Prevalence study of tuberculosis among Basrah population through 2011-2015: prospective study

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Abstract. The study records were taken from infectious diseases unite in albasrah general hospital. The data collected from the files of recorded cases through 2011 to 2015. TB patients that attended to this unite which were, including pulmonary and extra pulmonary TB diseases. Their ages were between (few months-70 year). Through 2011 the total patients reached to 58 males and 27 females. The highly risk group was aged 30-39yrs for males and 60-69 yrs for females. In 2012 the total patients reached to 52 males and 25 females. The highly risk group was aged 30-39yrs for males and females. In 2013 the total patients reached to 21 males and 24 females. The highly risk group was aged 30-39yrs for males and 50-59 yrs for females. In 2014 the total patients reached to 19 males and 42 females. The highly risk group was aged 60-69 yrs for males and 20-29 yrs for females. And in 2015 the total patients reached to 31 males and 22 females. The highly risk group was aged 30-39 yrs for males and 30-39 and 50-59 yrs for females. There are statistical differences between all studied age groups through various years P<0.05

Key words: tuberculosis, Basrah

Introduction

Tuberculosis (TB) is a specific infectious disease caused by Mycobacterium tuberculosis. The disease primarily affects lungs and causes Pulmonary TB (PTB). It can also affect intestine, meninges, bones and joints, lymph glands, skin and other tissues of the body. The disease is usually chronic with cardinal features like persistent cough with or without expectoration, intermittent fever, loss of appetite, weight loss, chest pain and haemoptysis (1). TB has coevolved with humans for many thousands of years, and perhaps for several million years (2). The oldest known human remains showing signs of tuberculosis infection are 9,000 years old (3). Approximately 85% of reported TB cases were limited to the lungs. The remaining 15% involved only non-pulmonary (extra-pulmonary) or both pulmonary and non-pulmonary sites [2]. Increase in the incidence of TB in the developing countries and its re-emergence in the developed world led the World Health Organization (WHO) to declare TB as a global emergency in 1993 (3), and took a high consideration of this disease [4]. There is an increasing rate of drug resistance strains toward the drugs used for curing of TB in large sectors of risk groups. The problem of emerging multi-drug...
resistant TB (MDR-TB) is global worldwide [5], especially in crowded places, homeless, and immune compromised patients. Community-based treatment programs such as DOTS-Plus, a MDR-TB-specialized treatment using the popular Directly Observed Therapy –Short Course (DOTS) initiative, have shown considerable success in the treatment of MDR-TB in some parts of the world [6]. Tuberculosis is one of the three primary diseases of poverty along with AIDS and malaria (7). A third of the world's population is thought to be infected with M. tuberculosis, and new infections occur at a rate of about one per second (8). It is a disease of poverty affecting mostly young adults in their most productive years. The vast majority of TB deaths are in the developing world. Left untreated, each person with active TB disease will infect on average between 10 and 15 people every year and this continues the TB transmission. Overall, one-third of the world’s population is currently infected with the TB bacillus. 5-10% of people who are infected with TB bacilli (but who are not infected with HIV) become sick or infectious at some time during their life. People with HIV and TB infection are much more likely to develop TB. The risk for developing TB disease is also higher in persons with diabetes, other chronic debilitating disease leading to immune-compromise, poor living conditions, tobacco smokers etc.

Epidemiology of Tuberculosis: It is estimated that one third of the world's population (approximately 2 billion people) are infected with tubercle bacilli [7]. The global tuberculosis caseload appears to be growing slowly. Nearly two million persons die from TB each year, [8]. The distribution of tuberculosis is not uniformed across the world; about 80% of the population in many Asian and African countries test positive in tuberculin tests, while only 5–10% of the U.S.A population tests positive [9].

Tuberculosis in Iraq:

In the 1950’s tuberculosis was widespread among the Iraqi people. At the time 3400-6800 cases of pulmonary tuberculosis and 1400-3100 cases of non-pulmonary tuberculosis were recorded yearly.(10). In the course of the last decade there has been a three-time growth in the incidence of tuberculosis (from 46.1 in 1989 to 131.6 in 2000 for every hundred thousand citizens). New cases 130/100000/year, with about 273000 new case/year, among which 12600 new smear positive pulmonary tuberculosis (PTB)(11). Iraq is located eight in (EMRO) rank according to incidence in 2011, and there were an estimated 15000 incident cases of the all new and relapse cases of TB in Iraq. On other hand , the incidence of TB in Basrah had been 58.1% from 136 cases in 2001(12), 58.6% from 232 cases in 2004 [2], and 63.8% in 2007[3].

Diagnosis of Tuberculosis:

Chest X-ray: The chest X-ray examination may help to make the diagnosis in respiratory symptomatic patients that are repeatedly negative on direct microscopy sputum examination. It may also help in those individuals that cannot produce sputum for the bacteriological examination [13].

Conventional Laboratory Tests: Conventional methods of diagnosing \textit{M. tuberculosis} are slow because they rely on bacterial growth in culture and on conventional plate methods for identifying species. [14]. Acid fast bacilli (AFB) smear microscopy and culture on Löwenstein-Jensen medium are still the “gold standards” for the diagnosis of active TB, especially in low-resource countries, the only methods available for confirming TB in patients with a clinical presumption of active disease. [15].

Culture in Liquid Media:

BACTEC Systems: In resource poor countries, direct AFB microscopy and Lowenstein Jensen (L-J) media are still the main modalities used for the diagnosis/screening of tuberculosis, but these methods have low sensitivity which also depends upon the number of tubercle bacilli present in the specimen (10),
due to lack of diagnostic facilities (The broth based BACTEC 460). Other systems for culture on liquid media, developed to avoid the problem with radioactive disposal, such as MB/BacT, and Mycobacteria Growth. Indicator Tube among others [14]. Liquid culture requires only 10 – 100 bacilli per millimeter of sputum, whereas AFB microscopic detection requires 5000-10000 bacilli per Millimeter [16]. The fully automated, high capacity BACTEC MGIT 960 system is now being used as a rapid diagnostic system for tuberculosis in many developed countries. This system is easy to use, fully automated, noninvasive, non radiometric with high performance. It has an oxygen sensitive fluorescent sensor embedded in silicon base which serves as an indicator of mycobacterial growth [17].

**Aims of the study:**

1- Determine the numbers of patients in basrah city through five yrs from 2011-2015
2- Determine the differences in tuberculosis among both sexes
3- Determine the highly risk age group
4- Determine mortality rates among patients

**Materials and methods**

The records of this study was taken from infectious diseases unite in albasrah general hospital. The data collected from the files of recorded cases through 2011 to 2015

TB patients that attended to this unite which were, including pulmonary and extra pulmonary TB diseases. Their ages were between (few months-70 year). Confirmation diagnosis was depend on sputum that collected from patient according to (National Tuberculosis Program in Iraq) three samples were collected from each patient. First one was taken from patient when he just reached the center; second sample collected at early morning before breakfast; and third one was collected at any other time on the day.

**Results**

Table 1 illustrated the numbers of patients in both sexes and for various age groups who infected with tuberculosis through 2011 the total patients reached to 58 males and 27 females. The highly risk group was aged 30-39yrs for males and 60-69 yrs for females. There are statistical differences between all studied age groups P<0.05

| Age Group(yrs) | Sex | % | % improve | % dead | % |
|---------------|-----|---|-----------|--------|---|
| 1-9           | male | 0 | 0         | 3,7    | 0 | 0 | 0 | 0 | 0 |
| 10-19         | 0    | 0 | 0         | 0      | 0 | 0 | 0 | 0 | 0 |
| 20-29         | 8    | 13.8 | 6 | 22.2    | 13 | 16.9 | 1 | 12.5 |
| 30-39         | 25   | 43.1 | 0 | 0      | 24 | 31.2 | 1 | 12.5 |
| 40-49         | 10   | 17.2 | 4 | 14.8    | 13 | 16.9 | 1 | 12.5 |
| 50-59         | 4    | 6.9 | 5 | 18.5    | 8 | 10.4 | 1 | 12.5 |
| 60-69         | 5    | 8.6 | 7 | 25.9    | 10 | 13  | 2 | 25  |
| 70-79         | 5    | 8.6 | 4 | 14.8    | 8 | 10.4 | 1 | 12.5 |
| 80-90         | 1    | 1.7 | 0 | 0      | 1  | 1.3  | 0 | 0   |
| Total         | 58   | %100 | 27 | %100   | 77 | %100 | 8 | %100 |

*: P<0.05
Table 2 illustrated the numbers of patients in both sexes and for various age groups who infected with tuberculosis through 2012 the total patients reached to 52 males and 25 females. The highly risk group was aged 30-39yrs for males and females. There are statistical differences between all studied age groups P<0.05

**Table 2**: illustrated the numbers of patients in both sexes having TB during 2012

| Age Group (yrs) | Outcome | Sex % | Improve % | Total % |
|-----------------|---------|-------|-----------|---------|
| 1_9             | 1       | 1,9   | 0         | 1,4     |
| 10_19           | 1       | 1,9   | 2         | 4,1     |
| 20_29           | 5       | 9,6   | 4         | 12,3    |
| 30_39           | 23      | 44,2  | 7         | 38,4    |
| 40_49           | 10      | 19,2  | 2         | 12,4    |
| 50_59           | 6       | 11,5  | 5         | 13,7    |
| 60_69           | 5       | 9,6   | 2         | 6,9     |
| 70_79           | 1       | 1,9   | 3         | 4,1     |
| 80_90           | 0       | 0     | 0         | 0       |
| Total           | 52      | %100  | 25        | %100    | 73      | %100    | 4       | %100    |

*: P<0.05

Table 3 illustrated the numbers of patients in both sexes and for various age groups who infected with tuberculosis through 2013 the total patients reached to 21 males and 24 females. The highly risk group was aged 30-39yrs for males and 50-59 yrs for females. There are statistical differences between all studied age groups P<0.05

**Table 3**: illustrated the numbers of patients in both sexes having TB during 2013

| Age Group (yrs) | Outcome | Sex % | Improve % | Total % |
|-----------------|---------|-------|-----------|---------|
| 1_9             | 3       | 14,3  | 4         | 14,3    |
| 10_19           | 2       | 9,5   | 4         | 14,3    |
| 20_29           | 2       | 9,5   | 3         | 12,5    |
| 30_39           | 6       | 28,6  | 2         | 8       |
| 40_49           | 2       | 9,5   | 2         | 8       |
| 50_59           | 4       | 19    | 7         | 29,2    |
| 60_69           | 2       | 9,5   | 2         | 8       |
| 70_79           | 0       | 0     | 0         | 0       |
| 80_90           | 0       | 0     | 0         | 0       |
| Total           | 21      | %100  | 24        | %100    | 42      | %100    | 3       | %100    |

*: P<0.05
Table 4 illustrated the numbers of patients in both sexes and for various age groups who infected with tuberculosis through 2014. The total patients reached to 19 males and 42 females. The highly risk group was aged 60-69 yrs for males and 20-29 yrs for females. There are statistical differences between all studied age groups P<0.05.

**Table 4**: illustrated the numbers of patients in both sexes having TB during 2014

| Age Group(yrs) | male | % | Female | % | Outcome | % | dead | % |
|----------------|------|---|--------|---|---------|---|------|---|
| 1_9            | 1    | 2.4 | 0      | 0 | improve | 1 | 1.8  | 0 |
| 10_19          | 0    | 0   | 1      | 5.3| 1       | 1.8| 0    | 0 |
| 20_29          | 3    | 7.1 | 6      | 31.6| 8       | 14| 0    | 0 |
| 30_39          | 4    | 9.5 | 3      | 15.8| 6       | 10.5| 1    | 33.3|
| 40_49          | 4    | 9.5 | 2      | 10.2| 6       | 10.5| 0    | 0 |
| 50_59          | 1    | 2.4 | 3      | 15.8| 4       | 7  | 0    | 0 |
| 60_69          | 24   | 57.1| 3      | 15.8| 25      | 43.9| 2    | 66.7|
| 70_79          | 5    | 11.9| 1      | 5.3 | 6       | 10.5| 0    | 0 |
| 80_90          | 0    | 0   | 0      | 0  | 0       | 0  | 0    | 0 |
| Total          | 19   | %100| 42     | %100| 57      | %100| 3    | %100|

*: P<0.05

Table 5 illustrated the numbers of patients in both sexes and for various age groups who infected with tuberculosis through 2015. The total patients reached to 31 males and 22 females. The highly risk group was aged 30-39 yrs for males and 30-39 and 50-59 yrs for females.

There are statistical differences between all studied age groups P<0.05.

**Table 5**: illustrated the numbers of patients in both sexes having TB during 2015

| Age Group(yrs) | male | % | Female | % | Outcome | % | dead | % |
|----------------|------|---|--------|---|---------|---|------|---|
| 1_9            | 0    | 0 | 0      | 0 | 0       | 0 | 0    | 0 |
| 10_19          | 0    | 0 | 1      | 4.5| 1       | 1.9| 0    | 0 |
| 20_29          | 0    | 0 | 3      | 13.6| 3       | 5.8| 0    | 0 |
| 30_39          | 10   | 32.3| 5     | 22.7| 14      | 16.9| 1    | %100|
| 40_49          | 9    | 29 | 4      | 18.2| 13      | 25 | 0    | 0 |
| 50_59          | 7    | 22.6| 5     | 22.7| 12      | 23.1| 0    | 0 |
| 60_69          | 2    | 6.5 | 2      | 9.1 | 4       | 7.7 | 0    | 0 |
| 70_79          | 1    | 3.2 | 1      | 4.5 | 2       | 3.8 | 0    | 0 |
| 80_90          | 2    | 6.5 | 1      | 4.5 | 3       | 5.8 | 0    | 0 |
| Total          | 31   | %100| 22     | %100| 52      | %100| 1    | %100|

*: P<0.05
Discussion

The majority of TB cases were more from Baghdad city with percentage (51.47%) than other governorates at percentage (48.53%) so the high percentage of TB disease were from Baghdad may be related to the high density of population associated with crowded conditions, and because of the availability of more diagnostic methods facilities than other governorates that enable to record more TB cases among suspected TB patients, with difficulties for patients to reach Baghdad. (18,19,20,21) The high percentages of resistant cases among little of governorates such as (Basrah, Diala, Salahaldeen) may be probably, these are large cities with crowded populations than other governorates, may increased the possibility to develop TB to higher level of drug resistance. Other study idicated tuberculosis through 1990 and 2015 to halve prevalence of TB disease and deaths due to TB. With respect to the progress, as per the recent WHO estimates, in the year 1990, the prevalence rate of TB in India was 338 per 100,000 populations (best estimates) and the mortality due to TB was 42 per 100,000 populations. In comparison, in the year 2009, the prevalence of TB in India was estimated to be 249 per 100,000 populations, and the mortality due to TB is 23 per 100,000 populations [WHO Global TB Report, 2010]. (22,23,24,25,26) These estimate are derived based on mathematical and have its own inherent limitations. Government of India has undertaken nationally representative Annual Risk of TB Infection survey and TB Prevalence surveys in 7 sites of the country. The results of these surveys will be available during the mid 2011 and are expected to provide more realistic population based estimates. (3,27)

The study found that it is not the knowledge about the disease, however, the risk factors and treatment interruptions given by the patient, its social and economical impact that were associated with default.

Other study mentiones that the reason given by patient for default was The response for “TB is a incurable disease” among the TB patients were, 103(%) did not have any knowledge that TB is a curable disease. Only 54(%) had known about TB disease. The response for the “Took treatment less seriously” among the interviewed patients were 104 (66.2%) had answered yes out of which 36 (45%) patients from Puducherry answered yes and the response from Dindigul was 68 (88.3%) answered the same, the reason behind this was the respondents dint knew the severity of the disease. The response for the “Distance from DOTS centre is too much” among the TB patients were, majority of therespndents 95 (61%) answered that the Distance from DOTS centre is not too much, 62 (39%) answered yes the Distance from DOTS centre is too much. The response for the “Negative attitude of drug provider “ among the patients were 30 (19.1%) responded that There was Negative attitude of drug provider, 127 (80.9%) answered that There was no such Negative attitude by the drug provider. The response for the “Financial constrains in family” among the respondents were, 95 (61%) had responded that the TB patients had financial constrains in family, 62 (39%) responded that they never had financial constrain in family. The response for “Side effects due to TB drugs” among the TB patients were, Majority of the patients 90 (57.3%) anwered yes, Out of which 35 (43.8%) respondents from Puducherry answered yes, and 55 (71.4%) respondents from Dindigul answere the same. The response for the “To long drug regimen” among the patients, maximum patients 97 (61.8%) answered that the duration of treatment regimen was long, out of which 41 (51.3%) respondents from Puducherry answered yes and respondents from Dindigul 56 (72.7%) anwered the same, the most of the respondents were CategoryII Relapse in which they have undergone along period for treatment. (28,29,30,31,32,33,34,35) Findings of this study suggest adopting gender sensitive strategies for TB control in Puducherry and Dindigul. There is a need to improve case detection and educational programmes focussing to improve good perception and treatment outcomes among Category II TB patients. As the main problem both the public and private sector need to jointly resolve the issue, by educating and preparing the private health care providers (physicians and para medics) working at
different pharmacies, private clinics, nursing homes and medical colleges about the possibility of TB when examining the patient. High emphasis should be given to develop an effective mechanism for early diagnosis with good referral systems between the private and public providers including (medical colleges) with an inbuilt quality control mechanism. Greater partnership need to be established between the public and private sectors, and effective interventions should be adopted to reduce the risk factors for default and treatment.(36,37,38,39,40)

Conclusions and Recommendations

the conclusions based on the finding and discussions made in each important area explored in the study. Necessary recommendations have been drawn considering the urgency of the need, technical and managerial feasibility and its applicability in the present setting. The factors playing a role in default and treatment interruptions among TB patients were gender, addictions, less adequate knowledge…etc among TB patients. The study suggests that patients for TB cure have to ensure the severity of the risk factors and its impact on health · Gender-sensitive strategies need to be adopted for TB control, especially targeting on improved case-detection. · Educational programmes focusing on reducing stigma and improving good perception and correcting the wrong ones that people have learnt and retain in their mind about the disease, needs to be corrected. Majority of the patients preferred that regular home visit by health care providers during their illness, and supervised mode of treatment in both the phases can enhance TB outcome, while the proportion is of Relapse cases and Defaulters are high when compared to those of other Categories. Almost most of the respondents answered that side effects due to TB drugs and long treatment duration were also risk factors for default and treatment interruption which can be reduced by effective interventions... peoples needs to develop effective managerial mechanisms for Treatment with referral chains, and involvement of private and government health care providers, and has to implement new regimens especially for TB patients.

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