



Original Research Article

Incidence of tuberculosis in Babylon Province-Iraq

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A B S T R A C T

Keywords

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Tuberculosis remains one of most popular health problem in Iraq. This study aims to determine the incidence of tuberculosis in Babylon province-Iraq. The diagnosis of TB cases was based on acid fast stain, cultivation of sputum samples on Lowenstein-Jensen medium histopathological examination for extrapulmonary TB cases. During the period from February to August 2012 sixty TB cases were diagnosed distributed into 40 pulmonary TB and 20 extrapulmonary TB. This study provides a support for the fact that TB stills as a big problem in Babylon- Iraq.

Introduction

Tuberculosis (TB) remains a leading cause of mortality in the world ,WHO(2012) reports more than two billion people about one-third of the world population were estimated to be infected with Mycobacterium tuberculosis . Screening for TB (to diagnose latent TB infection) and prophylactic therapy remain the most important tools to reduce the risk of progression to TB disease among high risk individuals (close contacts, HIV infected individuals, health care workers, etc.) and be considered in endemic countries to reduce the progression from infection to disease (Padmanesan *et al.*, 2013).

The global incidence of tuberculosis (TB) peaked around 2003 and appears to be declining slowly. In 2010, 8.8 million individuals became ill with TB and 1.4 million were died (WHO, 2012).

Each year around 3000 people in Iraq die from this respiratory disease primarily spread by coughing and sneezing. In China has made dramatic progress through domestic investment and international collaboration on TB. Between 1990 and 2010, the TB death rate fell by almost 80%, with deaths falling from 216,000 to 55,000, and the TB prevalence rate was halved (WHO,2012).

This work aims to study the incidence of extra and pulmonary tuberculosis cases in Babylon province –Iraq.

Materials and Methods

Patients

A total of 60 patients with tuberculosis were referred to AL-Hilla consultant clinic

for respiratory diseases after they were suspected to have tuberculosis according to their clinical manifestations and radiological changes. Samples of sputum were collected from 40 patients suffering from pulmonary tuberculosis, as well as, pleural effusion samples were collected from 20 patients suffering from extra pulmonary tuberculosis were also included in this study who diagnosed at private laboratories by histopathology and AFB.

Individuals with other apparent infections such as hepatitis, cancer, diabetes melitus and those who had received prior immunosuppressive therapy or had serious medical illness were excluded from the study. The age of the patients are ranging from (20-65) years old including (42 males) and (18 females).

Diagnosis of Tuberculosis

The diagnosis of TB Based on (a) the acid fast technique which was carried out according to (Forbes *et al.*, 2007), (b) cultivation of sputum on Löwenstein-Jensen medium according to (Brooks *et al.*, 2010), and (c) Histopathological examination in case of extrapulmonary tuberculosis (Ward, 2009).

Results and Discussion

Evaluation of tuberculosis diagnostic techniques

A total of 60 patients, who were suspected to have tuberculosis after showing clinical manifestations and radiological changes for tuberculosis were submitted for conventional laboratory diagnosis and were positive for at least one of the diagnostic criteria. Among these patients, there were 40 pulmonary tuberculosis (PTB) cases who were diagnosed by either

Ziehl-Neelsen staining technique, culture on LJ medium or both. The other 20 cases were extrapulmonary tuberculosis (EPTB) that were diagnosed by histopathology (Biopsy) and AFB for (Pleural effusion) at private laboratories (Table 1).

Of the (EPTB) cases, there were (13) lymphadenitis (cervical and subaxillary), five pleural exudative TB, one gastrointestinal TB and one vertebral lumbar tuberculosis cases (pott's disease) (table 2).

Direct microscopic smear (AFB):

Out of the 40 cases of confirmed pulmonary tuberculosis, there were 26 (65%) AFB smear positive, and 14 (35%) were AFB negative.

The false negative AFB cases (35%), that confirmed by culture positive, can be attributed to the moderate sensitivity for AFB such that it requires 6000 to 10,000 organisms per mL of sample to give true positive result (Raviglione, 2010). Sputum smear microscopy to detect acid-fast bacilli (AFB) is a rapid, inexpensive, relatively easy to perform and highly specific tool for identifying persons with active tuberculosis TB (Laserson *et al.*, 2005). The sensitivity of the AFB smear method is moderate, a study of overseas TB screening for United States immigrant visa applicants reported that the sensitivity of AFB smears to be approximately 34% (Manterola *et al.*, 2003).

In another screening research for AFB sensitivity and specificity made by

Mathew *et al.*, (2002) showed that sputum AFB smears had a sensitivity of (67.5%) and specificity of 97.5%. However, in

Table.1 Distribution of tuberculosis cases

Tuberculosis cases	No. of cases	percentage
Pulmonary	40	66.67
Extrapulmonary	20	33.33

Table.2 Distribution of Extra tuberculosis cases

Site of Tuberculosis	No. of cases
Lymphadenitis	13
Pleural exudative	5
Gastrointestinal	1
Vertibral	1

another research, the specificity and sensitivity of AFB compared to culture was 89% (Fend *et al.*, 2006).

It has been reported that multiple sputum tests in a good laboratory can give a sensitivity of about 90% (Ramachandran *et al.*, 2007). Compared to mycobacterial culture, the sensitivity of a single sputum AFB smear is 30% to 40%, but it increased to reach 65% to 80% with multiple specimens or concentrated sputum (CDC, 2000).

The AFB smear mainly has three main disadvantages:

a- The sensitivity of AFB smear is moderate and variable, such that it requires 6000 to 10,000 organisms per mL of sample to register as positive case (Raviglione , 2010).

b-The direct microscopy cannot distinguish between *M. tuberculosis* and nontuberculous mycobacteria (NTM) (Raviglione , 2010).

c- The technique, although specific, cannot identify drug-resistant strains (MDR-TB) (WHO, 2007).

Culture of sputum on solid LJ medium

Out of the 40 cases of PTB there were 32 (80%) culture positive cases , and 8 (20%) were false negative since those patients were AFB positive. The 8 (20%)culture negative cases of PTB (AFB positive) in this study can be attributed to the anti-TB chemotherapy administration prescribed by physician which may increase the chance of dead *Mycobacterium* that could be stained with AFB.

This result comes true with a study performed by (Sarinet *al .*,2010) showing that most of the smear positive are culture positive, but withtreatment, it increases the chance of dead bacilliand smear positive can be culture negativein 98-100% cases. Mycobacterial culture is highly sensitive than AFB (The threshold for culture to be positive is 100 bacilli per ml of sample), but growth of TB bacilli on traditional solid medium requires 4-8 weeks and consequently delays appropriate treatment in the absence of a confirmed diagnosis (Sarinet *al .*,2010).

Compared to sputum smears, sputum cultures have a much higher sensitivity,

but it is still not high enough (only 82% in a large study). This means that unfortunately, sputum cultures often do not pick up every person with TB, and people can have TB even if the sputum culture results come back negative (WHO, 2007).

From the results expressed above, Tuberculosis remains the commonest infectious diseases with high incidence rate in Babylon Province-Iraq.

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