Egyptian Journal of Chest Diseases and Tuberculosis (2015) 64, 85–89

HOSTED BY

The Egyptian Society of Chest Diseases and Tuberculosis

Egyptian Journal of Chest Diseases and Tuberculosis

www.elsevier.com/locate/ejcdt
www.sciencedirect.com

ORIGINAL ARTICLE

Pattern of tuberculosis in patients of a university hospital during the period (2004–2011)

Moustafa Zedan [a], Esmail Al Wakeel [a], Ahmed T. Shaarawy [a,*], Mohammed Nour [b]

[a] Al-Azhar University, Cairo, Egypt
[b] Al-Azhar University, Damietta, Egypt

Received 3 January 2014; accepted 4 September 2014
Available online 26 September 2014

KEYWORDS

Tuberculosis;
Pattern;
University hospital

Abstract *Aim of the work:* To identify the pattern of infection among diagnosed patients with tuberculosis presented to chest diseases clinic and/or admitted to the department of chest diseases in Bab El Shaaria (Al-Azhar) University hospital.

Subjects and methods: By retrospective analysis of available data, all patients who were diagnosed and registered in the period from January 2004 till December 2011 in the follow up records in TB clinic and in the chest diseases department in Bab El Shaaria University hospital were included. Data were collected from the patient files. These data included: full history, chest X-ray, sputum examination results, and all other data related to the patient's condition.

Results: A total of 384 patients were registered in TB clinic in Bab El Shaaria University hospital with a diagnosis of tuberculosis (pulmonary or extra-pulmonary). Their age ranged from 3 to 80 years, with mean age of 37.5 + 16.0 years. As regards gender there were 178 male patients (46.4%), and 206 female patients (53.6%). As regards site affected there were 209 patients (54.4%) with pulmonary TB and 175 patients (45.6%) with extrapulmonary TB. The percentage of TB cases to the total number of chest clinic visitors per year was ranging between 0.08% and 0.8% with an average of 0.48%, while the percentage of pulmonary TB cases to the total number of TB cases per year was ranging between 27% and 65% of total TB cases per year with an average of 51.7%.

Introduction

Tuberculosis (TB) is a problem of global importance, it is a medical, social and economic disaster of immense magnitude that is occurring over the world [1,2].

* Corresponding author.

Peer review under responsibility of The Egyptian Society of Chest Diseases and Tuberculosis.

http://dx.doi.org/10.1016/j.ejcdt.2014.09.003

Despite being a potentially curable disease, tuberculosis is the second leading infectious cause of death worldwide (after AIDS), killing around 2 million people per year [3].

Tuberculosis can attack people of any sex, age, or socioeconomic class. In reality, TB is likely to claim its greatest toll from certain strata of the population, and it is important to identify these for the purpose of planning and implementing TB control [4].

In 2005, WHO estimated that one third of the world's population is currently infected with the tubercle bacilli, and more than eight million people get TB every year, of whom 95% live in developing countries. An estimated two million people die from TB every year [5].

The quality of epidemiological evaluation rests on the methods used to collect and analyze TB data. The number of new TB cases arising per capita each year (incidence) is the central measure of progress toward elimination, which is the principal long-term goal of TB control [6].

The incidence or annual risk of TB infection (ARTI) indicates the proportion of the uninfected population who will become primarily infected with tubercle bacilli during the course of a year. The ARTI is probably greatest in sub-Saharan Africa (1.5–2.5%), followed closely by South and East Asia (1–2%). In North Africa, the Middle East and Latin America the estimated ARTI ranges between 0.5% and 1.5%. The estimated global average risk of infection is 1%, implying approximately 38 million new infections per year among the previously uninfected population [7].

Aim of the work

To identify the pattern of TB among diagnosed patients with tuberculosis presented to chest diseases clinic and admitted to the chest diseases department in Bab El Shaaria University hospital.

Design

Retrospective analysis of records of patients with tuberculosis.

Subjects and methods

The files of all patients diagnosed and registered as tuberculosis in the period from January 2004 to December 2011 in the follow up sheets in TB clinic and in the chest diseases department in Bab El Shaaria University hospital were included. A total of 384 patients were diagnosed as tuberculosis (pulmonary or extrapulmonary) by microbiological, histopathological or clinical findings.

Methods

Retrospective analysis of patient's records, by collecting data from all available patient files. These data included; full history, tuberculin skin test result, chest X-ray, sputum examination, and any other data relevant to the patient's condition.

Results

This study included 384 patients and age of patients ranged from 3 to 80 years, and patients were classified into four groups according to age, percentage of TB cases in age group ⩽ 15 years it was 3.6%, in age group 16–39 years it was 53.2%, in age group 40–59 years it was 32% and in age group ⩾ 60 years it was 11.2% (see Table 1).

As regards gender there were 178 (46.4%) males and 206 (53.6%) females (see Table 2).

As regards the classification of cases there were 366 (95.3%) new cases, 16 (4.2%) relapsed cases and 2 (0.5%) defaulter cases (see Table 3).

The pulmonary TB cases were 209 (54.4%) and extra-pulmonary TB cases were 175 (45.6%) (see Table 4).

As regards sputum examination for acid fast bacilli result, 62.2% of cases had positive sputum and 37.8% of cases had negative sputum (see Table 5).

The presenting symptoms among patients were fever and sweating in 34.9%, weight loss in 29%, cough in 40.6%, hemoptysis in 14.8% and chest pain in 2.3% of cases (see Table 6).

Right side was affected on chest X-ray (CXR) in 48.4% of cases, left side in 18.4% and bilateral affection was evident in 0.7% of cases (Table 7).

Tuberculosis mainly affected upper lung zone in 54.5% of cases, middle lung zone in 18.5% and lower lung zone in 26.2% of cases (Table 8).

Radiological findings on CXR were consolidation (18.2%), fibroproliferative densities (24%), segmental or lobar atelectasis (10.6%), cavitation (2.3%), miliary shadows (0.5%), effusion (15.3), hilar lymphadenopathy (0.7%), and normal (32.9%) (Table 9).

The percentage of TB cases to the total number of chest clinic visitors per year was as follows: in 2004 it was 0.72%, in 2005 it was 0.86%, in 2006 it was 0.52%, in 2007 it was 0.55%, in 2008 it was 0.56%, in 2009 it was 0.37%, in 2010 it was 0.2% and in 2011 it was 0.08% (see Table 10).

The percentage of pulmonary TB cases to the total number of TB cases per year was as follows: in 2004 it was 53%, in 2005 it was 59%, in 2006 it was 50%, in 2007 it was 53.7%, in 2008 it was 44.6%, in 2009 it was 65.8%, in 2010 it was 52%, and in 2011 it was 27.8 % (Table 11).

As regards extra-pulmonary sites, TB cervical lymphadenopathy, and TB pleurisy affected more than two thirds of cases (see Table 12).

Discussion

This study was done in the period from January 2012 to December 2012 to identify retrospectively the pattern of TB infection among diagnosed patients with tuberculosis presented to chest diseases clinic and admitted to the chest diseases department in Bab El Shaaria University hospital in

Table 1 Age distribution among TB cases.

Variable	Range	Mean + SD
Age (years)	3–80 y	37.5 + 16.0
Age groups	Number of patients	%
⩽ 15 years	14	3.6
16–39 years	204	53.2
40–59 years	123	32
⩾ 60 years	43	11. 2
Total	384	100

Table 2 Gender distribution among TB cases.

Gender	Number (N)	%
Male	178	46.4
Female	206	53.6
Total	384	100

Table 3 Classification of TB cases.

Cases	N	%
New	366	95.3
Relapse	16	4.2
Defaulter	2	0.5
Total	384	100

Table 4 Total number of pulmonary and extra- pulmonary TB cases.

Variable	N	%
Pulmonary TB	209	54.4
Extra-pulmonary TB	175	45.6
Total	384	100

Table 5 Result of sputum test for acid fast bacilli (AFB) among pulmonary TB cases.

Sputum test (AFB)	N	%
Positive	130	62.2
Negative	79	37.8
Total	209	100

Table 6 Presenting symptoms among pulmonary TB cases.

Symptom	N	%
Fever and sweating	73	34.9
Weight loss	61	29
Cough	85	40. 6
Hemoptysis	31	14. 8
Chest pain	5	2.3
Total	209	100

Table 7 Side affected on CXR in total cases of tuberculosis.

Side of lesion	N	%
Rt	186	48.4
Lt	71	18.4
Bilateral	3	0.7
Normal	124	32.9
Total	384	100

Table 8 Affected zone on chest X-ray.

Affected zone on chest X-ray	N	%
Upper zone	141	54.5
Mid lung zone	48	18.5
Lower zone	68	26.2
Diffuse	2	0.8
Total	260	100

Table 9 Chest X-ray (CXR) findings among TB cases.

CXR findings	N	%
Consolidation	71	17.6
Fibro proliferative densities	95	23.6
Segmental or lobar atelectasis	41	10.2
Cavitation	9	2.2
Milliary	2	0.5
Effusion	58	14.4
Hilar lymphadenopathy	3	0.7
Normal	124	30.8
Total findings	403	100

8 year period. Bab El Shaaria University hospital is serving a large number of socioeconomically disadvantaged populations mostly urban but there are some rural populations served, as it is a tertiary referral hospital. This study was done by retrospective analysis of data registered in chest diseases clinic in Bab El Shaaria University hospital in the period from 2004 to 2011. In this study we found that 384 patients were diagnosed as tuberculosis and received antituberculous therapy out of 83,398 outpatient attendants constituting about 0.46%. The age of patients ranged from 3 to 80 years, and more than 85% of patients were between 16 and 60 years and less than 15% were at extremes of age. This is in agreement with Kochi 2001 who reported that more than 75% of infected persons were below the age of 50 in developing countries [8].

And it is in agreement with Mori and Leung, 2010 who stated that, in Africa the age group of 15–44 years comprises about 74% of the population, whereas in the United States it is only 24%, so in high-prevalence settings, TB is affecting the most productive age groups which necessitates more attention in TB control programs targeting those age groups [4].

In this study there were 178 males (46.4%), and 206 females (53.6%) (Table 2).

This in agreement with results found by Abdel Hameed et al. (1992) in a study done over four governorates (Cairo, Port Said, Zagazig and Damietta) studying circumstantial evidences and predisposing factors of pulmonary tuberculosis and they reported that 83% of cases were males and 17% were females [9].

As regards the proportion of extrapulmonary to pulmonary TB cases in this study it was near 1 to 1 as pulmonary TB cases were 209 patients (54.4%) while extrapulmonary TB cases were 175 patients (45.6%) (Table 3).

This result is in agreement with results reported by Froude and Kingston, 1982 who reviewed 162 cases diagnosed with extrapulmonary TB between 1979 and 1981 from the King Faisal Specialist Hospital and Research Center (KFSHRC), KSA and the ratio of pulmonary to extrapulmonary TB was 1:1 during a 27 month period [10].

In the present study positive sputum test among pulmonary tuberculous patients was 62.2% (Table 5).

This in agreement with Al Maraghy et al. (1993) who showed that out of 1471 suspected pulmonary tuberculous

Table 10 Number and percentage of TB cases in eight year period in relation to total chest clinic visitors.

Year	Total Number of TB Cases	Total number of chest clinic visitors	%
2004	68	9354	0.72
2005	79	9112	0.86
2006	50	9594	0.52
2007	54	9795	0.55
2008	56	9852	0.560
2009	41	10942	0.37
2010	25	11986	0.20
2011	11	12763	0.08
Total	384	83398	0.46

Table 11 Number and percentage of Pulmonary and Extra-pulmonary TB cases in eight year period.

Year	Total TB cases/year	Pulmonary		Extra-pulmonary	
		N	%	N	%
2004	68	36	53	32	47
2005	79	47	59.5	32	40.5
2006	50	25	50	25	50
2007	54	29	53.7	25	46.3
2008	56	29	51.8	27	48.2
2009	41	27	65.8	14	34.1
2010	25	13	52	12	48
2011	11	3	27.8	8	72.2
Total	384	209	54.5	175	45.5

Table 12 Distribution of Extra-pulmonary cases.

Extra-pulmonary TB site	N	%
TB cervical	59	33.7
TB pleurisy	58	33.1
TB spine (pott's disease)	15	8.5
TB peritonitis	9	5.1
TB cold abscess	4	2.2
TB urinary	4	2.2
TB salpingitis	4	2.2
TB endometritis	4	2.2
TB enteritis	3	1.7
TB mediastinal LN	3	1.7
TB arthritis	4	2,2
Miliary TB	2	1.1
TB brain abscess	2	1.1
TB axillary LN	1	0.5
TB cervical cold abscess	1	0.5
TB (bone) osteomyelitis, metacarpal bone	2	1.1
Total	175	100

cases there were 395 cases (26.85%) confirmed pulmonary tuberculosis by positive direct smear [11].

As regards the type of cases in our study there were 366 new cases of TB patients accounting for 95.3%, while relapses were 16 patients accounting for 4.2% and defaulters 2 patients accounting for 0.5%. This is in agreement with Small et al., 1994 who found that 93.2% (441 of 473) had no prior diagnosis of TB while 6.8% (32 cases of 473) had prior diagnosis of TB (relapses or defaulters) [12].

As regards the presenting symptoms of pulmonary TB cases in this study, cough was the presenting symptom in 40.6%, fever and sweating in 34.9%, weight loss in 29%, hemoptysis in 14. 8% and chest pain in only 2.3%, this is in agreement with results reported by Kreider and Rossman (2008) who stated that the most frequently reported symptoms of active pulmonary tuberculosis included cough (23–47%), fever (18–79%), weight loss (7–24%), and hemoptysis (8–9%) [13].

Radiologic manifestations of pulmonary TB are dependent on several host factors, including prior exposure to TB, age, and underlying immune status. In this study the radiological findings of pulmonary TB cases included: infiltration in 186 patients (71.5%), cavitary lesions in 9 patients (3.5%), effusions in 59 patients (22.7%) and opacity in 4 patients (1.5%). And the lesions were present in the right side in 51% of cases, left side in 19.8% and bilateral in 0.8%, while X-ray was normal in 28.4% of cases. The lesions were in upper zone in 39.1% of cases, mid-lung zone in 13.3%, and lower zone in 18.8%. These results are in agreement with the results reported by Gutirrez et al. (1991), who compared radiologic findings between 49 HIV seropositive patients and those with no known risk factors for HIV and they reported that in 117 patients with pulmonary TB having no known risk factors for HIV CXR showed upper zone infiltration in about 70% of cases, lower zone in 7%, cavitation in 60%, milliary in 0.8%, pleural involvement in 22% while CXR was normal in 0% of cases [14].

And this in agreement with Woodring et al. (1986), who found that pulmonary tuberculosis produces a broad spectrum of radiographic abnormalities [15].

Conclusion

This study was aiming to study the pattern of pulmonary tuberculosis in patient's followed up at Bab El Shaaria university hospital either as outpatient or admitted at the chest department with the diagnosis of TB. It included 384 patients, 206 females (53.6%), and 178 males (46.4%), 366 new cases, 16 relapses and 2 defaulters, 209 (54.4%) pulmonary TB cases {(130 (62.2%) sputum smear positive and 79 (37.8%) sputum smear negative)}, and 175 (45.6%) with extra-pulmonary TB. The percentage of TB cases to the total number of chest clinic visitors per year was ranging between 0.08% and 0.8% with an average of 0.48%, while the percentage of pulmonary TB cases to the total number of TB cases per year was ranging between 27% and 65% of total TB cases per year with an average of 51.7%.

Recommendations

1. More efforts should be exerted to increase our knowledge about epidemiological determinants of TB in our community and to use this knowledge in proper planning of control programs as any effective TB elimination effort should address the socioeconomic determinants of the disease.
2. All data about patients admitted to chest departments and following up in chest clinics should be registered in an accurate manner using uniform sheets that all researchers can refer to when doing statistical studies on tuberculous cases.
3. Bacteriological investigations regarding TB assessment should be available in all university hospital laboratories with proper recording of these results in a uniform file formats.
4. Regular follow up of patients to detect early complications of treatment and to detect relapse, defaulters and treatment failure.

Conflict of interest

None declared.

References

[1] T.R. Frieden, T.R. Sterling, S.S. Munsiff, C.J. Watt, C. Dye, Tuberculosis, Lancet 362 (2003) 887–899.
[2] World Health Organization. Tuberculosis: the global burden; global TB fact sheet. http://www.who.int/tb/publications/tb. 2005.
[3] Chapman, Stephen; Robinson, Grace; Stradling, John; West, Sophie. In: Oxford Handbook of Respiratory Medicine, 1st Edition 2005 Oxford University Press.
[4] Mori T, and Leung C. C.: Tuberculosis in the Global Aging Population Infect Dis Clin N Am 2010; 24,751–768.
[5] World Health Organisation. WHO Library Cataloguing-in-Publication Data. Global tuberculosis report 2013. ISBN 978 92 4 156465 6.
[6] Raviglione M.C.; Tuberculosis: the essentials. 4th ed. (Lung biology in health and disease; 237).
[7] Tuberculosis hand book, World Health Organization 1998, Writing committee: Antonio pio, Pierre Re Chaulet, Global Tuberculosis Programme, World Health Organization, Geneva, Switzerland.
[8] A. Kochi, The global tuberculosis situation and the new control strategy of the World Health Organisation, Bull. World Health Organ.Tubercle. 79 (2001) 1–6.
[9] Abdel Hameed H.A., Abd El Hakim M Sharaf Elddin M. and Nagy E.: Circumstantial evidences and predisposing factors of pulmonary tuberculosis. Egypt. J Chest Dis. And Tub. 1992;40, 2,77–89.
[10] J.R. Froude, M. Kingston, Extrapulmonary tuberculosis in Saudi Arabia, a review of 162 cases, King Faisal Specialist Hospital Medical J. 2 (1982) 85–95.
[11] Al Maraghy A., Esmat M. M., El Samadony M. F., Al Asmar A. B., Radwan I., Awad T.A. and El Shafey A.M.: the pattern of pulmonary tuberculosis during the period of 1981–1985 in Al Mahalla Alkubra chest dispensary. Egypt. J Chest Dis. And Tub. 1993;41: (1) 12–24.
[12] Small P.MA., Hopewell P.C., Singh S.P., Paz A., Parsonnet J., Ruston D.C., Schecter G.F., Daley C.L., and Schoolnik G.K.: The epidemiology of tuberculosis in San Francisco, a population based study using conventional and molecular methods. The New England journal of medicine 1994,330;24:1703–9.
[13] Kreider M. E. and Rossman M.D.: Clinical presentation and treatment of tuberculosis in Fishman pulmonary diseases and disorders. Fourth Edition 2008. chapter 140,2467–2485.
[14] J. Gutirrez, R. Miralles, J. Coll, C. Alvarez, M. Sanz, J. Rubih-Prat, Radiographic findings in pulmonary tuberculosis: the influence of human immunodeficiency virus infection, Eur. J. Radiol. 12 (1991) 231–234.
[15] J.H. Woodring, H.M. Vandiviere, A.M. Fried, M.L. Dillon, T.D. Williams, I.G.P. Melvin, Update: the radiographic features of pulmonary tuberculosis, Am. J. Roentgenol. 146 (1986) 497–506.