

Lecture 1

Introduction to pathology

Pathology is the scientific study (logos) of disease (pathos). It mainly focuses on the study of the structural and functional changes in cells, tissues, and organs in disease.

Study of pathology can be divided into **general** pathology and **systemic** pathology.

- **General pathology:** It deals with the study of mechanism, basic reactions of cells and tissues to abnormal stimuli and to inherited defects.
- **Systemic pathology:** This deals with the changes in specific diseases/responses of specialized organs and tissues.

Etiology

The etiology of a disease is its cause. The causative factors of a disease can be divided into two major categories: **genetic** and **acquired** (e.g. infectious, chemical, hypoxia, nutritional, physical).

Most common diseases are multifactorial due to combination of causes.

Pathogenesis

It refers to the mechanism by which the causative factor produces structural and functional abnormalities.

Pathogenesis deals with sequence of events that occur in the cells or tissues from the beginning of any disease process.

Latent period: Few causative agents produce signs and symptoms of the disease immediately after exposure. Usually, etiological agents takes some time to manifest the disease (e.g. carcinogenesis) and this time period is called as the latent period. It varies depending on the disease.

Incubation period: caused by infectious (due to bacteria, viruses, etc.) agents, the period between exposure and the development of disease is called the incubation period. It usually ranges from days to weeks.

Molecular Pathology

Most of the diseases can be diagnosed by the morphological changes in tissues. But, with the present advances in diagnostic pathology, the diseases can be analyzed by the molecular and immunological approaches. Molecular pathology has revealed the biochemical basis of many diseases, mainly congenital disorders and cancer. These techniques can detect changes in a single nucleotide of DNA. In situ hybridization can detect the presence of specific genes or their messenger RNA in tissue sections or cell preparations. Minute quantities of nucleic acids can be amplified by the use of the

polymerase chain reaction. DNA microarrays can be used to determine patterns of gene expression (mRNA).

Pathology/ 4th class / Dr. Wafaa FH