

INTRODUCTION TO PATHOLOGY

WHAT IS PATHOLOGY?

- Def. Pathology is study of disease/suffering (pathos/logos) and its causation.
- Disease is any alteration of Health
- WHO Def. of Health: is a complete well being: Physically, Mentally and Socially.
- Core substances in pathology:
 - 1. Etiology
 - 2, Morphology
 - 3, Pathogenesis and
 - 4, Manifestation

SUBDIVISIONS OF PATHOLOGY

- Histopathology: The investigation & diagnosis of disease from the examination of tissues architectural organization
- Cytopathology: The investigation & the diagnosis of disease from the examination of isolated cells
- Hematology: The study of the disorders of the cellular & coagulable components of blood

TECHNIQUES OF PATHOLOGY

- Light Microscopy- appreciates the structure of tissues & cells in health & disease
- Histochemistry- is the study of the chemical component and their distribution in tissues
- Immunohistochemistry- is histologic study employing antibodies and antigen reaction to visualize substances in tissues sections or cell preparations

- Electron Microscopy- study of disorders at very high magnification, 1,000,000 times; at organelle level & demonstration of viruses in tissue samples
 - Biochemical assays- **Fluid** & electrolyte homeostasis, serum enzyme assays e.g. raised levels of cardiac enzymes in the blood
 - Radioisotope techniques (Autoradiography): Scans diseases using intake of different isotopes eg. Thyroid diseases by iodine isotopes
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- Molecular Pathology- Uses advances of new science, molecular pathology eg. in the study of genetic defects, using DNA technology; eg. IN SITU HYBRIDISATION in different diseases.

GENERAL & SYSTEMATIC PATHOLOGY

- General Pathology: is teaching of our current understanding of the causation, mechanisms and characteristics of the major categories of disease (e.g. congenital, acquired, inflammation, tumors or degenerations)
- Systematic Pathology: is teaching of our current knowledge of specific diseases as they affect individual organs or systems (e.g. appendicitis, lung cancer, atheroma).

WHAT SHOULD WE LEARN IN PATHOLOGY?

- A logical & orderly way of thinking about diseases & their characteristics:
 - Incidence and prevalence
 - Etiology
 - Pathogenesis
 - Pathological (morphologic) features
 - Clinical features (manifestations)
 - Diagnoses
 - Complications and sequelae
 - Prognosis

MORPHOLOGY

- Def.: Structural alterations underlying diseases, progressively or regressively to give different manifestations.
- The different morphologic alterations can be
 - Early as Molecular
 - Late as Gross (necked eye) changes
 - Intermediates can be seen in microscopy :
 - Routinely by Light microscopy or
 - Electrone microscopy, not yet routine except, in few cases such as renal diseases.

PATHOGENESIS

- Def.: Development of disease altering the structure progressively or even regressively. This is the knowledge it helps us predict the out come of disease or prognosis.
- The mechanism through which the etiology (cause) operates to produce the morphological alterations and clinical manifestations.

CLINICAL MANIFESTATION

- Def.: Characteristics representing underlying morphologic alterations which they alter the Anatomical, Biochemical and Physiological which the patient may complain or the clinician appreciates.

ETIOLOGY OF DISEASES

- Def. Etiology is cause of disease
- General Features of etiology
 - Single or multiple causes of a disease
 - Single cause a particular disease of different severity
 - Some times no disease by the particular etiology

ETIOLOGY OF DISEASES

- Important terms related to etiology;
 - Pathogenesity: the power of inflicting disease of by an etiology, particularly of infectives
 - Susceptibility: The liability of a person to acquire a particular disease
 - Associated factors: Factors contributing to the severity or occurrence of a particular disease.

CLASSIFICATION OF ETIOLOGY

- Genetic : Inherited chromosomal abnormality or mutations
- Acquired: causes disease after birth
- Dietary deficiency: Usually multiple and complex deficiency of diets. Not usually due to inadequate intake (eg.defective absorption)
- Dietary over intake: Obesity, Diabetes M, Hypertension and heart diseases

CLASSIFICATION OF ETIOLOGY

- Physical agents: Trauma, Heat and cold, electricity, radiation, atmospheric pressure
- Chemicals: Drugs, Industrial products (agriculture or home use)
- Infective microorganisms
- Immunologic
- Psychogenic: Acquired mental illness, addiction, Psychosomatics (Peptic Ulcer)

DIAGNOSTIC PATHOLOGY

- Biopsies are samples of tissue removed from a patient for diagnostic purposes.
- Biopsies can be obtained by a variety of methods:
 - Needle biopsy
 - Endoscopic biopsy
 - Incisional biopsy
 - Excisional biopsy (resections)
- Cytology involves the examination and interpretation of dispersed cells rather than solid tissues, usually for the diagnosis of cancer & pre-cancerous lesions.

AUTOPSIES

- Autopsy (post- mortem examination)
- Autopsy means examination of a deceased body
- Necropsy: Tissue samples from autopsy
- Autopsies are used for:
 - Determining the cause of death
 - Audit of the accuracy of clinical diagnosis
 - Education of undergraduates & postgraduates
 - Research into the causes and mechanisms of disease
 - Gathering accurate statistics about disease incidence

PRINCIPLES OF DISEASE

- Death: is the session of life.
- There are four types of death, they are
 - Natural
 - Accidental
 - Suicide
 - homicide
- Changes after death: Cadaveric spasm, Body cooling, Post mortem lividity, Rigor mortis, Decomposition and Mammification

THANK YOU