

**Correlation between Serum Adenosine
Deaminase and Cancer Antigen 125 in
Assessment of Severity of Active
Pulmonary Tuberculosis**

Thesis

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List of Abbreviations

Abb.	Full term
ADA	Adenosine deaminase
AFB	Acid fast bacilli
AIDS	Autoimmune disease
ATS	American Thoracic Society
ATT	Antituberculous therapy
BCG	Bacillus-calmette guerin
BMI	Body mass index
CA125	Cancer antigen 125
CDC	Centers for Disease Control and Prevention
CDR	Case detection rate
CLD	Chronic liver disease
CRF	Chronic renal failure
CT	Computed tomography
CTP	Child-turcotte pugh
DOTS	Directly observed treatment strategy
DRS	Drug resistance survey
DRTB	Drug resistant tuberculosis
DST	Drug sensitivity test
EHNA	Erythro-9-(2Hydroxyl-3-Nonyl)adenine
ESR	Erythrocyte sedimentation rate

Abb.	Full term
HIO	Health insurance organization
HIV	Human immunodeficiency virus
IGRA	Interferon gamma release assay
INH	Isoniazide
IV	Intravenous
LJ	Lowenstein-jensen medium
LTBI	Latent tuberculous infection
MDR	Multi-drug resistance
MHD	Maintenance hemodialysis
MTB	Mycobacterium tuberculosis
MTBC	Mycobacterium-tuberculosis complex
MUC 16	Mucin 16
NTM	Non -tuberculous mycobacterium
NTP	National tuberculosis program
PA	Posteroanterior
PAS	ParaAmino salicylic acid
PCR	Polymerase chain reaction
PPD	Purified protein derivative
PZA	Pyrazinamide
RIF	Rifampicin
RT	Renal transplantation

 List of Abbreviations

Abb.	Full term
SCC	Short course chemotherapy
SCID	Severe combined immunodeficiency
SEA	Sea urchin sperm protein Enterokinase and Agrin
SPSS	Statistical package for social science
TB	Tuberculosis
WHO	World Health Organization
XDR	Extensively drug resistant
ZNNM	Ziehl-neelsen

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Introduction

Across the world tuberculosis (TB) remains an important public health problem, especially in developing countries. One third of the world's population is infected with *Mycobacterium tuberculosis*. Every year almost 2 million people die from TB, most of them in low- and middle-income countries **(WHO, 2011)**.

In 2014, there were 9.6 million cases of active TB which resulted in 1.5 million deaths. More than 95% of deaths occurred in developing countries. The number of new cases each year has decreased since 2000 **(CDC, 2012)**.

Tuberculosis (TB) is an infectious disease caused by the bacterium *Mycobacterium tuberculosis* (MTB). Tuberculosis generally affects the lungs, but can also affect other parts of the body **(CDC, 2012)**.

Tuberculosis is spread through the air when people who have active TB in their lungs cough, spit, speak, or sneeze **(Kuyucu et al., 1999)**.

The classic symptoms of active TB are chronic cough with blood-containing sputum, fever, night sweats, and weight loss **(CDC, 2012)**. The historical term

"**consumption**" came about due to the weight loss (**WHO, 2015**).

Symptoms may include chest pain and a prolonged cough producing sputum. Occasionally, people may cough up blood in small amounts, and in very rare cases, the infection may erode into the pulmonary artery, resulting in massive bleeding (**Jhamaria et al., 1988**), (**Sakuraba et al., 2009**).

A positive acid-fast bacilli (AFB) smear and/or culture of *Mycobacterium* spp. is the gold standard for the diagnosis of TB. Although smear positivity correlates well with infectivity, much of the transmission occurs before the level of bacilli reach 10 000/ml in the sputum (**Caulfield and Wengenack, 2016**).

Chest radiograph provides only a probable diagnosis; they are sometimes difficult to differentiate from other causes of lung shadows, such as pneumonia and malignancies (**Stead et al., 1985**).

To prepare mycobacterium culture, which is the golden standard for TB diagnosis, it may take 8 weeks. Finding acid-fast bacilli is the quick screening method for pulmonary TB diagnosis; nevertheless, its sensitivity is low. The polymerase chain reaction (PCR) test for TB

diagnosis is expensive and it requires skilled personnel and lot of equipments. Therefore, in recent years, there has been a great demand for finding new microbiological, genetic, immunological, and biomedical diagnostic methods to diagnosis TB quickly and accurately. Measuring of adenosine deaminase (ADA) activity is a biomedical method **(Kuyucu et al., 1999), (Jhamaria et al., 1988).**

Also, it was reported that serum Cancer Antigen 125 (CA-125) levels were higher in patients with pulmonary and extra-pulmonary TB than healthy subjects and there have been few reports on the relationship between the activity of pulmonary TB and CA-125 levels **(Yilmaz et al., 2001).**

Aim of Work

The purpose of the present study is to correlate between serum ADA and CA125 levels in assessment of severity of pulmonary tuberculosis.

Tuberculosis

Tuberculosis is a major cause of morbidity and mortality throughout the world. One-third of the world's population is infected with the TB bacillus **(WHO, 2009)**. The global tuberculosis epidemic results in nearly two million deaths and nine million new cases of the disease per year, 95% in developing countries **(Corbett et al., 2003)**.

Once infected active disease develops in about 10% of cases usually within 1-2 years after exposure from TB **(Nettleman et al., 1997)**. The remainder stay in a state of latent tuberculosis infection (LTBI), which can reactivate at a later stage, particularly if the individual is elderly or becomes immune compromised **(Chan et al., 2000)**.

History of Tuberculosis:

Tuberculosis has been present in humans since antiquity. The earliest unambiguous detection of *M. tuberculosis* involves evidence of the disease in the remains of bison in Wyoming dated to around 17,000 years ago **(Rothschild et al., 2001)**.

However, whether tuberculosis originated in bovines, then was transferred to humans, or whether it diverged from a common ancestor, is currently unclear **(Pearce-**