
Nutritional and Epidemiological Characteristics of Iraqi TB Patients

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Abstract:

Introduction: There is good evidence, both at the population and the clinical level, for the effect of primary malnutrition on tuberculosis, both to increase frequency of occurrence and to exacerbate clinical manifestations.

Objectives: To study the nutritional and socio-epidemiological characteristics that may affect the Iraqi TB patients.

Patients And Method: Prospective observational designed study for one year were conducted in Al-Rasheed Teaching Military Hospital / Department of Medicine – TB and pulmonology clinic. A 206 patients of pulmonary TB visiting the clinic monthly were included in the study. At the interview patients asked about medical history (including the social habits, smoking, family history of TB and history of prison); examined physically and assessed nutritionally (BMI, triceps Skin fold thickness and waist to hip ratio) then send for laboratory investigation (Hb%, sputum for AFB, liver function test) at each monthly visit.

Results: mean age of patients were 26.12 ± 6.46 years and BMI 20.09 ± 3.37 kg/m²; while the prevalence of malnutrition (BMI <18.5 kg/m²) was 23.52% of studied patients. Mean duration of complaint 37.82 ± 26.91 days before seeking medical consultation. Prisoners form 61.28% of all patients. Prevalence of smoking was 61.76% among studied patients. Prevalence of previous TB history was 19.60% of patients. Prevalence of positive TB family history was 7.38% of patients.

Conclusions: Nutritional status, Prison, smoking, previous TB history and family history of TB were possible TB risk factors which compound the nutritional effects on TB patients.

Key Words: Pulmonary Tuberculosis, Malnutrition, Body mass index,

Introduction

Tuberculosis (TB) has been one of the most important illnesses in the history of the world.^[1] TB today remains one of the world's most lethal infectious diseases. An estimated one-third of the world's population is infected with the tubercle bacillus- *Mycobacterium tuberculosis* (Mtb), and 7 to 8 million people develop TB disease each year.^[2] Interestingly, eighty percent of the tuberculosis cases were pulmonary tuberculosis.^[3]

Malnutrition is observed frequently in patients with pulmonary TB, but their nutritional status, especially of micronutrients, is still poorly documented.^[4] Most patients who contract TB had poor nutritional status and lived in crowded environments. They faced joblessness and negative attitudes from their neighbors and relatives.^[5] There is good evidence, both at the population and the clinical level, for the effect of primary malnutrition on tuberculosis, both to increase frequency of occurrence and to exacerbate clinical manifestations.^[6] It is quite clear and important aspect of the bi-directional relationship between TB and malnutrition.^[6]

Recognizing that TB has been one of the most neglected international health problems and TB epidemic is out of control in many parts of the world, so that the World Health Organization (WHO) declared the TB to be a global health emergency in 1993. Despite the steady decline in TB cases since that time, TB remains a clinical and epidemiological international challenge for the world's health.^[2]

It is worldwide appreciated that TB is not only increasing globally but, it is expected to do so

within the next decade for three principal reasons. *First*, demographically as the expected population increase will be greatest in areas of the world where TB is most prevalent, particularly middle Africa and South Asia. *Secondly*, the increase of HIV, which renders the host uniquely susceptible to TB, is occurring in the same areas of the world and is already causing an increase in tuberculosis case rates of up to tenfold. *Thirdly*, as more and more people are forced to live in poverty, where poor nutrition and crowded conditions lead to the spread of TB, the disease risk will be compounded.^[7]

Objectives

To study the nutritional and socio-epidemiological characteristics that may affect the Iraqi TB patients.

Patients & method

Prospective observational designed study for the period Jan 1st to Dec 31st 2002 were conducted in Al-Rasheed Teaching Military Hospital / Department of Medicine – TB and pulmonology clinic. A 206 patients of pulmonary TB visiting the clinic monthly were included in the study, each patient was interviewed separately every visit. At the interview patients asked about medical history (including the social habits, smoking, family history of TB and history of prison); examined physically and assessed nutritionally (BMI, Skin fold thickness at mid-arm over the triceps and waist to hip ratio) then send for laboratory investigation (Hb%, sputum for AFB, liver function test). Patients participated in the study were all males attributed from the middle Iraqi zone governorates, serving in

army as permanent or obligatory temporary service and working in different occupations and skills, out the army, in addition to the military service.

Agreements and ethical regulations were regarded during the study according to the medical research roles, protocols and recommendations, thus an oral consent was taken from all enrolled patients.

All the statistical work and regestration of obtained data were carried out by using Microsoft Excel - Windows XP professional program. t-test and chi-test were used to test the differences between results at the level of significance when $P < 0.05$ and 0.01 .

Results

A total of 206 Iraqi military TB patients had been submitted one year study successfully without problems. Their mean±SD age found to be 26.12 ± 6.46 years and BMI 20.09 ± 3.37 kg/m²; while the prevalence of malnutrition (under weight), BMI < 18.5 kg/m² [8], was 74 patients (23.52%) of studied patients.

The patients' interviews showed that main complaint of patients were fever and sweating 201 patients (98.5%), cough 197 patients (97.5%) and haemoptesis 57 patients (25%); with mean±SD duration of complaint was a 37.82 ± 26.91 day before seeking medical consultation.

Nutritional parameters used for assessment of patients nutritional status were hemoglobin concentration (Hb%), Body Mass Index (BMI), triceps Skin Fold Thickness (SFT) and Waist to Hip ratio (W/H ratio). Comparison of parameters at the time of diagnosis and at the last visit of follow up and treatment (table-1) showed statistically significant gaining in the BMI while the other parameters were insensitive for the changes of the patient's nutritional status during and after treatment.

Prisoners form 127 patients (61.28%) of all patients; the mean duration of imprison was 17.45 ± 11.2 months. Comparison of nutritional status of prisoners vs. non imprisoned patients (table - 2) showed high statistical significant difference (Chi-square test, P-value < 0.01).

Table – 1: Nutritional parameters of TB patients before and after treatment.

	First visit (mean±SD)	Last visit (mean±SD)
Hb (g/dl)	12.58±1.49	12.47±1.39
BMI (kg/m ²) *	20.24±3.72	20.58±3.84
SFT (mm)	7.33±6.73	7.25±4.73
W/H ratio	0.886±0.71	0.829±0.06

* t-test, P-value < 0.05

Table – 2: Comparison of nutritional status of prisoners vs. non-imprisoned patients.

	Malnourished patients (BMI < 18.5 kg/m ²) (n=73)		Nourished patients (BMI > 18.5 kg/m ²) (n=93)		Total (n=166)	
	(n)	%	(n)	%	(n)	%
Prisoners	41	38.71	55	61.29	96	100
Non- Prisoners	32	45.71	38	54.29	70	100
Chi-square test, P-value < 0.01						

Prevalence of smoking was 130 patients (61.76%) of studied patients. Comparison of nutritional status of smokers vs. non smokers (table – 3) showed high statistical significant differences (P-value < 0.01).

Prevalence of previous history of pulmonary TB infection was 40 patients (19.60%) of studied patients. Comparison of nutritional status of patients who had TB previously vs. patients

without history of TB (table – 4) showed high statistical significant differences (P-value < 0.01).

Prevalence of positive TB family history was 17 patients (7.38%) of studied patients. Comparison of nutritional status for those who had TB family history vs. patients without family history of pulmonary TB (table – 5) showed high statistical significant difference (P-value < 0.01).

Table – 3: Comparison of nutritional status for the smokers vs. non smokers.

	Malnourished patients (BMI<18.5 kg/m ²) (n=71)		Nourished patients (BMI>18.5 kg/m ²) (n=108)		Total (n=179)	
	(n)	%	(n)	%	(n)	%
Smokers	39	35.77	70	64.23	109	100
Non-Smokers	32	45.71	38	54.29	70	100

Chi-square test, P-value <0.01

Table – 4: Nutritional status of patients with positive TB history vs. patients with negative TB history.

	Malnourished patients (BMI<18.5 kg/m ²) (n=74)		Nourished patients (BMI>18.5 kg/m ²) (n=112)		Total (n=186)	
	(n)	%	(n)	%	(n)	%
patients with positive TB history	14	36.84	24	63.16	38	100
patients with negative TB history	60	40.54	88	59.46	148	100

Chi-square test, P-value <0.01

Table – 5: Comparison of nutritional status of patients with positive TB family history vs. patients with negative TB family history.

	Malnourished patients (BMI<18.5 kg/m ²) (n=74)		Nourished patients (BMI>18.5 kg/m ²) (n=112)		Total (n=186)	
	(n)	%	(n)	%	(n)	%
patients with positive TB family history	6	38.67	8	61.33	14	100
patients with negative TB family history	68	39.53	104	60.47	172	100

Chi-square test, P-value <0.01

Discussion

Tuberculosis has a dramatic effect on nutritional state or it may be the outcome of malnutrition and this has been borne out in all the studies that have investigated body composition in affected patients.^[6] Though the mean BMI of studied patients were 20.09 ± 3.37 kg/m² which was accepted as nourished patients; but 74 patients (23.52%) of studied patients were malnourished (BMI <18.5 kg/m²). Similarly, Karyadi et.al., Indonesia, 2000, proved that TB patients had significantly lower BMI, skin fold thickness, mid-upper arm circumference.^[5] Also, Nunez-Rocha et.al., Mexico, 2000, found that the mean BMI was 19.8 ± 3.2 kg/m² and 57% of patients presented malnutrition.^[9]

Present study showed that mean of duration before diagnosis and treatment was 37.8 ± 26.9 days which is important for the severity and prognosis of the disease; this duration was considered short when compared with Sasaki et.al., Japan, 2002, who found that patient's delay was 5.5 ± 5.0 months, the major cause of late detection was patient's delay which caused poor prognosis.^[10]

Nutritional status should be assessed and nutritional intervention should be provided in an attempt to improve the prognosis of TB patients.^[11] There was a significant improvement in the mean BMI of patients between first and last visit (t-test, P-value <0.05). Paton et.al., Singapore, 2004, cited that nutritional support is often recommended as part of the treatment of TB and early intervention to increase nutritional intake, increase lean mass and physical function.^[12] Chang et.al., Taiwan, 2002, noticed that tuberculosis in prison was a serious public health problem that is fueled by overcrowding, poor nutrition and unsatisfactory medical service.^[13] Present study proved that nutritional status and TB infection was public health problem compounded in prisons. Present study shows high statistically significant

differences between nutritional status of prisoners TB patients and patients who were not imprisoned.

The possible risk factors for development of TB were overcrowding, under-nutrition, previous cases of TB in the family, concurrent Diabetes mellitus, poor personal hygiene, smoking, and alcohol abuse.^[5] The present study demonstrate the relationships between TB and those possible risk factors; these relations were tested statistically and shown high significant differences between the presence and absence of these risk factors. TB patients have not only medical but also social problems related to their illness, which may influence their course of disease and motivation for the completion of treatment.^[5]

Conclusions

Nutritional status of patients was an important factor for the TB predisposition and improvement. Prison, smoking, previous TB history and family history of TB were possible TB risk factors which compound the nutritional effects on TB patients.

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