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ملاحظات:
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Retrospective study for TB cases in Kafr El-Shiekh Chest Hospital during the period between January 2010 and January 2019 and role of GeneXpert in diagnosis

Thesis

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Aml Yossif

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List of Abbreviations

Abb.	Full term
AAFB	Alcohol and acid-fast bacillus
ADH	Antidiuretic hormone
AFB	Acid-fast bacilli
AIDS	Acquired immunodeficiency syndrome
ALT	Alanine aminotransferase
ART	Antiretroviral therapy
BCG	Bacillus Calmette-Guérin
CAP	Community-acquired pneumonia
CBC	Complete blood cell
CDC	Centers for Disease Control and Prevention
CMV	Cytomegalovirus
COPD	Chronic obstructive pulmonary disease
CT	Computed tomography
DNA	Deoxyribonucleic acid
DOT	Directly observed therapy
ELISA	Enzyme-linked immunosorbent assay
ELISpot	Enzyme-linked immunospot
FDA	Food and Drug Administration
GI	Gastrointestinal
HIV	Human immunodeficiency virus
IFN-gamma	Interferon-gamma
IGRA	Interferon-gamma release assay
IL	Interleukin
IV	Intravenous
MDDR	Molecular detection of drug resistance
MDR-TB	Multi-Drug Resistant Tuberculosis

List of Abbreviations Cont...

Abb.	Full term
MODS	Microscopic-observation drug susceptibility
MRI	Magnetic resonance image
MTBC	Mycobacterium tuberculosis complex
MTD	Mycobacterium tuberculosis direct
NAA	Nucleic acid amplification
NAAT	Nucleic acid amplification testing
NPV	Negative predictive value
NTP	National Tuberculosis control Program
PA	Posteroanterior
PCR	Polymerase chain reaction
PET	Positron emission tomography
PFGE	Pulsed field gel electrophoresis
PPD	Purified protein derivative
PPV	Positive predictive value
QFT-GIT	QuantiFERON-TB Gold In-Tube
RIF	Resistance to rifampin
RNA	Ribonucleic acid
SAT	Self-administered therapy
SPECT	Single-photon emission CT
TB	Tuberculosis
TLA	Thin-layer agar
TNF-α	Tumor necrosis factor–alpha
VNTR	Variable numbers of tandem repeats
WHO	World Health Organization
XDR-TB	Extremely Multi-Drug Resistant Tuberculosis

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INTRODUCTION

Tuberculosis is a contagious bacterial disease, that is caused by infection with TB bacilli either by inhalation, ingestion or direct contact with TB bacilli ***(Caylà and Orcau, 2011).***

Anyone can get tuberculosis, but certain factors can increase the risk of the disease. These factors include: weakened immune system, malnutrition, very young or advanced age, poverty and substance abuse and health care work ***(Zachary, 2015).***

Early detection of the disease, effective chemotherapy and prevention of transmission of the disease is an important factors for decline of TB cases ***(World Health Organization, 2015).***

The prevalence rate of TB in Egypt was 26 per 100,000 people according to the World Health Organization (WHO) estimate in 2014, while the incidence rate was 15 per 100,000 people.

Screening, diagnosis, notification and registration of TB cases was implemented all over Egypt according to national TB strategy of the National Tuberculosis control Program (NTP) ***(National Tuberculosis control program, 2016).***

Recent methods for diagnosis of TB bacilli like gene expert which diagnose and show the sensitivity of TB bacilli to rifampicin and the new method for treatment and give us great help for diagnosis and proper treatment of TB.

Aim of the Work

The aim of this study is to find out tuberculosis pattern in Kafr EL-Shiekh Governorate during the period between January 2010 and January 2019 and role of GeneXpert in diagnosis of TB.

Chapter 1

TUBERCULOSIS

Tuberculosis (TB) is an ancient human disease caused by *Mycobacterium tuberculosis* which mainly affects the lungs, making pulmonary disease the most common presentation. However, TB is a multi-systemic disease with a protean presentation. The organ system most commonly affected include the respiratory system, the gastrointestinal (GI) system, the lymphoreticular system, the skin, the central nervous system, the musculoskeletal system, the reproductive system, and the liver.Evidence of TB has been reported in human remains dated thousands of years. For a human pathogen with no known environmental reservoir, Mycobacterium tuberculosis has honed the art of survival and has persisted in human communities from antiquity through modern time ***(Adigun et al., 2020).***

Etiology

M. tuberculosis causes tuberculosis. *M. tuberculosis* is an alcohol and acid-fast bacillus. It is part of a group of organisms classified as the *M. tuberculosis* complex. Other members of this group are, *Mycobacterium africanum, Mycobacterium bovis,* and *Mycobacterium microti*. Most other mycobacteria

organisms are classified as non-tuberculous or atypical mycobacterial organisms ***(Forbes et al., 2018).***

M. tuberculosis is a non-spore forming, non-motile, obligate-aerobic, facultative, catalase negative, intracellular bacteria. The organism is neither gram-positive nor gram-negative because of very poor reaction with the Gram stain. Weakly positive cells can sometimes be demonstrated on Gram stain, a phenomenon known as "ghost cells. "The organism has several unique features compared to other bacteria such as the presence of several lipids in the cell wall including mycolic acid, cord factor, and Wax-D. The high lipid content of the cell wall is thought to contribute the following properties of *M. tuberculosis* infection: ***(Jilani et al., 2020)***

- Resistance to several antibiotics
- Difficulty staining with Gram stain and several other stains
- Ability to survive under extreme conditions such as extreme acidity or alkalinity, low oxygen situation and intracellular survival(within the macrophage)

The Ziehl-Neelsen stain is one of the most commonly used stains to diagnose T.B. The sample is initially stained with carbol fuchsin (pink color stain), decolorized with acid -alcohol and then counter-stained with another stain(usually, blue