Pulmonary tuberculosis in Alzab district

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Abstract

This study in Alzab district was done to identify the new cases of pulmonary tuberculosis and their clinical, radiological and laboratory features, and try to provide a method to control the spread of this disease. It included 30 patients, 17 patients were males and 13 patients were females, the mean age of the patients was 30.2 years. The disease predominantly affected young people. Smoking has no significant correlation to pulmonary TB. The common presenting symptoms were cough, fever, sputum, weight loss and sweating with high ESR. The common radiological features were nonhomogenous opacities, cavitory lesions and pleural effusion. All patients were reviewed after 2 months and 5 months of treatment for further assessment, which revealed significant improvement of symptoms, decrease.

Introduction

Tuberculosis (TB) is one of the oldest diseases known to affected humans, is caused by bactria of mycobacterium complex, and usually affects the lungs. It is transmitted by airborne droplet nuclei from infected persons. It is usually curable if properly treated and may be fatal within 5 years in 50-60%of cases if not treated(1). TB is a global public health problem. Incidence has been rising all over the world but is worse in developing countries(2). Iraq has a high burden of TB, the estimated incidence was 99 per 100,000 in 2007(3). It is expected that TB incidence will increase year by year due to insufficient tuberculosis programs, population growth, poverty, lack of medicines and emergence of multidrug resistant TB(MDRTB)(4). MDRTB is defined as TB that is resistant at least to isoniazid and rifampicin; the two most powerful first-line anti-TB drugs(1). The treatment of TB is time consuming and expensive, and poor patient compliance is a major factor contributing to development of MDRTB and relapse(5,6), so World Health Organization (WHO) recommended directly observed therapy, short course (DOTS) as a global strategy. DOTS involves the direct observation of patients during drugs intake, which administrated three times each week, to ensure that full treatment course is followed as in Egypt, Indonesia, and India(5,7).

Materials and Methods

Study area: Alzab is a small town, and is mainly a rural area. It is located 100Km to the western of Kirkuk, it consists of the of the town and 9 villages distributed along the course of Alzab river in joining with Tigris. The area is approximately 557.5Km2 with a population about 52,000 persons (personal communication).

A cross sectional study covered patients with newly diagnosed pulmonary TB who are resident in Alzab district that attend our private clinic during the period from June 2008 to July 2009. A total number of 30 patients, were subjected to detailed history taking, clinical evaluation and number of investigations that included direct sputum smears examination for acid fast bacillus (AFB) by using Ziehl_Neelsen stain (3 samples), erythrocyte sedimentation rate (ESR), and chest X ray (CXR). The diagnosis was made according to WHO criteria: A patient was considered as pulmonary TB case if he/she has symptoms for 3 weeks or more with one of the following(2,7):

At least 2 direct smears positive sputum.

One direct smear positive sputum and positive CXR finding.

3 consecutive negative sputum smears but strong evidence of pulmonary TB by CXR and clinical features .

After establishing the diagnosis they were treated with standard antituberculus therapy for 6 months and followed for 2 and 5 months afterwards, to monitor treatment effect. During follow up various clinical and laboratory parameters were assessed for evaluation of response to therapy. The Chi square test was used to assess the associations between variables, P value of 0.05 or less was considered statistically significant.

The following definitions were obtained from WHO report to explain treatment outcome(7,12,19): a patient who completed treatment and have negative sputum smear in the last month of treatment was cured, but patient whose treatment was interrupted or stopped as soon as he feel better was defaulted. On the other hand patient still has symptoms with positive sputum smear after 5 months or more of treatment was failed to cured.

Results

The number of our patients was 30; 17 patients were males(56.7%), and 13 patients were females(43.3%). The mean age of the patients was 30.2 years, The most affected age group were from 21 to 40 years (43.4%) , (table1).

There was no statistically significant difference regarding smoking ($p>0.05$), about 63.3% of patients were non-smokers (table2).

In this study the most common symptoms at presentation were cough(96.6%), fever(93.3%), sputum(90%) weight loss (86.6%), and sweating (76.6%), (table3).

Sputum smears examination for AFB were positive in 11 patients (36.6%) at the time of presentation, but after 5 months of treatment sputum smears were positive in one patient (3.3%), there was a significant smears conversion rate overtime ($p<0.05$), (table4).

The mean ESR at the time of diagnosis was 85 mm/hour, and the mean ESR after 2 months of treatment was 25.3 mm/hr, there was significant reduction of ESR with continuation of treatment ($p<0.05$), (figure1).

The common radiological features observed were nonhomogenous opacities (43.3%), cavitory lesions (33.3%), and pleural effusion (23.3%). Other less common features include miliary shadowing and consolidation. There was no statistically significant difference regarding radiological features between sputum smears positive and sputum smears negative patients at presentation($p>0.05$), (figure2).

Family history of pulmonary tuberculosis was present in 16.6% of patients.

Revision of patients after 5months of treatments showed that 76.7% of patients were cured, 20% of patients were defaulted, and 3.3% (one patient) was failed, (figure3).

Discussion

The presented results indicate that tuberculosis affect mainly young age group and is more common in males, that lead to disability, loss of work and family poverty(8). Schwartzman et al ,showed that the mean age of his patients was 29 years and expansion of DOTS program would cost saving for patients and governments(9).

The presenting symptoms were almost similar to those reported by WHO and could be considered as a predictive signs of active pulmonary TB(7,10).

Smoking was not common finding in the present study and this did not go with Bates et al, who show that smoking is a risk factor for TB infection(11). Sputum smears for AFB were positive in 36.6% of patients. This value is below accepted WHO detection rate of 50%(12). After 5 months of follow up one patient remained positive for sputum smear and this rise the possibility of MDRTB(13,20).

On the other hand elevated ESR rise suspicion of pulmonary TB but has a low value as a diagnostic test, it can be used for monitoring of disease activity. There was a significant reduction in ESR with disease remission(10,14).

The commonest radiographic features in present study was nonhomogenous opacities involving mainly upper or middle zones of the lungs fields. Interestingly radiological findings were more common on the right lung. Other study done

by Nwonwu et al in Nigeria, showed that cavitory lesions were the commonest findings(14). Radiological features are diagnostic criterion in WHO program, and it is useful in follow up of patients and detection of complications(7,13).

Furthermore positive family history of pulmonary TB was present in 16.6% of patients. Al-Kubaisy et al, similarly showed that 17.3% infection rate among household contacts in schoolchildren in Iraq(2). This may be due to presence of extended families in Alzab district associated with crowding, poverty, malnutrition and presence of grandfathers or grandmothers who may be harboring active pulmonary TB(16,17).

The outcome of the present study showed that the cure rate was 76.6%. Niazi et al, reported cure rate as 68.6% in conventional method of delivering antituberculus drugs, but cure rate can be increased to 83.7% when applying DOTS regimen in Baghdad city(12). The WHO global target for TB treatment is an 85% cure rate, and this target has not been reached yet(18). Treatment default may be related to patient unemployment, lack of family support and motivation, comorbidity and low level of education. High default rate hide growing number of treatment failure, increase drug resistance and decrease improvement in the overall district(19). Treatment failure in present study was 3.3% which could be due to noncompliance of the patient or emergence of MDRTB. Drug resistance varies greatly between countries, e.g. in South Africa it was between 7.3% to 14.3%, but in Egypt it ranged from 0.9% to 5.1%(5). Treatment failure is a serious problem because the patients have higher mortality and remain infectious for the long period of time, hence are capable for transmitting the disease to other members in the community(20).

Finally this study recommended stronger efforts to identify patients with pulmonary TB, because delayed diagnosis and treatment might lead to presence of further new cases. Applying of DOTS program as a strategy toward increase cure rate is valuable.

References

1. Mario C, Richard JR, Brien O. Tuberculosis. In Kasper D, Fauci A, Longo D, et al. Harrison's principles of internal medicine . 16th ed. McGraw-Hill.2005, vol 2; 953-965.
2. AL-Kubaisy W, Al-Dulaymi A, Selman HD. Active tuberculosis among Iraqi schoolchildren with positive skin tests and their household contacts. Eastern mediterranean health journal 2003;9:675-688.
3. WHO. Global tuberculosis control 2009-epidemiology-strategy–financing. WHO report 2009; 6-12.
4. Seita A. Surveillance for tuberculosis in Eastern mediterranean region. Eastern mediterranean health journal 1996;2:129-134.
5. Morsy AM, Zaher HH, Hassan MH, et al. Predictors of treatment failure among tuberculosis patients under DOTS strategy in Egypt. Eastern mediterranean health journal 2003;9:689-701.
6. Hashim DS, Al-Kubaisy W, Al Dulaymi A. Knowledge, attitudes and practices survey among health care workers and tuberculosis patients in Iraq. Eastern mediterranean health journal 2003;9:718-731.
7. Khatri GR, Frieden TR. controlling tuberculosis in India. New England journal of medicine 2002;347:1420-1425.
8. Maamari F. Case-finding tuberculosis Patients: diagnostic and treatment delays and their determinants. Eastern mediterranean health journal 1996;2:129-134.
9. Schwartzman K, Oxlade O, Barr RG, et al. Domestic returns from investment in the control of tuberculosis in other countries. New England journal of medicine 2005;353:1008-1018.
10. Aziz R, Khan AR, Qayum I, et al. presentation of pulmonary tuberculosis at Ayub Teaching Hospital Abbottabad . J Ayub Med Coll Abbottabad 2002;14:6-9.

11. Bates MN, Khalakdina A, Pai M, et al. Risk of tuberculosis from exposure to tobacco smoke. Arch Intren Med 2007;167:335-342.
12. Niazi AD, Al-Delaimi AM. Impact of community participation on treatment outcomes and compliance of DOTS patients in Iraq. Eastern mediterranean health journal 2003;9:709-716.
13. Allos BM, Gnsheimer KF, Bloch AB, et al. Management of an outbreak of tuberculosis in small community. Ann Intren Med 1996;125:114-117.
14. Saluja JG, Ajnky A, Khemani B. comparative study of sensitivity of diagnostic test for tuberculosis in children. Bombay hospital journal 2002;44:164-177.
15. Nwonwn EU, Oyibo PG, Imo AO, et al. Radiological features of pulmonary tuberculosis in HIV-positive and HIV-negative adult patients in southeastern Nigeria. African journal of respiratory medicine 2008;3:20-23.
16. Bashour H, Mamaree F. Gender differences and tuberculosis in Syria Arab Republic: patients attitudes, compliance and outcomes. Eastern mediterranean health journal 2003;9:757-768.
17. Gad A, Mandil AM, Sherif AA, et al. Compliance with antituberculus drugs among tuberculosis patients in Alexandria,Egypt. Eastern mediterranean health journal 1997;3:244-250.
18. Dye Ch, Scheels S, Dolin P, et al. Global burden of tuberculosis: Estimated incidence, prevalence and mortality by country. JAMA 1999;282:677-685.
19. Jakubwiak WM, Bogorodskaya EM, Borisov ES, et al. Risk factors associated with default among new pulmonary TB patients and social support in six Russian regions. Int j tuberc lung dis 2007;1:46-53.
20. Tahaogl KU, Torun T, Sevin T, et al. The treatment of multidrug-resistant tuberculosis in Turkey. New England journal of medicine 2001;345:170-174.

Table(1) The age of Patients with Pulmonary TB according to sex

Total	Female	Male	Sex Age
10(33.3%)	5(38.5%)	5(29.4%)	8-20
13(43.4%)	6(46.2%)	7(41.2%)	21-40
7(23.3%)	2(15.3%)	5(29.4%)	41-60
30(100%)	13(100%)	17(100%)	Total

Table(2) Smoking in relation to sex in patients with pulmonary TB

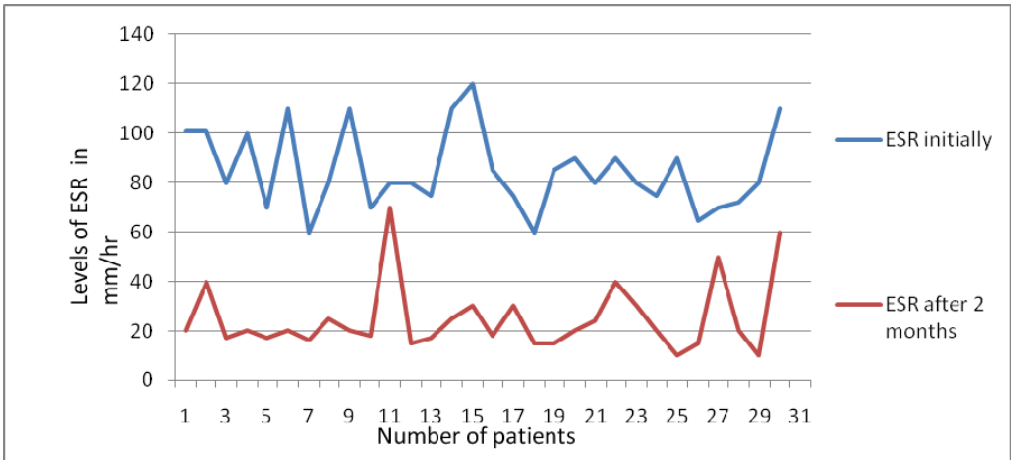
Total	Female	Male	Sex Smoking
11(36.6%)	2(15.3%)	9(52.9%)	Smokers
19(63.4%)	11(84.7%)	8(47.1%)	Non smokers
30(100%)	13(100%)	17(100%)	Total

Table(3) Symptoms of pulmonary TB (n:30)

Symptoms	Frequency
Cough	29 (96.6%)
Fever	28 (93.3%)
Sputum	27 (90%)
Weight loss	26 (86.6%)
Sweating	23 (76.6%)
Anorexia	18 (60%)
Hemoptysis	10 (33.3%)
Dyspnea	9 (30%)
Pleuritic chest pain	5 (16.6%)

Table(4) Sputum smears results in relation to the duration of treatment in patients with pulmonary TB

5 months later	At diagnosis	Sputum Examination
1(3.3%)	11(36.6%)	Smears Positive
29(96.7%)	19(63.4%)	Smears Negative
30(100%)	30(100%)	Total



Figure(1) Values of initial ESR & after 2 months of treatment in patients with pulmonary TB