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Microbiology of Tuberculosis: Etiology, Pathogenesis and Diagnostics

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Abstract: Tuberculosis (Mycobacterium tuberculosis) in the world the most many widespread contagious from diseases one In this article, M. tuberculosis bacteria microbiological characteristics, processes of pathogenesis, man immune interact with the system effect and modern diagnosis methods about information given. Also, the microbiology of tuberculosis to medicines endurance mechanism and related to new therapeutic approaches aspects also seeing is out.

Keywords: Tuberculosis (TB), Mycobacterium tuberculosis, Etiology, Pathogenesis, Diagnostics, Infection, Pulmonary tuberculosis, Extrapulmonary tuberculosis, Latent TB infection (LTBI).

Introduction.

Tuberculosis is an infectious disease caused by the bacterium Mycobacterium tuberculosis, which is transmitted through the respiratory tract and mainly affects the lung tissue. The bacteria are acid-fast. durable being, outwardly in the environment far term can be saved. This disease humanity in history the most many to death reason was from infections one is, is now on the day also serious problem is considered.

World health to keep organization (WHO) information according to, every year about 10 million people to tuberculosis it rings and 1.5 million more sick death is enough Especially immune system weakened in individuals and HIV infection in the ringing disease heavy It will pass.

Materials and methods

Tuberculosis microbiology in this study according to various information analysis was done. Main research sources :

Morphological and tincture features (Ziehl-Neelsen paint method);

Culture methods (Lowenstein-Jensen in the environment bacteria cultivation);

Molecular genetic analyzes (PCR, GeneXpert, LAMP);

Serological tests (Interferon-Gamma Release Assays - IGRA);

Microscopic examinations (fluorescent microscopy).

Results.

Etiology

Mycobacterium tuberculosis - to acid It is a resistant, aerobic bacterium cell wall mikol rich in acids. These mycobacteria are classically gram- stained It cannot be painted with this method. and special paint through methods (Ziehl-Neelsen, Auramine-Rhodamine). is determined.

Tuberculosis bringing issuer main mycobacteria to the complex the following includes :

M. tuberculosis - in humans tuberculosis main causer ;

M. bovis – cattle in animals occurs and to people infection possible ;

M. africanum – in the African region wide widespread ;

M. microti – mainly in rodents It happens.

Pathogenesis

Tuberculosis infection development process following stages includes :

Infection - aerosol through of bacteria to the lungs descent.

Primary answer - alveolar macrophages bacteria swallowed can, but him/her no in doing to difficulty shower comes.

Granuloma formation - immune system of bacteria spread restriction for granulomatosis fabric harvest does.

Latent tuberculosis is immune system bacteria control as but they are of the organism with weakening again activation possible.

Active disease - bacteria multiply, lung fabrics or other members It is harmful.

Diagnostics

Tuberculosis diagnosis for various laboratory methods used :

Microscopic examination : to acid durable bacteria Ziehl-Neelsen paint in the microscope with the method is seen.

Culture method : Lowenstein-Jensen in the environment bacteria multiplication

Molecular methods : PCR and GeneXpert methods determines the DNA of mycobacteria.

Skin test (Mantoux): to tuberculin answer reaction inspection.

IGRA (Interferon-Gamma) Release Assay : immunoassay of the system reaction assessment to tuberculosis antigens for produced against interferon-g the release measurement

Discussion.

Microbiology of tuberculosis according to take visited research of mycobacteria far term latent in the case preservation to the ability owner that it is confirms. Bacteria cell wall strong protection to the nature owner was for majority antibiotics to him impact does not.

For medicines durable tuberculosis prevalence (MDR-TB, XDR-TB) is global health to keep system for serious from problems one as remaining. Urgent diagnosis methods, in particular, GeneXpert and by Next-Generation Sequencing (NGS). bacteria endurance profile quickly and exactly determination opportunity exists.

Conclusion.

Tuberculosis bringing issuer of bacteria microbiological characteristics better understanding the disease early diagnosis and effective treatment for important Modern diagnosis methods and new antibiotics creation through to medicines endurance the problem overcoming possible.

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