

Epidemiological study of Tuberculosis in Fayoum governorate in the Period from 2013 to 2017

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Abstract

The aim of the study is to assess the epidemiology of TB either pulmonary or extra-pulmonary in Fayoum governorate in the period from 2013 to 2017.

Patients and methods:

This is a retrospective study which was conducted at hospitals of ministry of health at Fayoum governorate and included 912 patients who were infected with TB and received anti-TB treatment in the period from 2013 to 2017.

Results:

The total number of patients included in

the study was 921. The mean age of study group was (38.8± 17.6) years old, 63.4% of them were males while 36.6% were females. 63.8% of cases suffer from pulmonary TB, while 36.2% were affected by extra-pulmonary TB. Pleural effusion represents the higher percentage in extra pulmonary cases.

Conclusion: Fayoum has a high percentage of patients registered as having TB, for whom treatment outcomes are satisfactory

Keywords: Tuberculosis ,Fayoum, Epidemiology.

Introduction:

The World Health Organization (WHO) estimates that approximately one-third of the world population is infected with *Mycobacterium tuberculosis* (Mtb), the agent that causes Mtb infection and disease, and annually eight million individuals develop TB disease, accounting for at least two million deaths (1). Globally, the current decline in TB incidence is rather slow at approximately 1,5% per year to reach the TB pre-elimination phase by 2035 (2).

In order to eliminate TB, the World Health Organization (WHO) established the End TB Strategy, which outlined targets of 90% reduction in TB incidence and 95% reduction in TB deaths by 2035 (3).

Enhanced efforts and integrated strategies are much needed, especially for vulnerable and high- risk population for TB .The key challenges in the development of new treatments for TB are the needs for novel drug combinations, new trial designs, studies in pediatric populations, increased clinical trial capacity, clear regulatory guidelines, and biomarkers for prediction of long-term outcome (3). This study is performed to assess the epidemiology of TB

either pulmonary or extra-pulmonary in Fayoum governorate in the period from 2013 to 2017.

Subject and methods:

The registered data about all TB cases over a period of 5 years (2013–2017) were collected from the TB registration files recorded in the hospitals of ministry of health in Fayoum governorate which include: Fayoum chest hospital, Central Etsa hospital, Central Abshaway hospital, Central Senores hospital, Central Tamaya hospital, Health insurance organizes (HIO) and Prison hospital.

The Collected data included:

- (1) The year in which the patient received anti-TB treatment.
- (2) Socio demographic data which included name, age, sex and residence.
- (3) Forms of tuberculosis; Either: Pulmonary (either smear positive or smear negative) or extra pulmonary (and its site as LN, intestine, meninges, breast, renal) and the methods of diagnosis.

- (4) History of previous treatment if present (category of patients or type of the patient); either new, relapse, treatment after failure, treatment after lost to follow, or others.
- (5) Schedule of treatment according to recommended standardized treatment regimen.
- (6) The recorded follow up for smear-positive pulmonary tuberculosis included sputum smear microscopic examination for acid fast bacilli, at the end of 2nd month, at end of 5th month and at the end of treatment.
- (7) Outcome: which included: Cure, treatment completed, treatment failure, died, loss to follow up and transfer out.

Statistical analysis of data:

- Data were collected and coded to facilitate data manipulation and double entered into Microsoft Access and data analysis was performed using Statistical Package of Social Science (SPSS) software version 18 in windows 7.
- Simple descriptive analysis in the form of numbers and percentages for qualitative data, and arithmetic means as central tendency measurement, standard deviations as measure of dispersion for quantitative parametric data.

- For qualitative data, Chi square test to compare two of more than two qualitative groups.
- The P-value ≤ 0.05 was considered the cut-off value for significance.

Results:

The total number of patients included in the study was 921. The mean age of study group was (38.8 ± 17.6) years old, 63.4% of them were males versus 36.6% were females as shown in figure 1 and table 1.

19% of TB cases were from Fayoum Chest hospital, 17.2% from Etsa, 22.4% from Abshway, 11.2% were from Tamyia, 17.2% were from Senorres, 9% were from Health Insurance Organized (HIO) hospital and finally 4.1% were from prison hospital as shown in table 2.

17.9% of cases were diagnosed and received anti-TB treatment in 2013, and same percentage 17.3% in 2014, then the percentage increased to 19.2% in 2015, then increased to 23.5% in 2016, and then decreased to 22.1% in 2017 as shown in table 3.

63.8% of cases suffer from pulmonary TB, while 36.2% were affected by extra-pulmonary TB as shown in figure 2.

Pleural effusion represents the higher percentage in extra pulmonary, followed by 27% had TB lymphadenitis, and then 25.2% had TB in bone and the least percentage of 2.4% for TB peritonitis as in table 4.

83.7% of pulmonary cases show positive sputum results on diagnosis, while 16.3% were negative as in table 5.

93.2% of cases were new cases, 4.5% were relapsed cases, 1% received treatment after failure, and 0.5% received treatment after loss follow up or due to other causes as in figure 3.

Most of cases 93.2% follow category 1 treatment regimen, while 6.8% receive category 2 regimens as in figure 4.

33.2% of cases were cured of disease, 53.3% were completed treatment, 5.1% died, 5% lost to follow up 2.4% were transferred, and 1% show failure of treatment as in figure 5.

Discussion:

Tuberculosis (TB) remains one of the main health problems despite preventive and control measures that have been taken in the past few decades. It is responsible for almost 8.8 million cases and 1.4 million deaths around the world (4).

More than 90% of TB cases occur in developing countries, and about 75% happen in the 15-54 age group. Absences at workplaces due to illness and TB-related

death resulted in about a 30% family income reduction (5).

Africa is the region with the most burdens of TB cases with an estimated prevalence of 281 all forms of TB cases per 100,000 inhabitants which is doubled of the global average of 133 cases per 100,000. According to the global tuberculosis report most countries shows progress in reducing the burden of tuberculosis though it is not as targeted by the millennium development goal (6).

The total number of patients included in the study was 921, the mean age of study group was (38.8±17.6) years old. Increased incidence of TB in this age group could be explained by the increased prevalence of smoking behavior among this active age group in our society. Moreover, poverty, malnutrition, physical, mental, and occupational stress and more exposure to infection are other contributing factors. Smoking tobacco is a well-established risk factor for TB. (7)

In the present study, tuberculosis was more common among men (63.4%) than women (36.6%) which were similar to the result of **Chen HG,et al** whose study was on gender and time delay in diagnosis of pulmonary TB. He reported that the percentage of TB was higher in males (60.4) than females (39.6%). This could be explained by the fact that males are more active and are

exposed to stress more than females. Also, many females may not seek medical advice due to factors related to illiteracy, cultural and traditional attitudes which may neglect the females' health status.

In the current study, the highest incidence of tuberculous cases was in 2016 (23.5%), followed by 2017 (22.1%) while the lowest incidence was in 2014 (17.3%). This may be explained by early detection and introduction of more advanced diagnostic tools of TB in the last two years of the period of the study, such as gene expert and other tools, leading to increased incidence of diagnosed cases of TB rather than a true increase in the incidence of the disease

The study revealed that 588 of patients suffered from pulmonary TB (63.8%), while 333 of patient suffer from extra-pulmonary TB (36.2%).

The high proportion of pulmonary cases compared with the extrapulmonary ones could be attributed to the fact that TB occurs almost exclusively from inhalation of droplet nuclei containing *M. tuberculosis*, and extrapulmonary TB occurs after pulmonary disease.

As regards sputum examination for acid fast bacilli results, the study revealed that the higher percentage of pulmonary cases was positive (83.7%) and the lowest was negative (17.3%). this was partially supported by **Zedan M,et al** who's study was on Pattern of tuberculosis in patients of a university hospital during the period (2004–2011) who found that 62.2% of cases had positive sputum and 37.8% of

cases had negative sputum.

In the present study, the distribution of tuberculous cases according to the type of patient based on previous history of treatment revealed that the most common type of patients were new cases (93.2%), followed by relapse cases (4.5%), treatment after failure (1%), treatment after lost to follow(0.5) and other cases (0.9%).

This was in agreement with **Eissa SA,et al** who's study was on Assessment of tuberculosis situation in Cairo governorate from 2006 to 2012 after application of directly observed therapy short-course strategy he reported that the most common type of patients were new cases (80.3%), followed by relapse cases (10.1%), default (5.1%), failure cases (3.5%), and other cases (1.1%).

Regarding treatment regimen, we found that majority of cases received category 1(CAT 1) treatment (93.6%), and the minority of cases received category 2 (CAT 2) treatments (6.4%).

This was matching with **Negm MF,et al** whose study was on Assessment of directly observed therapy short-course (DOTs) of tuberculosis in Dakahlia governorate chest hospitals from 2006 to 2011. he reported that out of 1736 cases, 1563(90%) cases were under treatment for category I and 173 (10%) cases were under the treatment for category II.

Conclusion

The most studied cases were pulmonary smear-positive and new cases. Tuberculosis was most common in young adult population, especially the males.

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Table 1: Description of demographic characters among study group.

Variables	Frequency	
Age (years)		
Mean /SD	38.8	17.6
Gender		
Male	584	63.4%
Female	337	36.6%
Total	921	100%

Figure 1 show gender distribution among study group

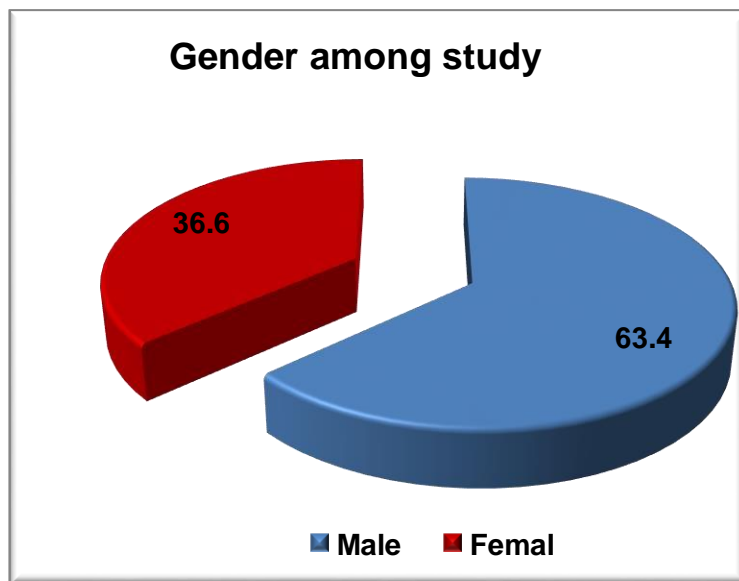


Table 2: comparison between different hospitals in which the patient registered and received anti-TB treatment.

Variables	Frequency (n=921)	
	Fayoum	175
Etsa	158	17.2%
Abshway	206	22.4%
Tamyra	103	11.2%
Senores	158	17.2%
HIO	83	9%
Prison	38	4.1%

Table 3: Frequency of patient flow per years among study group.

Variables (n=921)	Years of patients flow	
	Frequency	%
2013	165	17.9%
2014	159	17.3%
2015	177	19.2%
2016	216	23.5%

2017	204	22.1%
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Figure 2: description of types of TB among study group

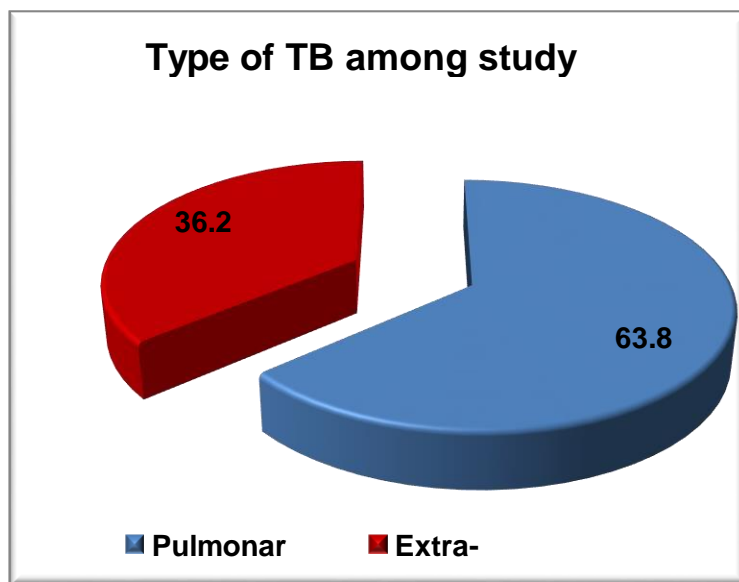


Table 4: show most common sites of extra pulmonary TB

Site of extra-pulmonary TB (n=333)		
Pleural effusion	103	30.9%
TB lymphadenitis	90	27%
Bone	84	25.2%
TB pericarditis	12	3.6%
TB meningitis	11	3.3%
TB kidney	9	2.7%
TB peritonitis	88	2.4%
TB gastritis	6	1.8%
TB larynx	3	0.9%
TB cervix	5	1.5%
TB pelvis	2	0.6%

Table 5: description of the results of sputum smear on diagnosis among pulmonary TB group.

Variables (n=588)	Pulmonary	
	No.	%
Positive	492	83.7%
Negative	96	16.3%

Figure 3: show disease category among study group

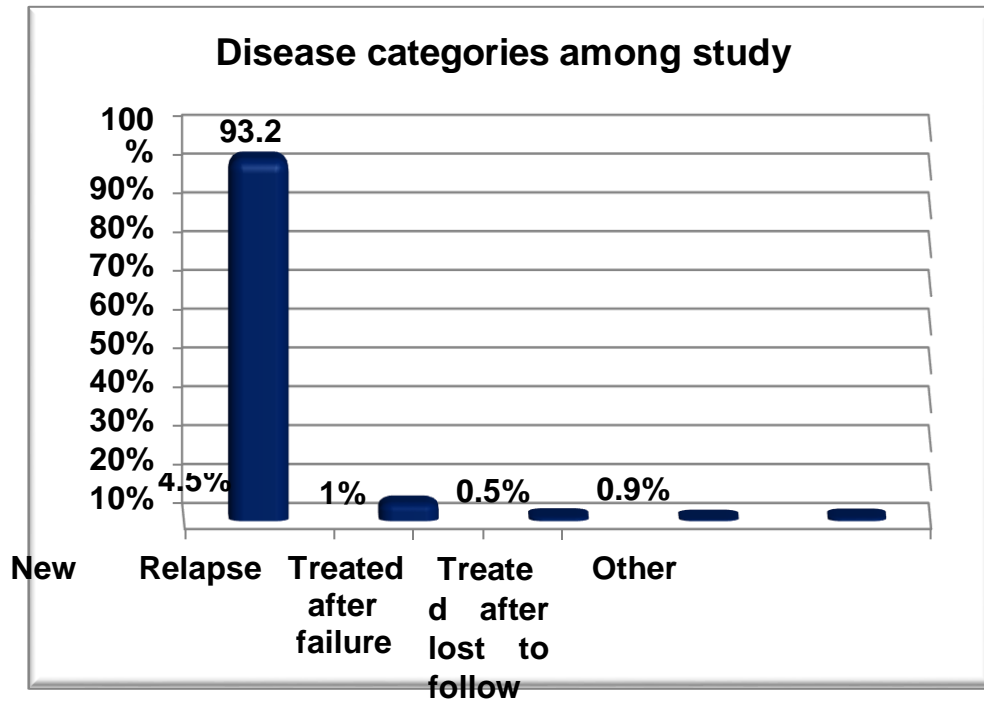


Figure 4: description of treatment regimen among study group

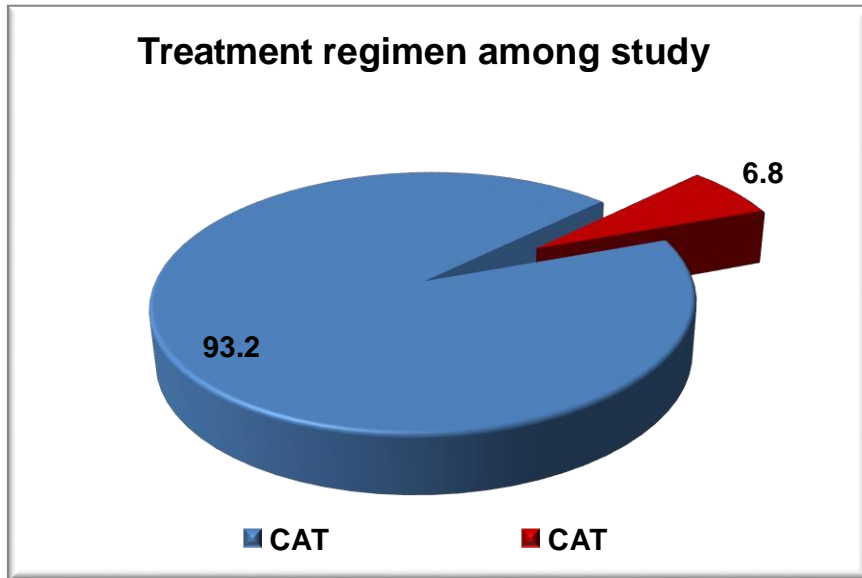


Figure 5: description of disease outcomes among study group

