning Objectives:

- What are the dangerous complications of iron deficiency anemia in mother to neonate.
- Discuss the preventive measure to prevent sequelae in neonate.

Microbiology (MI2.4)

MI2.4: List the common microbial agents causing anemia. Describe the morphology, mode of infection and discuss the pathogenesis, clinical course, diagnosis, and prevention and treatment of the common microbial agents causing anemia.

Specific Learning Objectives:

- Describe in brief the life cycle of parasitic agents causing anemia.
- Describe the morphology, mode of infection and discuss the pathogenesis, clinical course, diagnosis, and prevention and treatment of the common microbial agents causing anemia.

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TUBERCULOSIS: LINKER CASE

Team Leader: Dr. Pragti Chhabra (Department of Community Medicine)

Collaborating Departments

Physiology, Pathology, Microbiology, Pharmacology, Community Medicine, Respiratory Medicine, Paediatrics, Obstetrics and Gynaecology, Orthopaedics, Radiology

Patient Profile and History

Mr Lalit Kumar, a 50-year-old male, resident of an urban area, factory worker by occupation, and non-smoker, presented to the Health Center with complaints of fever and cough with expectoration for a duration of four weeks. The fever was low grade and felt more in the evening. The expectoration was small in quantity and yellowish in colour. For the past two days he noticed streaks of blood in his sputum. He also complained of progressive shortness of breath, decreased appetite, and night sweats.

Physical Examination

The pulse rate was 102 per min., temperature was 38°C, blood pressure was 110/70 mm Hg, and respiratory rate of 18 per min. He had mild pallor and his weight was 51 kg. On chest examination, he had crepitations in the right infraclavicular region.

He was advised to give a sputum sample for examination for Acid Fast Bacilli (AFB) to the Laboratory on the same day and another one on the next day and prescribed Amoxycillin capsules. A blood count with biochemistry investigations (random blood glucose test, liver function test and kidney function test) were ordered. In view of hemoptysis, he was also advised to get a chest radiograph from the district hospital nearby.

Investigations

Hb-10.5gm/dL, TLC-8600 per microlitre, DLC_ P61 L34 E3 M2, ESR-66 mm/hr.

Blood glucose levels, LFT and KFT parameters were within the normal reference range.

The chest radiograph revealed nodular shadows in the right upper zone with a small thick-walled cavity (Figure 1).

The sputum smear samples were reported as positive for AFB (Figure 2) .

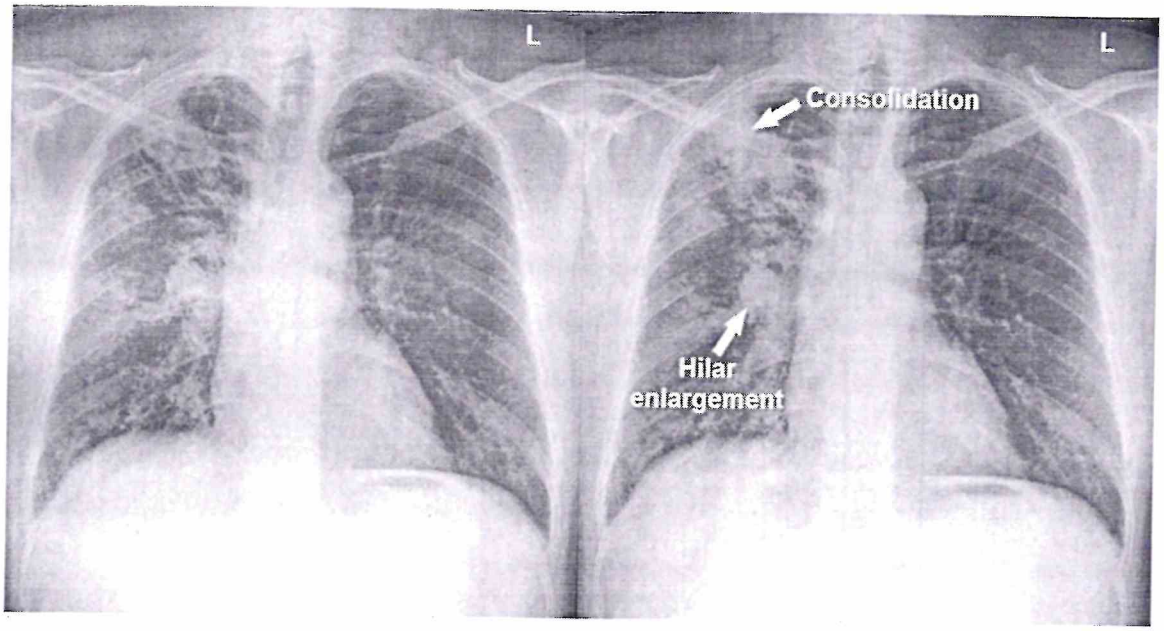

Figure 1. *Source Ref: https://www.radiologymasterclass.co.ik/gallery/chest/pulmonary-disease/tuberculosis_tb*

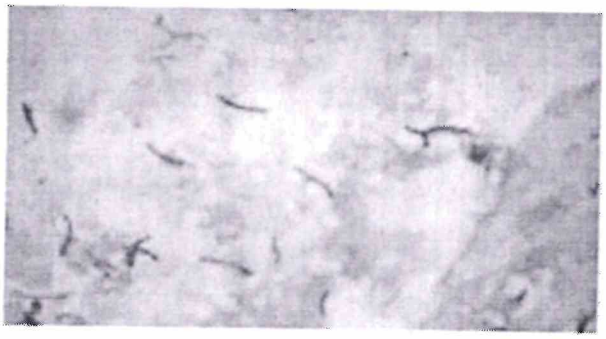

Figure 2. *Source Ref: https://microbeonline.com/ziehl-neelsen-technique-principle-procedure-reporting/*

Diagnosis

A diagnosis of Pulmonary Tuberculosis was made based on the symptoms, result of sputum smear examination and a chest radiograph picture.

He was referred to the DOTS center for the management of Tuberculosis. At the DOTS center, an HIV test was obtained after counseling and a sputum sample was sent for CBNAAT at the District Hospital. He tested negative for HIV and the CBNAAT report was positive for mycobacterium tuberculosis with no resistance to rifampicin. He was started on anti-tubercular treatment with Rifampicin, Isoniazid, Ethambutol and Pyrazinamaide in doses as per his weight. He followed up the treatment at the DOTS center as per the instructions.

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Case History of other family members

His son (28 years old) and daughter in law (25 years old) married for 7 years and staying with him in the same house, complained of inability to conceive. None of them had any symptoms suggestive of active pulmonary tuberculosis. During workup for primary infertility it was found that the female also complained of decreased blood flow during menstruation for the last one year.

Physical examination findings were normal.

Investigations:

Husband's Semen Analysis: 25 million sperms /mL, 70% motile

Wife's Investigations:

CBC, TSH, Prolactin: Normal

USG (TVS): Uterus normal, Endometrium: irregular, thin and very echogenic, B/L Ovaries normal.

X ray chest: old lesion suggestive of past tuberculosis

Premenstrual Endometrial Biopsy: AFB smear & TB Culture: negative

HPE: Granulomatous endometritis

INTEGRATION

Physiology (PY 6.1)

PY 6.1: Discuss the functional anatomy of the respiratory tract

Specific Learning Objectives:

- Reasons for the apical predilection of Tuberculosis infection
- Effect of tuberculosis on blood gas exchange

Pathology (PA 10.1, 19, 24 & 26)

PA 10.1: Define and describe the pathogenesis and pathology of common bacterial, viral, protozoal and helminthic diseases.

Specific Learning Objectives:

- Describe the pathogenesis and pathology of tuberculosis
- Describe the Histo pathological characteristics of Tubercular lesions

PA 19.2: Describe the pathogenesis and pathology of tuberculous lymphadenitis

PA 19.3; Identify and describe the features of tuberculous lymphadenitis in a gross and microscopic specimen

PA 24.5: Describe the etiology, pathogenesis and pathologic features of Tuberculosis of the intestine

PA 26.4: Define and describe the etiology, type, pathogenesis, stages, morphology and microscopic appearance and complications of tuberculosis.

Microbiology (MI 1, 3, 16, 18)

MI 1.1: Describe the different causative agents of Infectious diseases, the methods used in their detection, and discuss the role of microbes in health and disease

(Describe various Mycobacterium. Classify mycobacteria of clinical importance)

MI 1.2: Perform and identify the different causative agents of Infectious diseases by Gram Stain, ZN stain and stool routine microscopy

Specific Learning Objectives:

- Perform ZN stain and identify Mycobacterium

MI 3.1: Describe the epidemiological basis of common infectious diseases

Specific Learning Objectives:

- Describe the epidemiological basis of tuberculosis

MI 1.6: Describe the mechanisms of drug resistance, and the methods of antimicrobial susceptibility testing and monitoring of antimicrobial therapy.

Specific Learning Objectives:

- Describe the mechanisms of drug resistance,
- Describe the methods of antimicrobial susceptibility testing and monitoring of antimicrobial therapy in tuberculosis

MI 1.7: Describe the immunological mechanisms in health

Specific Learning Objectives:

- Describe the immunological response in tuberculosis

MI 1.8: Describe the mechanisms of immunity and response of the host immune system to infections.

Specific Learning Objectives:

- Describe the mechanisms of immunity and response of the host immune system to tuberculosis infection

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MI 1.9: Discuss the immunological basis of vaccines and describe Universal Immunisation Schedule

Specific Learning Objectives:

- Discuss the immunological basis of the BCG vaccine

MI 16.1: Identify the common etiologic agents of lower respiratory tract infections (Gram Stain & Acid fast stain)

Specific Learning Objectives:

- Identify mycobacterium by acid fast stain

MI 18.10: Demonstrate the appropriate method of collection of samples in the performance of laboratory tests in the detection of microbial agents

Specific Learning Objectives:

- Demonstrate the appropriate method of collection of sputum sample for detection of Mycobacterium tuberculosis

MI 18.13: Choose the appropriate laboratory test in the diagnosis of the infectious disease

Specific Learning Objectives:

- Discuss the various Laboratory tests for the diagnosis for Tuberculosis
    a. Montoux Test
    b. Sputum smear examination
    c. Culture techniques for mycobacteria
    d. Molecular diagnostic techniques

MI 18.16: Choose and Interpret the results of the laboratory tests used in diagnosis of the infectious disease

Specific Learning Objectives:

- Choose and interpret the results of the laboratory tests used in the diagnosis of pulmonary tuberculosis and extra pulmonary tuberculosis

Pharmacology (PH 1)

PH 1.44: Describe the first line anti-Tuberculosis drugs, their mechanism of action, side effects and doses.

PH 1.45: Describe the drugs used in MDR and XDR tuberculosis.

Specific Learning Objectives:

- Describe the Mechanism of action, Pharmacokinetics and Adverse drug reaction of First line Drugs used in MDR and XDR tuberculosis.

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- Describe the Mechanism of action, pharmacokinetics and adverse drug reaction of second line drugs

PH 1.55: Describe and discuss the National Health Programmes-

Specific Learning Objectives:

- Describe the principles and guidelines for management of Tuberculosis, Treatment regimes for drug sensitive and drug resistant tuberculosis.

Community Medicine (CM 2, 8)

CM 2.2: Describe the socio-cultural factors, family (types), it's role in health and disease.

Specific Learning Objectives:

- Describe the role of socio-cultural factors in the occurrence of tuberculosis.

CM 8.1: Describe and discuss the epidemiological and control measures including the use of essential laboratory tests at the primary care level for communicable diseases

Specific Learning Objectives:

- Describe the epidemiology namely the agent, host and environmental factors that play a role in the transmission of tuberculosis.

CM 8.3: Enumerate and describe disease specific National Health Programs including their prevention and treatment of a case

Specific Learning Objectives:

- Describe the objectives, goals and various strategies for control of Tuberculosis under the National Tuberculosis Elimination Programme.
- Discuss the treatment regimen of drug sensitive case in the National Tuberculosis Elimination Programme.
- Discuss the treatment regimen of drug resistant case in the National Tuberculosis Elimination Programme.
- Describe the tuberculosis preventive treatment.

Respiratory Medicine (CT 1)

CT 1.1: Describe and discuss the epidemiology of tuberculosis and its impact on the work, life and economy of India .

CT 1.2: Describe and discuss the microbiology of tubercle bacillus, mode of transmission, pathogenesis, clinical evolution and natural history of pulmonary and extra pulmonary forms including lymph node, bone and CNS.

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CT 1.3: Discuss and describe the impact of co-infection with HIV and other co-morbid conditions. Like diabetes on the natural history of tuberculosis

CT 1.4: Describe the epidemiology, the predisposing factors and microbiological and therapeutic factors that determine resistance to drugs.

CT 1.5: Elicit, document and present an appropriate medical history that includes risk factor, contacts, symptoms including cough and fever CNS and other manifestations.

CT 1.6: Demonstrate and perform a systematic examination that establishes the diagnosis based on the clinical presentation that includes a a) general examination, b) examination of the chest and lung including loss of volume, mediastinal shift, percussion and auscultation (including DOAP session of lung sounds and added sounds) c) examination of the lymphatic system and d) relevant CNS examination.

CT 1.7: Perform and interpret a PPD (mantoux) and describe and discuss the pitfalls of the test

CT 1.8: Order and interpret diagnostic tests based on the clinical presentation including: CBC, Chest X ray PA view, Mantoux, sputum culture and sensitivity, pleural fluid examination and culture, HIV testing

CT 1.10: Perform and interpret an AFB stain

CT 1.12: Enumerate the indications for tests including: serology, special cultures and polymerase chain reaction and sensitivity testing

CT 1.13: Describe and discuss the origin, indications, technique of administration, efficacy and complications of the BCG vaccine

CT 1.14: Describe and discuss the pharmacology of various anti-tuberculous agents, their indications, contraindications, interactions and adverse reactions .

CT 1.15: Prescribe an appropriate anti tuberculosis regimen based on location of disease, smear positivity and negativity and co-morbidities based on current national guidelines including DOTS.

CT 1.16: Describe the appropriate precautions, screening, testing and indications for chemoprophylaxis for contacts and health workers

CT 1.17: Define criteria for the cure of Tuberculosis; describe and recognise the features of drug resistant tuberculosis, prevention and therapeutic regimens

CT1.18: Educate health care workers on National Programs of tuberculosis and administering and monitoring the DOTS program.

CT 1.19: Communicate with patients and family in an empathetic manner about the diagnosis, therapy (AETCOM).

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Pediatrics (PE 34)

PE 34.1: Discuss the epidemiology, clinical features, clinical types, complications of Tuberculosis in children and adolescents

PE 34.2: Discuss the various diagnostic tools for childhood tuberculosis

PE 34.3: Discuss the various regimens for management of Tuberculosis as per National Guidelines

PE 34.4: Discuss the preventive strategies adopted and the objectives and outcome of the National Tuberculosis Control Program

PE 34.5: Able to elicit, document and present history of contact with tuberculosis in every patient encounter.

PE 34.6: Identify a BCG scar

PE 34.7: Interpret a Mantoux test

PE 34.8: Interpret a Chest Radiograph

PE 34.9: Interpret blood tests in the context of laboratory evidence for tuberculosis

PE 34.10: Discuss the various samples for demonstrating the organism e.g. Gastric Aspirate, Sputum , CSF, FNAC

PE 34.11: Perform AFB staining

PE 34.12: Enumerate the indications and discuss the limitations of methods of culturing Mycobaterium tuberculosis

PE34.13: Enumerate the newer diagnostic tools for Tuberculosis including BACTEC CBNAAT and their indications.

Obstetrics & Gynecology (OG 27.2)

OG 27.2: Describe and discuss the etiology, pathology, clinical features, differential diagnosis, investigations, management and long term implications of genital tuberculosis.

Specific Learning Objectives:

- Discuss the diagnosis of genital tuberculosis in females.
- Describe the various presentations of female genital tuberculosis.
- Enumerate the HSG findings in female genital tuberculosis.
- Discuss the management of infertility in female genital TB.

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Orthopedics (OR 4.1)

OR 4.1: Describe and discuss the clinical features, Investigation and principles of management of Tuberculosis affecting major joints (Hip, Knee) including cold abscess.

Radiology (RD 1.5)

RD 1.5: Enumerate indications for various common radiological investigations, choose the most appropriate and cost effective method and interpret findings in common conditions pertaining to disorder in internal medicine.

Specific Learning Objectives:

- Enumerate indications for X ray Chest in suspected case of Tuberculosis and interpret findings.

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LEPROSY: LINKER CASE

Team Leader: Dr. Chander Grover (Department of Dermatology)

Collaborating Departments

Dermatology, Anatomy, Pathology, Pharmacology, Microbiology, Community Medicine, Ophthalmology, Orthopaedics, Paediatrics

Patient profile and history:

A 45-year-old patient named Raju, farmer by occupation, presents to a local healthcare centre with loss of sensation over hands and feet. He is a resident of a rural area with a high prevalence of leprosy, who is now working in Delhi as a migrant labourer. He stays for 9-10 months in Delhi, and returns to his village for few months every year.

Clinical Presentation:

Raju complains of numbness and tingling in hands and feet for the past one year. He has noticed difficulty in gripping objects and buttoning-unbuttoning his shirt. He gives history of occasional blistering and cuts in hands and feet, which are painless. He also experiences nasal stuffiness with crusting. He has swelling of both feet off and on, which increases towards evening. He also complains of fever off and on, with evening rise of temperature, along with few painful reddish skin lesions which resolve over 2-3 days.

Examination:

The doctor assessed Raju's skin and conducted neurological examinations, identifying sensory and motor deficits. On examination, he has hypopigmented macules involving his back, buttocks and arms (Figure 1 and 2). These lesions are varying in size from 2-3 cm to 20-25 cm. The lesions have partial loss of sensation. There are a few hyperpigmented scars interspersed.

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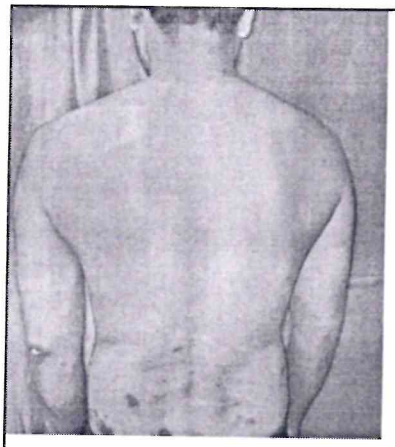

Figure 1: Hypopigmented macules involving upper back, lower back and arms.

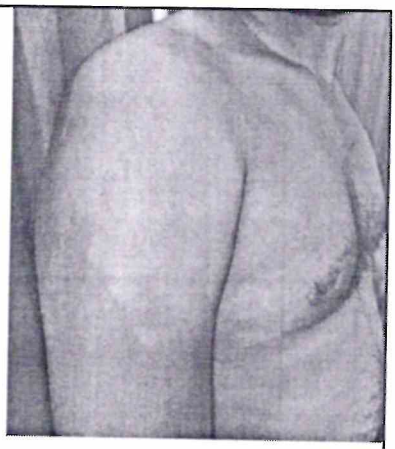

Figure 2: Hypopigmented macules involving arms and chest

Image credit: Dr. Chander Grover, Department of Dermatology, UCMS, Delhi.

He also has few erythematous plaques of varying sizes, with sensory loss (Figure 3). The sensory loss is also present over the hands and feet (Figure 4-7). Few scars of previously healed burns are present (Figure 1,4,5). There are trophic ulcers over the plantar aspect, involving pressure bearing areas (Figure 7).

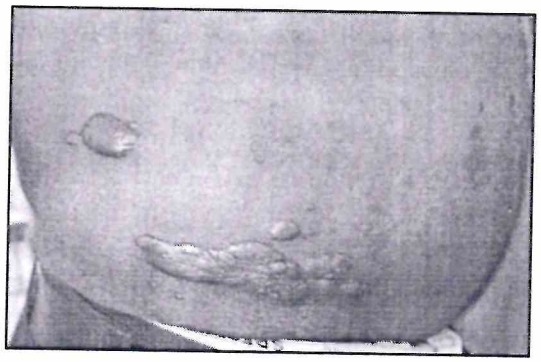

Figure 3: Erythematous plaques with sensory loss

Image credit: Dr. Chander Grover, Department of Dermatology, UCMS, Delhi.

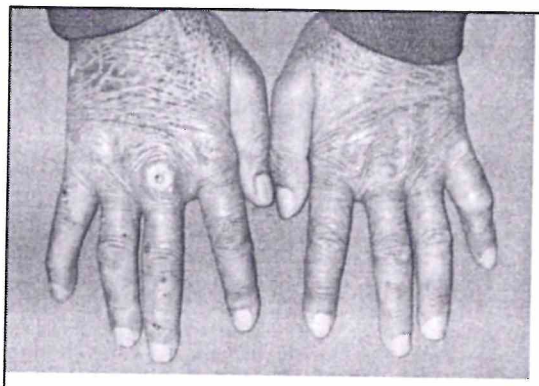

Figure 4: Dorsae of hands with xerosis and sensory loss. Healing trophic ulcer seen over knuckles. There is ulnar clawing with flexion deformity of both little fingers.

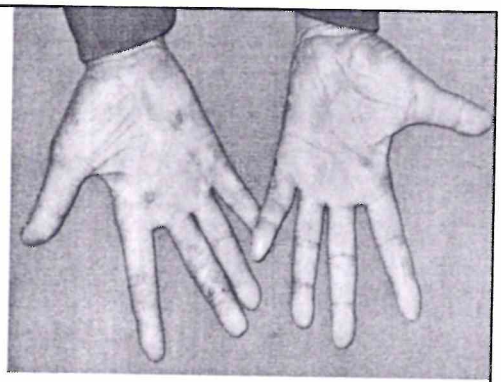

Figure 5: Palmar aspect showing xerosis and healing ulcers

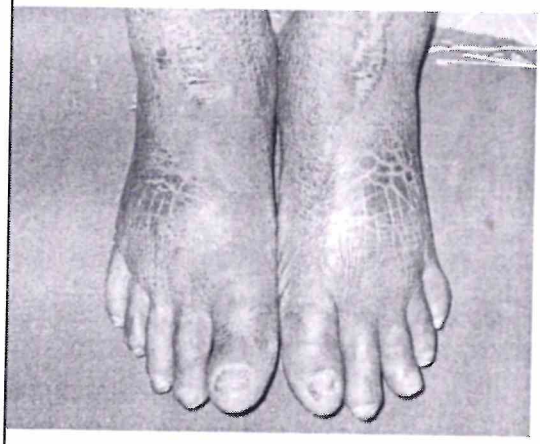

Figure 6: Dorsae of feet showing xerosis

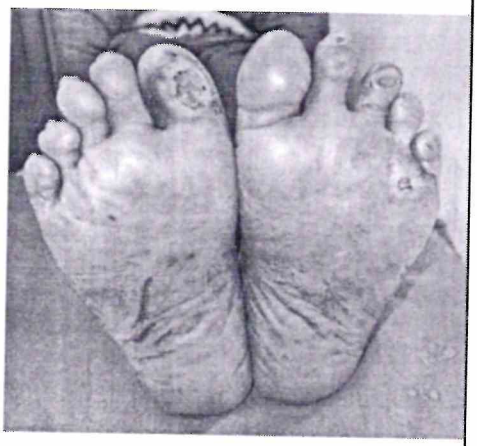

Figure 7: Plantar aspect showing multiple trophic ulcers

Image credit: Dr. Chander Grover, Department of Dermatology, UCMS, Delhi.

Multiple symmetrical nerves are enlarged and non-tender, including bilateral ulnar and bilateral common peroneal nerve. The patient also had ulnar clawing involving both hands (Figure 4,5).

Differential diagnosis:

Based on history and examination, differential diagnoses of borderline lepromatous leprosy and peripheral neuropathy were considered. A slit skin smear examination was done from both earlobes. A skin biopsy was advised.

Microbiological Findings:

A slit skin smear stained with modified Ziehl-Neelsen stain confirms the presence of acid-fast bacilli (AFB) in high power fields. The bacteriological index is 4+.

Pathological Findings:

A skin biopsy from one of the lesions reveals the presence of foamy histiocytes, a well-defined Grenz zone, as well as numerous acid-fast bacilli (AFB) on histopathological examination.

INTEGRATION

Dermatology (DR9)

DR9.1: Classify, describe the epidemiology, etiology, microbiology, pathogenesis, clinical presentations and diagnostic features of Leprosy

DR9.2: Demonstrate (and classify based on) the clinical features of leprosy including an appropriate neurologic examination

DR9.3: Enumerate the indications and observe the performance of a slit skin smear in patients with leprosy

DR9.4: Enumerate, describe and identify lepra reactions and supportive measures and therapy of lepra reactions

DR9.5: Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for various classes of leprosy based on national guidelines

DR9.6: Describe the treatment of Leprosy based on the WHO guidelines

DR9.7: Enumerate and describe the complications of leprosy and its management, including understanding disability and stigma.

Specific Learning Objectives:

- Identify signs and symptoms of Leprosy
- Examination of peripheral nerves
- Preparing a slit skin smear
- Taking a skin biopsy
- Early recognition of Leprosy reactions and need for referral to specialist care
- Early recognition of Drug adverse effects and need for referral to specialist care
- Care of anaesthetic hands and feet

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Anatomy (AN4)

AN4.2: Describe structure & function of skin with its appendages.

AN4.4: Describe modifications of deep fascia with its functions.

AN4.5: Explain principles of skin incisions.

Microbiology (MI1, 4)

MI1.2: Perform and identify the different causative agents of Infectious diseases by Gram Stain, ZN stain and stool routine microscopy.

MI4.3: Describe the etio-pathogenesis of infections of skin and soft tissue and discuss the clinical course and the laboratory diagnosis.

Specific Learning Objectives:

- Perform modified ZN staining technique from the slit skin smear provided.
- Discuss the epidemiology, classification and pathogenesis of leprosy.
- Describe in detail the laboratory diagnosis of M.leprae infections.

Pathology (PA10)

PA10.3: Define and describe the pathogenesis and pathology of leprosy.

Specific Learning Objectives:

- Analysis of the skin biopsy specimen and correlation of findings with the clinical presentation and microbiological results.
- Recognition of various histopathological characteristics of leprosy and its various forms.

Pharmacology (PH1)

PH1.46: Describe the mechanisms of action, types, doses, side effects, indications and contraindications of antileprotic drugs.

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PH1.55: Describe and discuss the following National Health Programmes including Immunisation, Tuberculosis, Leprosy, Malaria, HIV, Filaria, Kala Azar, Diarrhoeal diseases, Anaemia & nutritional disorders, Blindness, Non-communicable diseases, cancer and Iodine deficiency.

PH1.57: Describe drugs used in skin disorders.

Specific Learning Objectives:

- Familiarization with the pharmacology of drugs commonly used in leprosy treatment, such as dapsone, rifampicin, and clofazimine.
- Mechanisms of action, pharmacokinetics, and adverse effects of these drugs.
- Acquire knowledge of the standard treatment regimens recommended for leprosy by global health organizations.
- Understand the principles of combination therapy and the rationale behind using multiple drugs in leprosy treatment.
- Learn to recognize and manage potential adverse effects associated with anti-leprosy drugs.
- Understand the importance of regular monitoring for drug-related complications and patient compliance.
- Develop an awareness of the importance of pharmacovigilance in leprosy treatment.
- Learn to report and manage adverse drug reactions and interactions.
- Acquire communication skills to educate patients about the importance of medication adherence and the potential side effects of anti-leprosy drugs.
- Understand the role of patient counseling in promoting treatment compliance.
- Gain knowledge of the emergence of drug resistance in leprosy and methods for monitoring resistance patterns.
- Understand strategies for preventing and managing drug-resistant cases.

Ophthalmology (OP4, 6)

OP4.1: Enumerate, describe and discuss the types and causes of corneal ulceration.

OP4.2: Enumerate and discuss the differential diagnosis of infective keratitis.

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OP6.1: Describe clinical signs of intraocular inflammation and enumerate the features that distinguish granulomatous from non-granulomatous inflammation. Identify acute iridocyclitis from chronic condition.

OP6.6: Identify and demonstrate the clinical features and distinguish and diagnose common clinical conditions affecting the anterior chamber.

OP6.8: Enumerate and choose the appropriate investigation for patients with conditions affecting the Uvea.

OP6.9: Choose the correct local and systemic therapy for conditions of the anterior chamber and enumerate their indications, adverse events and interactions.

OP6.10: Counsel patients with conditions of the iris and anterior chamber about their diagnosis, therapy and prognosis in an empathetic manner in a simulated environment.

Specific Learning Objectives:

- Recognition of eye involvement in Leprosy.
- Recognition of visual compromise due to reactions in leprosy.
- Discuss prevention of blindness in the patient.

Orthopaedics (OR3)

OR3.1: Describe and discuss the aetiopathogenesis, clinical features, Investigations and principles of management of Bone and Joint infections

a) Acute Osteomyelitis

b) Subacute osteomyelitis

c) Acute Suppurative arthritis

d) Septic arthritis & HIV infection

e) Spirochaetal infection

f) Skeletal Tuberculosis

Specific Learning Objectives:

- Recognition of deformities as a result of untreated leprosy

- Prevention of disability
- Rehabilitation of patients with deformities
- Reconstructive surgeries especially tendon transfers

Community Medicine (CM8)

CM8.1: Describe and discuss the epidemiological and control measures including the use of essential laboratory tests at the primary care level for communicable diseases.

CM8.3: Enumerate and describe disease specific National Health Programs including their prevention and treatment of a case.

CM8.4: Describe the principles and enumerate the measures to control a disease epidemic.

CM8.5: Describe and discuss the principles of planning, implementing and evaluating control measures for disease at community level bearing in mind the public health importance of the disease.

CM8.6: Educate and train health workers in disease surveillance, control & treatment and health education.

CM8.7: Describe the principles of management of information systems.

Specific Learning Objectives:

- Explore the patient's social background, living conditions, and previous healthcare access.
- Evaluate the impact of stigma and community beliefs on Raju's delayed presentation to the healthcare center.
- Discuss the importance of early detection, contact tracing, and community awareness campaigns for leprosy control.

Pediatrics (PE31)

PE31.4: Identify Atopic dermatitis and manage.

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JAUNDICE : LINKER CASE

Team Leader: Dr. Kaushal K. Alam (Department of Physiology)

Collaborating Departments

Anatomy, Physiology, Biochemistry, Pathology, Pharmacology, Microbiology, Medicine and Pediatrics, Surgery

Patient profile and history:

Name: Mrs. Lalita

Age: 38 years

Gender: Female

Occupation: Govt. Employee

Presenting complaints:

Mrs. Lalita presents to the hospital with a three-week history of progressively worsening yellow discoloration of her skin and eyes. She also reports dark urine and pale stools. She denies any significant abdominal pain but complains of a general sense of discomfort in the right upper abdomen. She has no significant medical history. She has no history of alcohol intake, any recent travel or exposure to infectious diseases.

Present history: Over the past few months, she had noted disturbing symptoms: fatigue, loss of appetite, and nausea. She also noted that her stool was light-colored.

Physical examination:

Mrs. Lalita appears jaundiced, with yellowish sclera and skin (Figure 1).

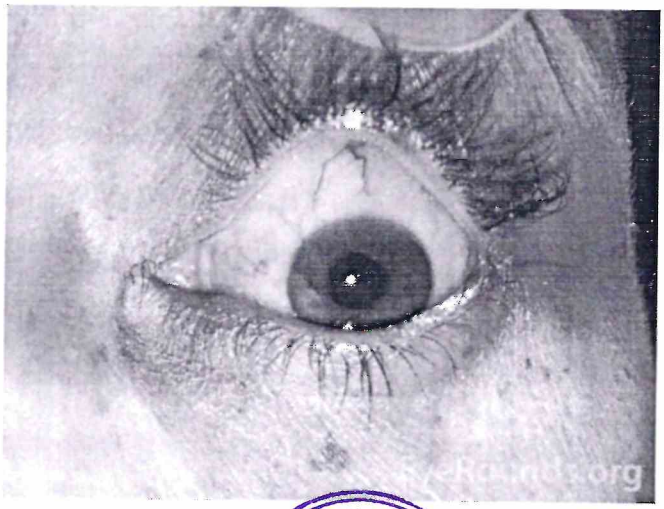

Figure 1. Image credit: Eyerounds.org, The University of Lowa.

Vital signs are stable, with no fever.

Abdominal examination: Mild tenderness in the right upper quadrant, but no rebound tenderness or guarding. Bowel sounds are present, and there are no signs of ascites.

Investigations:

Laboratory Tests:

Hemoglobin: 13g/dL (Reference range 12-16 g/dL in males)

Total Bilirubin: 5mg/dL (Reference range: 0.2-1mg/dL)

Direct Bilirubin: 1.5mg/dL (Reference range: 0.1-0.3mg/dL)

Alkaline Phosphatase (ALP): 250 U/L (Reference range: upto 100 U/L)

Alanine Aminotransferase (ALT): 35 U/L (Reference range up to 40 U/L)

Aspartate Aminotransferase (AST): 36 U/L (Reference range up to 40 U/L)

Gamma-Glutamyl Transferase (GGT): 55 U/L (Reference range up to 45 U/L)

Urine urobilinogen: Absent (normally present in small amounts)

Urine bilirubin: Present (not normally present in urine)

Faecal stercobilinogen: Absent, 'Clay' colored feces.

Imaging:

Abdominal Ultrasound: Reveals dilatation of the common bile duct (CBD) and an echogenic mass within the CBD, suggestive of an obstructing stone.

Diagnosis: Based on the clinical presentation, elevated bilirubin levels, and imaging findings, Mrs. Lalita is diagnosed with obstructive jaundice, most likely due to a common bile duct stone.

Scenario for Phase 2 & Phase 3 (I & II)

Further following can be included in above linker case:

Differential Diagnosis: Other potential causes of obstructive jaundice: pancreatic cancer, cholangiocarcinoma, and biliary strictures.

Treatment: Given the diagnosis of a common bile duct stone, the following steps are taken:

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1. **Medical Management:**
   i. The patient is kept nil per orally (NPO) to rest the gut.
   ii. Intravenous fluids and electrolytes are administered to maintain hydration.
   iii. Ursodeoxycholic acid is prescribed to facilitate bile flow and prevent further stone formation.
2. **Surgical Intervention:**
   i. The patient undergoes an endoscopic retrograde cholangiopancreatography (ERCP) to remove the obstructing stone.
   ii. If ERCP is unsuccessful or contraindicated, surgical exploration of the CBD may be necessary.
3. **Complications:**

The patient is closely monitored post-ERCP for potential complications, including pancreatitis, bleeding, or infection.

Follow-up:

Once the stone is successfully removed, Mrs. Lalita's jaundice gradually improves. With regular follow-ups, Mrs. Lalita's bilirubin levels and symptoms are closely monitored.

INTEGRATION

Anatomy: AN 47, 52, 54

AN47.5 Describe & demonstrate major viscera of abdomen under following headings (anatomical position, external and internal features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage and applied aspects)

AN47.6 Explain the anatomical basis of Splenic notch, Accessory spleens, Kehr's sign, Different types of vagotomy, Liver biopsy (site of needle puncture), Referred pain in cholecystitis, Obstructive jaundice, referred pain around umbilicus, Radiating pain of kidney to groin & Lymphatic spread in carcinoma stomach.

AN52.1 Describe & identify the microanatomical features of Gastro-intestinal system: Oesophagus, Fundus of stomach, Pylorus of stomach, Duodenum, Jejunum, Ileum, Large intestine, Appendix, Liver, Gall bladder, Pancreas & Suprarenal gland.

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AN54.2 Describe & identify the special radiographs of abdominopelvic region (contrast X ray Barium swallow, Barium meal, Barium enema, Cholecystography, Intravenous pyelography & Hysterosalpingography)

Physiology: PY 2.5

PY2.5 Describe different types of anemias & Jaundice

Specific learning objectives:

- Explain the bilirubin metabolism.
- Knowledge of enterohepatic circulation of bile helps in understanding how obstruction can lead to jaundice.
- Explain the pathophysiological mechanisms leading to elevated bilirubin levels.
- Classify Jaundice Based on Pathophysiology
- Identify Clinical Features associated with jaundice.
- Explain the diagnostic approach to evaluating jaundice.
- Outline Management and Treatment of jaundice.

Biochemistry: BI 6

BI6.13 Describe the functions of the kidney, liver, thyroid and adrenal glands.

BI6.14 Describe the tests that are commonly done in clinical practice to assess the functions of these organs (kidney, liver, thyroid and adrenal glands)

BI6.15 Describe the abnormalities of kidney, liver, thyroid and adrenal glands.

Specific Learning Objectives:

- Classify jaundice.
- Discuss the biochemical alterations seen in blood and urine in different types of jaundice.
- Explain inherited disorders associated with hyperbilirubinemia.
- Discuss the biochemical tests which are done to assess the function of liver.

Pathology: PA 25

PA25.1 Describe bilirubin metabolism, enumerate the etiology and pathogenesis of jaundice, distinguish between direct and indirect hyperbilirubinemia.

PA25.2 Describe the pathophysiology and pathologic changes seen in hepatic failure and their clincial manifestations, complications and consequences.

PA25.3 Describe the etiology and pathogenesis of viral and toxic hepatitis: distinguish the causes of hepatitis based on the clinical and laboratory features. Describe the pathology, complications and consequences of hepatitis.

PA25.4 Describe the pathophysiology, pathology and progression of alcoholic liver disease including cirrhosis.

PA25.5 Describe the etiology, pathogenesis and complications of portal hypertension.

PA25.6 Interpret liver function and viral hepatitis serology panel. Distinguish obstructive from non-obstructive jaundice based on clinical features and liver function tests

Pharmacology: PH1

PH1.34 Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs used for Irritable Bowel Disorders, biliary and pancreatic diseases

Microbiology: MI 3

MI3.6 Describe the etiopathogenesis of Acid Peptic Disease (APD) and the clinical course. Discuss the diagnosis and management of the causative agent of APD.
MI3.7 Describe the epidemiology, the etiopathogenesis and discuss the viral markers in the evolution of Viral hepatitis. Discuss the modalities in the diagnosis and prevention of viral hepatitis.

Specific Learning Objectives:

- Describe the epidemiology, clinical features, etiopathogenesis and discuss the viral markers in the evolution of Viral hepatitis.
- Discuss the modalities in the diagnosis and prevention of viral hepatitis.

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Medicine: IM5

IM5.1 Describe and discuss the physiologic and biochemical basis of hyperbilirubinemia

IM5.2 Describe and discuss the etiology and pathophysiology of liver injury

IM5.3 Describe and discuss the pathologic changes in various forms of liver disease

IM5.4 Describe and discuss the epidemiology, microbiology, immunology and clinical evolution of infective (viral) hepatitis.

IM5.5 Describe and discuss the pathophysiology and clinical evolution of alcoholic liver disease.

IM5.6 Describe and discuss the pathophysiology, clinical evolution and complications of cirrhosis and portal hypertension including ascites, spontaneous bacterial peritonitis, hepatorenal syndrome and hepatic encephalopathy.

IM5.7 Enumerate and describe the causes and pathophysiology of drug induced liver injury.

IM5.8 Describe and discuss the pathophysiology, clinical evolution and complications cholelithiasis and cholecystitis.

IM5.12 Choose and interpret appropriate diagnostic tests including: CBC, serology and bilirubin, function tests, Hepatitis ascitic fluid examination in patient with liver diseases.

IM5.13 Enumerate the indications for ultrasound and other imaging studies including MRCP and ERCP and describe the findings in liver disease

IM5.14 Outline a diagnostic approach to liver disease based on hyperbilirubinemia, liver function changes and hepatitis serology

Surgery: SU28

SU28.10 Describe the applied anatomy of liver. Describe the clinical features, Investigations and principles of management of liver abscess, hydatid disease, injuries and tumors of the liver.

SU28.11 Describe the applied anatomy of spleen. Describe the clinical features, investigations, and principles of management of splenic injuries. Describe the post-splenectomy sepsis–prophylaxis.

SU28.12 Describe the applied anatomy of biliary system. Describe the clinical features, investigations, and principles of management of diseases of biliary system

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Paediatrics: PE26

PE26.1 Discuss the etiopathogenesis, clinical features, and management of acute hepatitis in children.

PE26.2 Discuss the etiopathogenesis, clinical features, and management of fulminant Hepatic Failure in children.

PE26.3 Discuss the etiopathogenesis, clinical features, and management of chronic liver diseases in children.

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DIABETES: LINKER CASE

Team Leader: Dr. Shiba Ansari (Department of Biochemistry)

Collaborating Departments

Anatomy, Physiology, Biochemistry, Pathology, Pharmacology, Microbiology, Community Medicine, Ophthalmology, General Medicine, Obstetrics & Gynaecology, Paediatrics, Surgery, Dermatology

Patient profile and history:

Ms. Reeta, a 38-year-old lady, presented to the surgery OPD with the complaint of a non-healing wound in the left toe for the past two weeks (Figure 1).

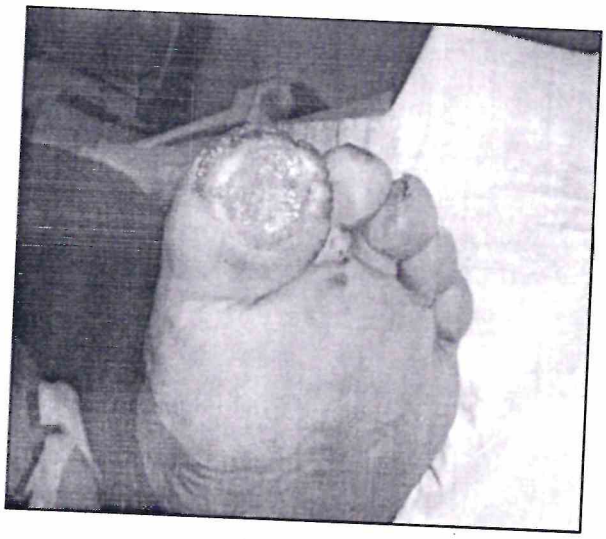

Figure 1. *Source Ref: www.doccheck.com/en/detail/photos/12139-hyperkeratosis-big-toe-ulcer*

She also gave a history of loss of weight and increased frequency of urination over the past few months. She was healthy previously and had no significant past history for chronic diseases. There is no family history of diabetes, hypertension and tuberculosis. She is non-alcoholic and non-smoker.

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Physical examination:

On examination, the patient was oriented, and obese. Her weight was 70 kg and height 148 cm. Her heart rate was 70 bpm, all peripheral pulses were well felt, BP was 120/80 mm Hg., respiratory rate 16 per min. No pallor, icterus, oedema and lymphadenopathy were noted. The wound was 2X1 cm, partially healed, painless and covered with slough.

Respiratory and CVS examinations were unremarkable. Glove and stocking neuropathy was observed on neurological examination.

Random blood sugar was measured by a glucometer and found to be 360 mg/dL. The patient was initially managed by wound debridement and dressing along with oral antibiotics. Investigations were ordered for further evaluation and diagnosis. Patient was referred to the Medicine/Endocrinology department.

Laboratory Investigations:

Fasting plasma glucose (FPG)	180 mg/dL
Postprandial plasma glucose (PPG)	350 mg/dL
Glycated hemoglobin (HbA1c)	10.5 %
Serum Urea	80 mg/dL
Serum Creatinine	1.8 mg/dL
Serum Uric acid	5 mg/dL
Serum total bilirubin	0.8 mg/dL
Serum ALT	35 U/L
Serum total protein	6 mg/dL
Serum total cholesterol	300 mg/dL
Serum triglycerides	350 mg/dL
Serum HDL cholesterol	38 mg/dL

Urinalysis showed a specific gravity of 1.035, glucose 4+, proteins 2+, and pH of 6.0.

CBC was within normal limits.

Slower and weaker signals were observed on nerve conduction velocity testing.

Management Plan:

Diagnosis of Type 2 Diabetes Mellitus with diabetic neuropathy and nephropathy was made. Patient was put on insulin sliding scale and regular self-monitoring of glucose. Patient was advised diabetic diet including foods with low glycemic index and physical exercise. Patient was advised to strictly adhere to the treatment and follow-up.

Patient was also referred to the ophthalmology department for fundus examination.

INTEGRATION

Anatomy (AN47.5)

AN47.5: Describe & demonstrate major viscera of abdomen under following headings (anatomical position, external and internal features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage and applied aspects)

Specific Learning Objectives:

- Describe the structure and anatomy of pancreas.
- Discuss the developmental abnormalities in context of pancreas.

Physiology (PY4 & 8)

PY4.8: Describe & discuss gastric function tests, pancreatic exocrine function tests & liver function tests.

PY8.2: Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas and hypothalamus

PY8.4: Describe function tests: Thyroid gland, Adrenal cortex, Adrenal medulla and pancreas.

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PY8.6: Describe & differentiate the mechanism of action of steroid, protein and amine hormones

Specific Learning Objectives:

- Describe the physiological anatomy of the Endocrine Pancreas.
- Describe and discuss pancreatic exocrine function tests.
- Discuss the synthesis, secretions, transport, and mechanism of action of insulin and glucagon.
- Discuss the function of insulin and glucagon and the role of various hormones in glucose homeostasis.
- Discuss the significance of Nerve conduction studies in interpreting diabetic neuropathy.

Biochemistry (BI3, 7, 8 & 11)

BI3.5: Describe and discuss the regulation, functions and integration of carbohydrate along with associated diseases/disorders.

BI3.8: Discuss and interpret laboratory results of analytes associated with metabolism of carbohydrates.

BI3.9: Discuss the mechanism and significance of blood glucose regulation in K health and disease.

BI3.10: Interpret the results of blood glucose levels and other laboratory investigations related to disorders of carbohydrate metabolism.

BI7.7: Describe the role of oxidative stress in the pathogenesis of conditions such as cancer, complications of diabetes mellitus and atherosclerosis

BI8.3: Provide dietary advice for optimal health in childhood and adult, in disease conditions like diabetes mellitus, coronary artery disease and in pregnancy.

BI11.17: Explain the basis and rationale of biochemical tests done in the following conditions: diabetes mellitus, dyslipidemia, myocardial infarction, renal failure, gout, proteinuria, nephrotic syndrome, edema, jaundice, liver diseases, pancreatitis, disorders of acid- base balance, thyroid disorders.

Specific Learning Objectives:

- Calculation of BMI and its significance.
- Explain the structure of Insulin, C-peptide.
- Discuss the action of insulin through insulin receptors and the signalling pathways involved.
- Explain glucose homeostasis via interplay of various hormones.
- Describe the pathophysiology of Type 2 diabetes
- Interpretation of Lipid profile in diabetes
- Interpretation of FPG, PPG, HbA1c, OGTT, urinalysis
- Use of POCT such as glucometer.
- Discuss Glycemic index and Diabetic Diet.

Pathology (PA32.4)

PA32.4: Classify and describe the epidemiology, etiology, pathogenesis, pathology, clinical laboratory features, complications and progression of diabetes mellitus.

Pharmacology (PH1.36)

PH1.36: Describe the mechanism of action, types, doses, side effects, indications and contraindications of drugs used in endocrine disorders (diabetes mellitus, thyroid disorders and osteoporosis)

Specific Learning Objectives:

- Oral Hypoglycemic drugs: Classification, Mechanism of action, Pharmacokinetics, indications, drug interactions and adverse effects.
- Insulin: Mechanism of action, Types of insulin preparations, dosage, routes of administration, drug interactions and adverse effects.

Microbiology (MI2, 4 & 7)

MI2.3: Identify the microbial agents causing Rheumatic heart disease & infective Endocarditis

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MI4.3: Describe the etio-pathogenesis of infections of skin and soft tissue and discuss the clinical course and the laboratory diagnosis.

MI7.3: Describe the etio-pathogenesis, clinical features, the appropriate method for specimen collection, and discuss the laboratory diagnosis of Urinary tract infections.

Specific Learning Objectives:

- Spectrum of bacterial infections in diabetes (Head & neck infections, respiratory infections, CVS infection mainly infective endocarditis, GIT infections mainly emphysematous cholecystitis, liver abscess, UTI, Skin & soft tissue infections mainly diabetic foot)
- Antibiotic therapy for the management of bacterial infections in diabetics

Community medicine (CM8)

CM8.2: Describe and discuss the epidemiological and control measures including the use of essential laboratory tests at the primary care level for Non-Communicable diseases (diabetes, Hypertension, Stroke, obesity and cancer etc.)

CM8.3: Enumerate and describe disease specific National Health Programs including their prevention and treatment of a case.

CM8.4: Describe the principles and enumerate the measures to control a disease epidemic.

CM8.5: Describe and discuss the principles of planning, implementing and evaluating control measures for disease at community level bearing in mind the public health importance of the disease.

CM8.6: Educate and train health workers in disease surveillance, control & treatment and health education.

Specific Learning Objectives:

- How we can ensure early detection of diabetes in individuals like Ms. Reeta who may not have a significant past medical history or family history of the disease?
- Discuss the Community Based Assessment Checklist and utility of this kind of screening procedure.

- What community-based interventions can be implemented to promote healthy lifestyles and prevent occurrence of diabetes in the population?
- Discuss the significance of "diabetes" education programs at the community level and propose strategies for effective diabetes self-management support within communities.
- How levels of prevention could be applied regarding development of diabetes and to halt the progression of associated complications.

Ophthalmology (OP7, 8)

OP7.2: Describe and discuss the aetio-pathogenesis, stages of maturation and complications of cataract.

OP8.2: Enumerate the indications for laser therapy in the treatment of retinal diseases (including retinal detachment, retinal degenerations, diabetic retinopathy & hypertensive retinopathy).

OP8.3: Demonstrate the correct technique of a fundus examination and describe and distinguish the funduscopic features in a normal condition and in conditions causing an abnormal retinal exam.

OP8.4: Enumerate and discuss treatment modalities in management of diseases of the retina

Pediatrics (PE33)

PE33.4: Discuss the etio-pathogenesis, clinical types, presentations, complication and management of Diabetes mellitus in children.

PE33.5: Interpret Blood sugar reports and explain the diagnostic criteria for Type 1 Diabetes.

PE33.6: Perform and interpret Urine Dip Stick for Sugar.

Obstetrics and Gynaecology (OG12.3)

OG12.3: Define, classify and describe the etiology, pathophysiology, diagnosis, investigations, criteria, adverse effects on the mother and foetus and the management during pregnancy and labor, and complications of diabetes in pregnancy.

Specific Learning Objectives:

- Discuss classification & etiopathogenesis of Diabetes in pregnancy.
- List screening methods for gestational diabetes mellitus.
- Discuss clinical features and diagnosis of diabetes in pregnancy.
- Enumerate maternal and fetal complications of diabetes in pregnancy.
- Discuss investigations to be done in pregnant woman with diabetes in pregnancy.
- Describe the management during pregnancy and labor of a case of pregnancy with diabetes.

General Medicine (IM11)

IM11.1: Define and classify diabetes.

IM11.2: Describe and discuss the epidemiology and pathogenesis and risk factors and clinical evolution of type 1 diabetes.

IM11.3: Describe and discuss the epidemiology and pathogenesis and risk factors economic impact and clinical evolution of type 2 diabetes.

IM11.4: Describe and discuss the genetic background and the influence of the environment on diabetes.

IM11.5: Describe and discuss the pathogenesis and temporal evolution of microvascular and macrovascular complications of diabetes.

IM11.6: Describe and discuss the pathogenesis and precipitating factors, recognition and management of diabetic emergencies.

IM11.7: Elicit document and present a medical history that will differentiate the aetiologies of diabetes including risk factors, precipitating factors, lifestyle, nutritional history, family history, medication history, co-morbidities and target organ disease.

IM11.8: Perform a systematic examination that establishes the diagnosis and severity that includes skin, peripheral pulses, blood pressure measurement, fundus examination, detailed examination of the foot (pulses, nervous and deformities and injuries).

IM11.9: Describe and recognise the clinical features of patients who present with a diabetic emergency.

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IM11.11: Order and interpret laboratory tests to diagnose diabetes and its complications including: glucoses, glucose tolerance test, glycosylated hemoglobin, urinary micro albumin, ECG, electrolytes, ABG, ketones, renal function tests and lipid profile.

IM11.12: Perform and interpret a capillary blood glucose test.

IM11.13: Perform and interpret a urinary ketone estimation with a dipstick

IM11.15: Recognise the presentation of diabetic emergencies and outline the principles of therapy.

IM11.16: Discuss and describe the pharmacologic therapies for diabetes their indications, contraindications, adverse reactions and interactions.

IM11.17: Outline a therapeutic approach to therapy of T2Diabetes based on presentation, severity and complications in a cost-effective manner.

IM11.18: Describe and discuss the pharmacology, indications, adverse reactions and interactions of drugs used in the prevention and treatment of target organ damage and complications of Type II Diabetes including neuropathy, nephropathy, retinopathy, hypertension, dyslipidemia and cardiovascular disease.

IM11.19: Demonstrate and counsel patients on the correct technique to administer insulin.

IM11.20: Demonstrate to and counsel patients on the correct technique of self-monitoring of blood glucose.

Surgery (SU5.3)

SU5.3: Differentiate the various types of wounds, plan and observe management of wounds.

Specific Learning Objective:

- Plan and observe management of wounds in diabetics such as diabetic foot.

Dermatology (DR18.1)

DR18.1: Enumerate the cutaneous features of Type 2 diabetes.

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THYROID: LINKER CASE

Team Leader: Dr Proteesh Rana (Department of Pharmacology)

Collaborating Departments

Anatomy, Physiology, Biochemistry, Pathology, Pharmacology, Pediatrics, General Medicine, Obstetrics and Gynecology, Community Medicine, General Surgery, Dermatology, Psychiatry

Patient profile and history

Kavya, a 30-year-old female presents to her primary care physician with complaints of progressive weight gain, fatigue and cold intolerance, for the past 3-months. She also reports having dry skin, constipation and irregular menstrual periods. On further enquiry, she also gives history of low mood, poor concentration and lack of interest in daily activities for which she has recently consulted a psychologist.

Examination

On physical examination her pulse rate is 54/minute, blood pressure is 140/90 mm Hg; and temperature is 96.8°F. She is moderately obese and has a puffy face with cold, dry and thick skin. A diffuse swelling is noted in front of the neck, which is firm, smooth, non-tender and moves on swallowing (Figure 1). The neurological examination revealed slow speech and delayed relaxation of bilateral ankle reflexes.

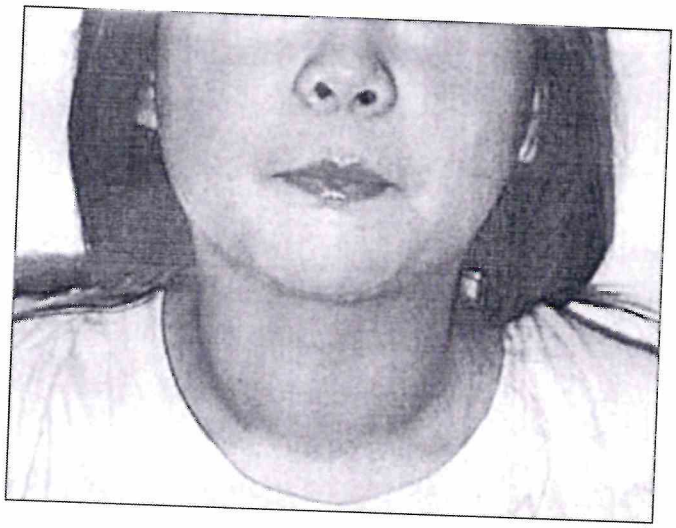

Figure 1. Source Ref:
https://www.ask4healthcare.com/content/DisDescription?strdisease=GOITRE

Investigations

On laboratory investigation, her complete blood count (CBC) was within the normal limit but her thyroid function tests were deranged, serum thyroid stimulating hormone (TSH) level was 15.0 mIU/L (Reference range: 0.4 to 4 mIU/L) and serum-free T4 level was 3.8 µg/dL (Reference range: 5 to 12 µg/dL). She was also found positive for anti-thyroid peroxidase (anti-TPO) antibody.

Diagnosis

Based on the findings of clinical examination and laboratory investigations, she is diagnosed with primary hypothyroidism, likely to be auto-immune (or Hashimoto's) thyroiditis.

Management

She is prescribed Tablet L-Thyroxine 50 µg, to be taken once daily, empty stomach, and is advised to follow up after 4-weeks for further management.

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INTEGRATION

Anatomy:

AN35.2 Describe & demonstrate location, parts, borders, surfaces, relations & blood supply of thyroid gland

AN35.8 Describe the anatomically relevant clinical features of Thyroid swellings

AN43.2 Identify, describe and draw the microanatomy of pituitary gland, thyroid, parathyroid gland, tongue, salivary glands, tonsil, epiglottis, cornea, retina

AN43.4 Describe the development and developmental basis of congenital anomalies of face, palate, tongue, branchial apparatus, pituitary gland, thyroid gland & eye

AN43.6 Demonstrate surface projection of- Thyroid gland, Parotid gland and duct, Pterion, Common carotid artery, Internal jugular vein, Subclavian vein, External jugular vein, Facial artery in the face & accessory nerve

Physiology:

PY8.2 Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas and hypothalamus

PY8.4 Describe function tests: Thyroid gland; Adrenal cortex, Adrenal medulla and pancreas

Specific Learning Objectives:

- Describe the biochemical processes involved in the synthesis of hormones.
- Explain the mechanisms by which these hormones are secreted into the bloodstream.
- Understand the transport mechanisms of these hormones, including how they travel in the blood and how they reach their target organs.
- Describe the physiological actions of these hormones on their target tissues and organs.
- Explain the feedback mechanisms and regulatory pathways that control hormone levels.
- Analyze the physiological and pathological consequences of hypo- and hyper-secretion of these hormones.
- Understand and interpret the Thyroid function tests.

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Biochemistry:

BI11.17 Explain the basis and rationale of biochemical tests done in the following conditions: - diabetes mellitus, - dyslipidemia, - myocardial infarction, - renal failure, gout, - proteinuria, - nephrotic syndrome, - edema, - jaundice, - liver diseases, pancreatitis, disorders of acid- base balance, - thyroid disorders

BI6.13 Describe the functions of the kidney, liver, thyroid and adrenal glands

BI6.14 Describe the tests that are commonly done in clinical practice to assess the functions of these organs (kidney, liver, thyroid and adrenal glands

BI6.15 Describe the abnormalities of kidney, liver, thyroid and adrenal glands

Specific Learning Objectives:

- Outline functions of thyroid gland
- Enumerate and explain the interpretation of Thyroid Function tests.
- Discuss the biochemical alterations in the Thyroid-Hypothyroidism and hyperthyroidism

Pathology:

PA23.3 Describe and interpret the abnormalities in a panel containing semen analysis, thyroid function tests, renal function tests or liver function tests

PA32.1 Enumerate, classify and describe the etiology, pathogenesis, pathology and iodine dependency of thyroid swellings

PA32.3 Describe the etiology, pathogenesis, manifestations, laboratory and imaging features and course of thyrotoxicosis/ hypothyroidism

Pharmacology:

PH1.36 Describe the mechanism of action, types, doses, side effects, indications and contraindications of drugs used in endocrine disorders (diabetes mellitus, thyroid disorders and osteoporosis)

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Medicine/ Endocrinology:

M12.1 Describe the epidemiology and pathogenesis of hypothyroidism and hyperthyroidism including the influence of iodine deficiency and autoimmunity in the pathogenesis of thyroid disease

M12.3 Describe and discuss the physiology of the hypothalamopituitary - thyroid axis, principles of thyroid function testing, and alterations in physiologic function

Paediatrics

PE33.1 Describe the etiopathogenesis clinical features, management of Hypothyroidism in children

PE33.2 Recognize the clinical signs of Hypothyroidism and refer

PE33.3 Interpret and explain neonatal thyroid screening report

Obstetrics and Gynecology

OG8.1 Enumerate, describe and discuss the objectives of antenatal care, assessment of period of gestation; screening for high-risk factors.

OG25.1 Describe and discuss the causes of primary and secondary amenorrhea, its investigation and the principles of management.

OG28.1 Describe and discuss the common causes, pathogenesis, clinical features, differential diagnosis; investigations; principles of management of infertility – methods of tubal patency, ovulation induction, assisted reproductive techniques

Community Medicine

CM5.3 Define and describe common nutrition related health disorders (including macro-PEM, Micro-iron, Zn, iodine, Vit. A), their control and management

CM5.6 Enumerate and discuss the National Nutrition Policy, important national nutritional Programs including the Integrated Child Development Services Scheme (ICDS) etc

CM5.8 Describe and discuss the importance and methods of food fortification and effects of additives and adulteration

CM 8.3 Enumerate and describe disease specific National Health Programs including their prevention and treatment of a case.

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General surgery

SU22.1 Describe the applied anatomy and physiology of thyroid

SU22.2 Describe the etiopathogenesis of thyroidal swellings

SU22.3 Demonstrate and document the correct clinical examination of thyroid swellings and discus the differential diagnosis and their management

SU22.4 Describe the clinical features, classification and principles of management of thyroid cancer

Dermatology:

DR18.2 Enumerate the cutaneous features of hypo/ hyperthyroidism

Psychiatry

PS19.5 Describe the concept and principles of preventive psychiatry and mental health promotion (positive mental health); and community education.

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CONGENITAL HYPOTHYROIDISM: LINKER CASE

Team Leader: Dr. Vikram Bhaskar (Department of Pediatrics)

Collaborating Departments

Anatomy, Physiology, Biochemistry, Pathology, Pharmacology, Pediatrics, Medicine, Obstetrics and Gynaecology, Community Medicine

Patient profile and history:

Gargi, a 1.5-month-old infant was brought to pediatric OPD for routine immunization. The mother complained that her baby appears to be more dull than her previous baby who is now 4 years old. The child has a history of jaundice noticed on day 16 of birth and required phototherapy for one day. Otherwise, the child is apparently healthy, on exclusive breastfeeding, and gaining weight appropriately.

Mother gives a history of hypothyroidism in the past, but she is not on any treatment at present.

Examination

On physical examination, the baby appeared to be dull, with coarse facial features. The anterior fontanelle was wide, and the posterior fontanelle was also open. An umbilical hernia was present. Skin was rough and dry. There was no pallor, icterus, cyanosis or clubbing.

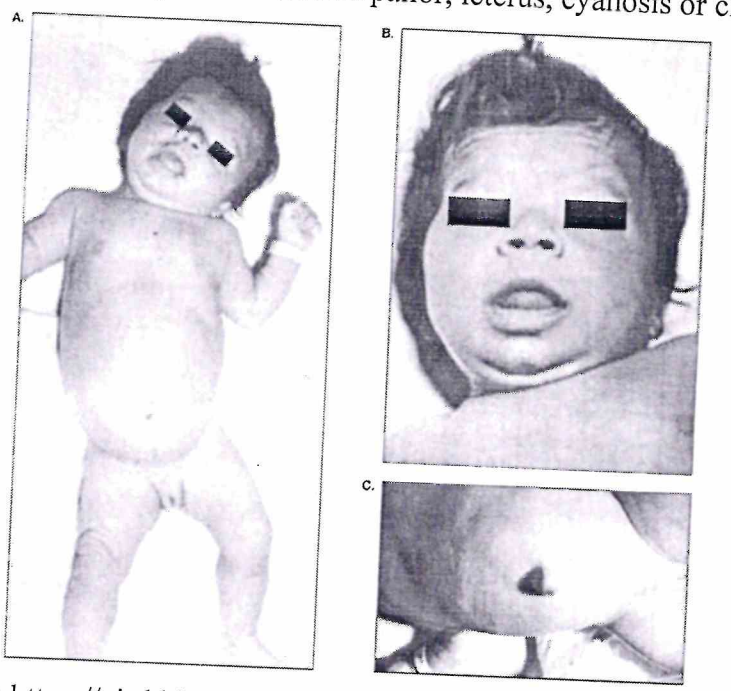

Image credit: https://ojrd.biomedcentral.com/articles/10.1186/1750-1172-5-17

Investigations

The laboratory investigation revealed a TSH of 124 IU/mL, with an FT4 of 0.3 ng/dL. The USG neck revealed an absent thyroid gland. However, a thyroid scan revealed no uptake.

Diagnosis

Based on the findings of clinical examination and laboratory investigations, the child was diagnosed as a case of congenital hypothyroidism (cause: thyroid dysgenesis)

Management

The patient was prescribed oral thyroxine at 15 micrograms/kg/day.

INTEGRATION

Anatomy:

AN35.2 Describe & demonstrate location, parts, borders, surfaces, relations & blood supply of thyroid gland

AN35.8 Describe the anatomically relevant clinical features of Thyroid swellings

AN43.2 Identify, describe and draw the microanatomy of pituitary gland, thyroid, parathyroid gland, tongue, salivary glands, tonsil, epiglottis, cornea, retina

AN43.4 Describe the development and developmental basis of congenital anomalies of face, palate, tongue, branchial apparatus, pituitary gland, thyroid gland & eye

AN43.6 Demonstrate surface projection of- Thyroid gland, Parotid gland and duct, Pterion, Common carotid artery, Internal jugular vein, Subclavian vein, External jugular vein, Facial artery in the face & accessory nerve

Physiology:

PY8.2 Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas and hypothalamus

PY8.4 Describe function tests: Thyroid gland; Adrenal cortex, Adrenal medulla and pancreas.

Specific Learning Objectives:

- Describe the physiological actions of thyroid hormone.
- Explain the feedback mechanisms and regulatory pathways that control hormone levels.
- Analyze the physiological and pathological consequences of hypo- and hyper-secretion of thyroid hormone.
- Understand and interpret the Thyroid function tests.

Biochemistry:

BI11.17 Explain the basis and rationale of biochemical tests done in the following conditions: - diabetes mellitus, - dyslipidemia, - myocardial infarction, - renal failure, gout, - proteinuria, - nephrotic syndrome, - edema, - jaundice, - liver diseases, pancreatitis, disorders of acid- base balance, - thyroid disorders

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BI6.15 Describe the abnormalities of kidney, liver, thyroid and adrenal glands.

Specific Learning Objectives:

- Outline functions of thyroid gland
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PA23.3 Describe and interpret the abnormalities in a panel containing semen analysis, thyroid function tests, renal function tests or liver function tests

PA32.1 Enumerate, classify and describe the etiology, pathogenesis, pathology and iodine dependency of thyroid swellings

PA32.3 Describe the etiology, pathogenesis, manifestations, laboratory and imaging features and course of thyrotoxicosis/ hypothyroidism

Pharmacology:

PH1.36 Describe the mechanism of action, types, doses, side effects, indications and contraindications of drugs used in endocrine disorders (diabetes mellitus, thyroid disorders and osteoporosis)

Medicine/ Endocrinology:

M12.1 Describe the epidemiology and pathogenesis of hypothyroidism and hyperthyroidism including the influence of iodine deficiency and autoimmunity in the pathogenesis of thyroid disease

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M12.3 Describe and discuss the physiology of the hypothalamopituitary - thyroid axis, principles of thyroid function testing and alterations in physiologic function

Pediatrics

PE1.5 Define development and discuss the normal developmental milestones with respect to motor, behaviour, social, adaptive and language

PE33.1 Describe the etiopathogenesis clinical features, management of Hypothyroidism in children

PE33.2 Recognize the clinical signs of Hypothyroidism and refer

PE33.3 Interpret and explain neonatal thyroid screening report

Obstetrics and Gynecology

OG8.1 Enumerate, describe and discuss the objectives of antenatal care, assessment of period of gestation; screening for high-risk factors.

OG25.1 Describe and discuss the causes of primary and secondary amenorrhea, its investigation and the principles of management.

OG28.1 Describe and discuss the common causes, pathogenesis, clinical features, differential diagnosis; investigations; principles of management of infertility – methods of tubal patency, ovulation induction, assisted reproductive techniques

Community Medicine

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CM5.8 Describe and discuss the importance and methods of food fortification and effects of additives and adulteration

CM 8.3 Enumerate and describe disease specific National Health Programs including their prevention and treatment of a case

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ROAD TRAFFIC ACCIDENT: LINKER CASE

Team Leader: Dr. Arvind Kumar (Department of Forensic Medicine)

Collaborating Departments

Anatomy, Forensic Medicine, Orthopaedics, Surgery and Neuro-Surgery

Introduction

A PCR call was received at GTB Enclave Police Station stating that an accident had occurred on the road at the red light in front of IHBAS and the injured person was being taken to the emergency department of the GTB hospital.

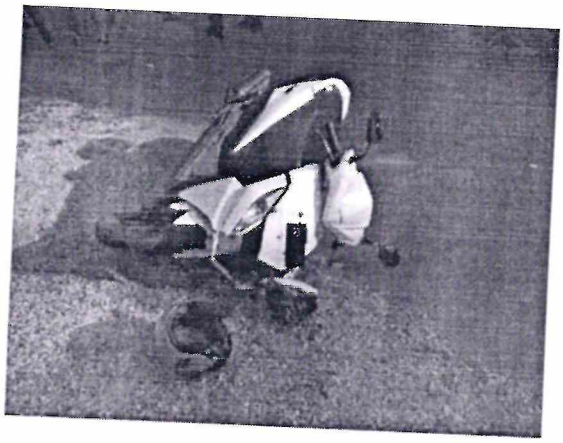
Patient Profile:

Name: Rahul Sharma S/O Ram Sharma Age - 27 yrs. Sex- Male

Address- 37, GTB Enclave, Delhi

Crime Scene:

After the PCR call was received, police reached the crime scene, where a white scooty in an accidental state with a helmet was parked. No injured person was found at the crime scene. Blood stains were present near the broken scooty. Photographs were taken and both scooty with helmet were seized.



ER Scenario

The injured person was taken to the Emergency Room, at GTB Hospital, where MLC was made. The patient was drowsy, with a history of loss of consciousness, vomiting, and ENT bleed with severe pain in the abdomen. The vitals were, BP- 100/80 mmHg, PR- 100/min, Spo2- 92% on room air, GCS- E2V3M2

Local Examination:

The following injuries were noted:

1. A lacerated wound, 2cm x 0.5cm x bone deep, was present over the left side of the forehead.

2. Reddish abrasion, 1cm x 0.6cm, present over nose.
3. Swelling and bruises were present around the left eye. (Black eye)
4. Grazed reddish abrasion, 5cm x 3cm, with deformity present over left elbow.
5. Deformity of left thigh, about 13cm above knee joint was present.

The patient was given primary treatment in the form of fluids, Oxygen by mask, analgesics, inj. Tetanus and admitted to the neurosurgery ward. Calls to the Surgery, ENT, and Orthopedic departments were made.

Laboratory Tests:

To confirm the diagnosis necessary investigations were done.

NCCT Head was done, which showed Subdural hemorrhage over the left front-parietal-temporal region with frontal contusions with a fracture of the left frontal bone at the base with a nasal bone fracture.

USG abdomen: free fluids were present in the peritoneal cavity.

X-ray AP and lateral hip revealed a fracture of the shaft of the left femur, with a fracture of the left superior pubic rami.

INTEGRATION

Anatomy: AN17, 20, 27, 47, 51, 52, 53

AN17.2 Describe the anatomical basis of complications of fracture neck of femur.

IM18.1 Describe the functional and the vascular anatomy of the brain.

AN20.7 Identify & demonstrate important bony landmarks of lower limb: -Vertebral levels of highest point of iliac crest, posterior superior iliac spines, iliac tubercle, pubic tubercle, ischial tuberosity, adductor tubercle, -Tibial tuberosity, head of fibula, -Medial and lateral malleoli, Condyles of femur and tibia, sustentaculum tali, tuberosity of fifth metatarsal, tuberosity of the navicular.

AN27.1 Describe the layers of scalp, its blood supply, its nerve supply and surgical importance.

AN47.5 Describe & demonstrate major viscera of abdomen under following headings (anatomical position, external and internal features, important peritoneal and other relations).

AN51.2 Describe & identify the midsagittal section of male and female pelvis.

AN52.1 Describe & identify the microanatomical features of Gastro-intestinal system: Oesophagus, Fundus of stomach, Pylorus of stomach, Duodenum, Jejunum, Ileum, Large intestine, Appendix, Liver, Gall bladder, Pancreas & Suprarenal gland

AN53.2 Demonstrate the anatomical position of bony pelvis & show boundaries of pelvic inlet, pelvic cavity, pelvic outlet

AN53.4 Explain and demonstrate clinical importance of bones of abdominopelvic region (sacralization of lumbar vertebra, Lumbarization of 1st sacral vertebra, types of bony pelvis & Coccyx)

Forensic Medicine: FM1, 2, 3, 14

FM1.9 Describe the importance of documentation in medical practice in regard to medicolegal examinations, Medical Certificates and medicolegal reports.

FM2.11 Describe and discuss autopsy procedures including postmortem examination, different types of autopsies, aims and objectives of post-mortem examination.

FM2.12 Describe the legal requirements to conduct post-mortem examination and procedures to conduct medico-legal postmortem examination.

FM3.4 Mechanical injuries and wounds: Define injury, assault & hurt. Describe IPC pertaining to injuries

FM3.6 Mechanical injuries and wounds: Describe healing of injury and fracture of bones with its medico-legal importance.

FM3.11 Regional Injuries: Describe and discuss regional injuries to head (Scalp wounds, fracture skull, intracranial haemorrhages, coup and contrecoup injuries), neck, chest, abdomen, limbs, genital organs, spinal cord and skeleton.

FM3.32 Demonstrate the professionalism while preparing reports in medicolegal situations, interpretation of findings and making inference/opinion, collection preservation and dispatch of biological or trace evidences.

FM14.10 Demonstrate ability to identify & prepare medicolegal inference from specimens obtained from various types of injuries e.g. contusion, abrasion, laceration, firearm wounds, burns, head injury and fracture of bone.

FM14.11 To identify & describe weapons of medicolegal importance which are commonly used e.g. lathi, knife, kripan, axe, gandasa, gupti, farsha, dagger, bhalla, razor & stick. Able to prepare reports of the weapons brought by police and to give opinion regarding injuries present on the person as described in injury report/ PM report so as to connect weapon with the injuries. (Prepare injury report/ PM report must be provided to connect the weapon with the injuries)

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Orthopedics: OR2, 13

OR2.10 Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of fractures of proximal femur

OR2.11 Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of (a) Fracture patella (b) Fracture distal femur © Fracture proximal tibia with special focus on neurovascular injury and compartment syndrome.

OR2.12 Describe and discuss the aetiopathogenesis, clinical features, Investigation and principles of management of Fracture shaft of femur in all age groups and the recognition and management of fat embolism as a complication.

OR13.1 Participate in a team for procedures in patients and demonstrating the ability to perform on mannequins / simulated patients in the following:

i. Above elbow plaster

ii. Below knee plaster

iii. Above knee plaster

iv. Thomas splint

v. splinting for long bone fractures

vi. Strapping for shoulder and clavicle trauma.

PM6.3 Describe the principles of skin traction, serial casts and surgical treatment including contracture release, tendon transfer, osteotomies and arthrodesis.

Surgery: SU1, 28

SU1.1 Describe basic concepts of homeostasis, enumerate the metabolic changes in injury and their mediators.

SU28.13 Describe the applied anatomy of small and large intestines.

Neuro-Surgery: SU17, IM6, PM8

PM8.1 Describe the clinical features, evaluation, diagnosis, and management of disability following traumatic brain injury.

IM6.12 Enumerate the indications and describe the findings for CT of the chest and brain and MRI.

SU17.4 Describe the Pathophysiology and mechanism of head injuries.

SU17.5 Describe clinical features for neurological assessment and GCS in head injuries.

SU17.6 Choose appropriate investigations and discuss the principles of management of head injuries.

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HIV : LINKER CASE

Team Leader: Dr. Nadeem Ahmad (Department of Microbiology)

Collaborating Departments

Microbiology, Pathology, Pharmacology, General Medicine, Obstetrics & Gynecology, Paediatrics, Community Medicine, Dermatology, Otorhinolaryngology, Respiratory Medicine, Orthopaedics

Patient profile and history:

Suresh, a 25 years old truck driver is admitted with complaints of unexplained fever, progressive loss of weight, persistent diarrhea and generalized lymphadenopathy for the past 6 months. He has history of multiple unprotected sexual encounters.

Clinical Examination:

General examination reveals severe pallor and generalized lymphadenopathy. Cyanosis was absent. Hepatosplenomegaly was present.

Laboratory Investigation:

Initial lab investigation showed Hb- 5.1 gm% & TLC- 450/μL.

Management:

Patient is diagnosed with human immunodeficiency virus (HIV) infection and prescribed a combination antiretroviral therapy of dolutegravir, lamivudine, and tenofovir disoproxil.

INTEGRATION

Microbiology (MI2.7)

MI2.7: Describe the epidemiology, the etiopathogenesis, evolution, complications, opportunistic infections, diagnosis, prevention and the principles of management of HIV.

Specific learning Objectives:

- Discuss the morphology, evolution and modes of transmission of Human Immunodeficiency Virus.
- Discuss the etiopathogenesis, clinical features of HIV infection. Enlist the opportunistic infections in HIV.
- Describe the laboratory diagnosis and the principles of management of HIV infection.
- Discuss the prevention and current vaccines under research for prophylaxis of AIDS.

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Pharmacology (PH1.48)

PH1.48: Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in UTI/ STD and viral diseases including HIV.

Specific Learning Objectives:

- Classification of Antiretroviral drugs.
- Mechanism of action, Pharmacokinetics and Adverse drug reaction of these drugs.
- HIV Treatment principle and guidelines.
- HAART regimens and post exposure prophylaxis of HIV infection

Pathology (PA9, 10)

PA9.6: Define and describe the pathogenesis and pathology of HIV and AIDS

PA10.4: Define and describe the pathogenesis and pathology of common bacterial, viral, protozoal and helminthic diseases.

Specific Learning Objectives:

- Describe in detail the pathogenesis of HIV disease
- Discuss the opportunistic infections

General Medicine (IM3, 6)

IM3.7: Order and interpret diagnostic tests based on the clinical presentation including: CBC, Chest X ray PA view, Mantoux, sputum gram stain, sputum culture and sensitivity, pleural fluid examination and culture, HIV testing and ABG.

IM6.1: Describe and discuss the symptoms and signs of acute HIV seroconversion.

IM6.2: Define and classify HIV AIDS based on the CDC criteria.

IM6.3: Describe and discuss the relationship between CDC count and the risk of opportunistic infections.

IM6.4: Describe and discuss the pathogenesis, evolution and clinical features of common HIV related opportunistic infections.

IM6.5: Describe and discuss the pathogenesis, evolution and clinical features of common HIV related malignancies.

IM6.6: Describe and discuss the pathogenesis, evolution and clinical features of common HIV related skin and oral lesions.

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IM6.7: Elicit document and present a medical history that helps delineate the aetiology of the current presentation and includes risk factors for HIV, mode of infection, other sexually transmitted diseases, risks for opportunistic infections and nutritional status.

IM6.8: Generate a differential diagnosis and prioritise based on clinical features that suggest a specific etiology for the presenting symptom.

IM6.9: Choose and interpret appropriate diagnostic tests to diagnose and classify the severity of HIV-AIDS including specific tests of HIV, CDC

IM6.10: Choose and interpret appropriate diagnostic tests to diagnose opportunistic infections including CBC, sputum examination and cultures, blood cultures, stool analysis, CSF analysis and Chest radiographs

IM6.16: Discuss and describe the principles of HAART, the classes of antiretrovirals used, adverse reactions and interactions.

IM6.17: Discuss and describe the principles and regimens used in post exposure prophylaxis.

IM6.18: Enumerate the indications and discuss prophylactic drugs used to prevent HIV related opportunistic infections.

IM6.19: Counsel patients on prevention of HIV transmission

IM6.20: Communicate diagnosis, treatment plan and subsequent follow up plan to patients.

IM6.21: Communicate with patients on the importance of medication adherence

IM6.22: Demonstrate understanding of ethical and legal issues regarding patient confidentiality and disclosure in patients with HIV.

IM6.23: Demonstrate a non-judgemental attitude to patients with HIV and to their lifestyles.

Specific Learning Objectives:

- Discuss the clinical spectrum of AIDS.
- Describe the clinical diagnosis of AIDS.
- Discuss the management of an HIV positive adult.

Pediatrics (PE19, 34)

PE19.5: Discuss immunization in special situations – HIV positive children, immunodeficiency, pre-term, organ transplants, those who received blood and blood products, splenectomised children, adolescents, travellers.

Specific Learning Objectives:

- Discuss immunization in special situations – HIV positive children, immunodeficiency.
- Management of an HIV positive child.

Community Medicine (CM8)

CM8.1: Describe and discuss the epidemiological and control measures including the use of essential laboratory tests at the primary care level for communicable diseases.

CM8.3: Enumerate and describe disease specific National Health Programs including their prevention and treatment of a case.

CM8.4: Describe the principles and enumerate the measures to control a disease epidemic.

CM8.5: Describe and discuss the principles of planning, implementing and evaluating control measures for disease at community level bearing in mind the public health importance of the disease.

CM8.6: Educate and train health workers in disease surveillance, control & treatment and health education.

CM8.7: Describe the principles of management of information systems.

Specific Learning Objectives:

- Discuss the epidemiology and transmission dynamics of HIV, with a focus on high-risk and bridge populations, and explain the key factors that contribute to the spread of the virus in the general population.
- Discuss the National AIDS Control Programme in India and how it defines key populations/ high risk groups and bridges populations in context of HIV/AIDS transmission, and why are they a priority for intervention?
- Explain the key indicators and data sources used in HIV surveillance in India, and how do these contribute to understanding the epidemic's progression?
- Describe HIV prevalence estimated and monitored among different age groups, different population groups, genders, and regions within India, and what information do these data provide?

Dermatology (DR11)

DR11.1: Describe the etiology, pathogenesis and clinical features of the dermatologic manifestations of HIV and its complications including opportunistic infections.

DR11.2: Identify and distinguish the dermatologic manifestations of HIV, its complications, opportunistic infections and adverse reactions

DR11.3: Enumerate the indications and describe the pharmacology, administration and adverse reaction of pharmacotherapies for dermatologic lesions in HIV

Otorhinolaryngology (ENT) (EN4.53)

EN4.53: Describe the Clinical features, Investigations and principles of management of HIV manifestations of the ENT.

Respiratory Medicine (CT1)

CT1.3: Discuss and describe the impact of co-infection with HIV and other co-morbid conditions. Like diabetes on the natural history of tuberculosis

CT1.9: Order and interpret diagnostic tests based on the clinical presentation including: CBC, Chest X ray PA view, Mantoux, sputum culture and sensitivity, pleural fluid examination and culture, HIV testing.

Orthopaedics (OR3)

OR3.1: Describe and discuss the aetiopathogenesis, clinical features, Investigations and principles of management of Bone and Joint infections

a) Acute Osteomyelitis

b) Subacute osteomyelitis

c) Acute Suppurative arthritis

d) Septic arthritis & HIV infection

e) Spirochaetal infection

f) Skeletal Tuberculosis

History and examination of Patient's wife:

His wife is 22 years old, Primigravida with 20 weeks of pregnancy. She is asymptomatic and there are no antenatal complications. On screening she is found to be HIV positive.

Obstetrics & Gynecology (OG12, 27, 35)

OG12.7: Describe and discuss screening, risk factors, management of mother and newborn with HIV.

OG27.3: Describe and discuss the etiology, pathology, clinical features, differential diagnosis, investigations, management and long-
term implications of HIV.

OG35.11: Demonstrate the correct use of appropriate universal precautions for self-protection against HIV and hepatitis and counsel patients.

Specific Learning Objectives:

- Discuss the screening of HIV during pregnancy.
- Describe the risk of mother to child transmission of HIV infection during antenatal, intranatal and postnatal periods.
- Discuss the factors affecting risks of vertical transmission.
- Describe the various strategies to reduce the risk of mother to child transmission of HIV infection
- Discuss the investigations and management of the pregnant woman with HIV positive during antenatal, intrapartum and post-natal periods.
- Discuss the care of neonate for prevention of HIV transmission.
- Enumerate the ART regime, their doses, side effects, used for prevention of HIV from mother to child.
- Describe Prevention of Parent to Child Transmission of HIV (PPTCT) program under NACO in India.

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FEVER OF UNKNOWN ORIGIN: LINKER CASE

Team Leader: Dr Smita Nath (Department of Medicine)

Collaborating Departments

Physiology, Pathology, Microbiology, Pharmacology, Respiratory Medicine, Medicine, Paediatrics

Patient profile and history

Sam, a 16-year-old male with no significant medical illness in the past visited OPD with Chief complaints of intermittent fever (100 - 101°F) for the past 30 days. Fever is intermittent with no diurnal variation or associated chills and rigor. The patient gives a history of night sweats The fever is relieved with antipyretic medication. The patient's mother says that the child has lost weight as his clothes have become loose fitting and his appetite has decreased. A history of increasing fatigue and generalized weakness is present.

No history of headache, vomiting, joint pain, rash, bleeding diathesis, jaundice, pain abdomen, altered bowel habits, dysuria, or respiratory complaints are present.

Clinical examination

General examination- Pallor - Mild, no jaundice, no Lymphadenopathy, no thyromegaly, No neurocutaneous markers, No cyanosis, clubbing, or B/L pitting pedal oedema.

Systemic examination – Within normal limits.

Initial laboratory investigation

Hb- 10.4 gm%

TLC- 6000/ µL

DC- L - 55%, N- 40%, E- 4%, B - 1%

Platelets - 1.5 lakh/ µL

KFT- Serum urea- 25 mg/dL, serum creatinine - 0.9 mg/dL

LFT- Bilirubin (total)- 1mg/dL, Bilirubin (direct)- 0.4 mg/dL, AST-23 IU, ALT-18 IU, ALP-110 IU

Serum protein- 8.5 gm/dL Serum Albumin - 3.8 gm/dL

Ultrasound abdomen- within Normal Limit

X-ray Chest - WNL

Blood culture – Sterile, Urine Culture - No growth

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INTEGRATION

Physiology

PY11.1 Describe and discuss mechanism of temperature regulation

PY11.2 Describe and discuss adaptation to altered temperature (heat and cold)

PY11.3 Describe and discuss mechanism of fever, cold injuries and heat stroke.

Specific Learning Objectives:

- Explain the concept of homeostasis as it pertains to body temperature.
- Define normal body temperature range and the factors that can influence it.
- Identify and describe the physiological mechanisms involved in heat production and heat loss.
- Explain the physiological responses initiated by the hypothalamus to maintain temperature homeostasis (e.g., sweating, shivering).
- Explain the physiological adaptations to extreme temperatures.

Pathology

PA4.1 Define and describe the general features of acute and chronic inflammation including stimuli, vascular and cellular events

PA4.2 Enumerate and describe the mediators of acute inflammation

PA4.3 Define and describe chronic inflammation including causes, types non-specific and granulomatous and enumerate examples of each

PA4.4 Identify and describe acute and chronic inflammation in gross and microscopic specimens

M4.16 Enumerate the indications and describe the findings in tests of inflammation and specific rheumatologic tests, serologic testing for pathogens including HIV, bone marrow aspiration and biopsy

Microbiology

MI2.2 Describe the classification, etio-pathogenesis, clinical features and discuss the diagnostic modalities of Infective endocarditis

MI2.5 Describe the etio-pathogenesis and discuss the clinical evolution and the laboratory diagnosis of kalazaar, malaria, filariasis and other common parasites prevalent in India

MI2.6 Identify the causative agent of malaria and filariasis

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MI2.7 Describe the epidemiology, the etio- pathogenesis evolution complications, opportunistic infections, diagnosis prevention and the principles of management of HIV

MI3.3 Describe the enteric fever pathogens and discuss the evolution of the clinical course, the laboratory diagnosis of the diseases caused by them

MI3.4 Identify the different modalities for diagnosis of enteric fever. Choose the appropriate test related to the duration of illness

MI3.7 Describe the epidemiology, the etio- pathogenesis and discuss the viral markers in the evolution of Viral hepatitis. Discuss the modalities in the diagnosis, and prevention of viral hepatitis

MI5.1 Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of meningitis

MI5.2 Describe the etiopathogenesis, clinical course and discuss the laboratory diagnosis of encephalitis

MI5.3 Identify the microbial agents causing meningitis

MI6.1 Describe the etio-pathogenesis, laboratory diagnosis and prevention of Infections of upper and lower respiratory tract

MI6.2 Identify the common etiologic agents of upper respiratory tract infections (Gram Stain)

MI6.3 Identify the common etiologic agents of lower respiratory tract infections (Gram Stain & Acid fast stain).

MI7.3 Describe the etio-pathogenesis, clinical features, the appropriate method for specimen collection, and discuss the laboratory diagnosis of Urinary tract infections

MI8.1 Enumerate the microbial agents and their vectors causing Zoonotic diseases. Describe the morphology, mode of transmission, pathogenesis and discuss the clinical course, laboratory diagnosis and prevention.

Specific Learning Objectives:

- Define and classify pyrexia of unknown origin (PUO).
- Enlist the various infective and non-infective causes of PUO.
- Describe the algorithm for diagnosis of PUO.

Pharmacology

PH1.16 Describe mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs which act by modulating autacoids, including: antihistaminics, 5-HT modulating drugs, NSAIDs, drugs for gout, anti-rheumatic drugs, drugs for migraine

PH1.38 Describe the mechanism of action, types, doses, side effects, indications and contraindications of corticosteroids

Respiratory Medicine

CT1.5 Elicit, document and present an appropriate medical history that includes risk factor, contacts, symptoms including cough and fever CNS and other manifestations

Medicine

IM4.1 Describe and discuss the febrile response and the influence of host immune status, risk factors and comorbidities on the febrile response

IM4.2 Describe and discuss the influence of special populations on the febrile response including: the elderly, immune suppression, malignancy and neutropenia, HIV and travel

IM4 3. Discuss and describe the common causes pathophysiology and Discuss and describe the common causes, pathophysiology and manifestations of fever in various regions in India including bacterial, parasitic and viral causes (e.g.Dengue, Chikungunya, Typhus)

IM4.4 Describe and discuss the pathophysiology and manifestations of inflammatory causes of fever

IM4.5 Describe and discuss the pathophysiology and manifestations of malignant causes of fever including hematologic and lymph node malignancies

IM4.6 Discuss and describe the pathophysiology and manifestations of malaria

IM4.7 Discuss and describe the pathophysiology and manifestations of the sepsis syndrome

IM4.8 Discuss and describe the pathophysiology, aetiology and clinical manifestations of fever of unknown origin (FUO) including in a normal host neutropenic host nosocomial host and a host with HIV

IM4.9 Elicit document and present a medical history that helps delineate the aetiology of fever that includes the evolution and pattern of fever, associated symptoms, immune status, comorbidities, risk factors, exposure through occupation, travel and environment and medication use

Pediatrics

PE34.14 Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of fever in children

PE34.15 Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of child with exanthematous illnesses like Measles, Mumps, Rubella & Chicken pox

PE34.16 Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of child with Diphtheria, Pertussis, Tetanus.

PE34.17 Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of child with Typhoid

PE34.18 Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of child with Dengue, Chikungunya and other vector born diseases

PE34.19 Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of children with Common Parasitic infections, malaria, leishmaniasis, filariasis, helminthic infestations, amebiasis, giardiasis

PE34.20 Enumerate the common causes of fever and discuss the etiopathogenesis, clinical features, complications and management of child with Ricketsial diseases

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CARCINOMA CERVIX CLINICAL STAGE IB2: LINKER CASE

Team Leader: Dr Rashmi (Department of Obstetrics & Gynaecology)

Collaborating Departments

Anatomy, Biochemistry, Pathology, Pharmacology, Microbiology, Community Medicine, Obstetrics & Gynaecology, Radiodiagnosis and Radiotherapy

Patient profile and history

Beena, a 55 years old P4L4 postmenopausal woman from low socio-economic status, presented to Gynecology OPD with complaint of post-coital bleeding and foul-smelling discharge for the past 6 months. There was history of loss of weight and appetite. There was no history of pain abdomen, urinary or bowel complaints.

There was history of post-coital bleeding 15 years back for which she had visited a clinic. She got some testing done and she underwent some day care vaginal procedures without any anaesthesia. She didn't follow up after that and had lost all records.

Menstrual History

She has been postmenopausal for the last 10 years. Before that, her menstrual cycles were regular and normal.

Obstetric History

She is married for 40 years. Age at first intercourse was 15 years.

She is P4L4

All full-term normal vaginal deliveries without any complications. The first child was born at the age of 16 years.

Contraceptive History

She never used any contraception

Personal History

Vegetarian, Chronic Bidi Smoker

Husband: truck driver

Examination:

GC Fair

Thin Built. Height- 5 ft, Weight- 40 kg, BMI: 17.22 kg/m^2

Pallor + moderate, (clinically Hb around 8 gm%), No Icterus,

Pulse: 90/min, regular, BP: 110/70mm Hg

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No pedal edema, No Lymphadenopathy

Chest, CVS: NAD

Breasts: Normal, NAD

P/A: Soft, No organomegaly, No free fluid

Local Genital examination: Vulva Normal

Per Speculum Examination: An irregular exophytic growth of 3X2 cm present on the anterior lip of the cervix, irregular surface, bleeds on touch

Vaginal mucosa normal

Per Vaginum Examination: Anterior lip of cervix replaced with irregular growth, hard in consistency, posterior lip and vagina not involved. Bilateral fornices free

P/V/R: Parametrium free. Rectal Mucosa free

Provisional Clinical Diagnosis: Carcinoma Cervix Clinical Stage IB2

Management

Cervical punch biopsy taken

Histopathology Report: Large Cell Keratinizing Squamous Cell Carcinoma of the cervix

Further Plan of management:

Radical Hysterectomy with B/L salpingo-oophorectomy and Pelvic Lymphadenectomy

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INTEGRATION

Obstetrics & Gynaecology: OG33

OG33.1 Classify, describe and discuss the etiology, pathology, clinical features, differential diagnosis, investigations and staging of cervical cancer

OG33.1a Enumerate the risk factors and causes of cervical cancer

OG33.1b Classify the histopathologic types of cervical cancer

OG33.1c Describe the latest FIGO staging of Cervical Cancer

OG33.1d Describe the signs & symptoms of cervical cancer

OG33.1e Discuss the differential diagnosis of Cervical cancer

OG33.1f Write the investigations required for diagnosis and work-up for management of cervical cancer

OG33.1g Enumerate various HPV vaccines and describe their schedule and effectiveness

OG 33.2: Describe the principles of management including surgery and radiotherapy of Benign, Pre-malignant (CIN) and malignant Lesions of the Cervix

OG33.2a Classify benign, premalignant and malignant lesions of the cervix

OG33.2b Describe the development of CIN from the transformation zone and its progression to invasive cancer.

OG33.2c Discuss the management of benign lesions of cervix.

OG33.2d Discuss cervical cancer screening methods and evaluation of abnormal screening results

OG33.2e Discuss the various treatments of CIN1, CIN2 and CIN3 in terms of ablative and excisional methods.

OG33.2f Describe the follow-up after treatment

OG33.2g Describe the stage-wise treatment plan of ca cervix according to the new FIGO staging

OG33.2h Enumerate the advantages and disadvantages of surgery and radiotherapy over each other

OG33.2i Describe various types of hysterectomies & enumerate the components of radical hysterectomy

OG33.2j Describe the basic principles and techniques of radiotherapy.

OG33.k Discuss the follow-up after treatment

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Anatomy: AN48

AN48.2 Describe & demonstrate the (position, features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage, and clinical aspects of) important male & female pelvic viscera *(Cervix)*

AN48.3 Describe & demonstrate the origin, course, important relations, and branches of the internal iliac artery

Biochemistry: BI10

BI10.1 Describe the cancer initiation, promotion of oncogenes & oncogene activation. Also, focus on p53 & apoptosis.

BI10.2 Describe various biochemical tumor markers and the biochemical basis of cancer therapy.

Specific Learning Objectives:

- Describe the mechanism of cancer initiation
- Describe the different mechanism involved in activation of protooncogenes and suppression of tumor suppressor genes
- Describe the pathways of apoptosis and role of p53 as guardian of genome
- Enumerate tumor markers and define the ideal characteristics of tumor markers.
- Enumerate and classify chemotherapeutic agents. Describe the mechanism of action of different classes of chemotherapeutic agents.
- Describe the biochemical basis of radiotherapy and immunotherapy in cancer treatment.

Pharmacology: PH1

PH1.54 Describe vaccines and their uses (***HPV Vaccine)***

Pathology: PA30

PA30.1 Describe the epidemiology, pathogenesis, etiology, pathology screening, diagnosis and progression of carcinoma of the cervix

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Microbiology: MI8

MI8.3 Describe the role of oncogenic viruses in the evolution of virus associated malignancy *(HPV Virus and cervical cancer)*

Specific Learning Objectives:

- Discuss in brief morphology & laboratory diagnosis of human papilloma virus infection.

Radiotherapy: RT4,5

RT4.5 Describe and discuss role of radiation in management of common malignancies in India (region-specific)

RT5.1 Describe and discuss cancer prevention, screening, vaccination, cancer registry

Radiodiagnosis: RD1

RD1.4 Enumerate indications for various common radiological investigations, choose the most appropriate and cost-effective method and interpret findings in common conditions pertaining to disorder in Ob & Gy ***(Cervical Cancer)***

Community Medicine: CM7,8

CM 7.6 Enumerate and evaluate the need for screening tests Screening for Ca cervix at the Primary health care level methods of screening

CM 8.2 Disease-specific National Health Programmes - National Programme for Prevention and Control of NCDs.

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List of abbreviations used

AFB: Acid Fast Bacilli

AST: Aspartate Aminotransferase

ALT: Alanine Transaminase

BMI: Body Mass Index

CBC: Complete Blood Count

CBNAAT: cartridge-based nucleic acid amplification test

DLC: Differential Leucocyte Count

DOTS: Directly Observed Treatment Short-course

ESR: Erythrocyte Sedimentation Rate

Hb: Hemoglobin

HIV: Human Immuno- deficiency Virus

HPE: Histo Pathological Examination

IU: International Unit

LFT: Liver Function Test

KFT: Kidney Function Test

TB : Tuberculosis

TLC: Total Leucocyte Count

TSH: Thyroid Stimulating Hormone

TVS: Trans Vaginal Sonography

USG: Ultra Sonography

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