

Compliance to Antituberculous Drugs among Patients in Erbil, Kurdistan Region of Iraq

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Abstract

Introduction: In Erbil, Kurdistan region of Iraq, some patients registered with tuberculosis (TB) diagnosis in Chest and Respiratory Diseases Center have interrupted treatment before completing their course, and many patients take their treatment irregularly due to different reasons. In this study, we try to determine the percentage of patients who are noncompliant to antituberculous drugs, to know the causes of noncompliance and to compare the outcome of patients taking drugs irregularly to those who take them regularly. **Materials and Methods:** Patients enrolled in this study were those who were diagnosed as having TB and registered in Erbil Chest and Respiratory Center during the years 2015 and 2016. Data were collected from patient forms and registers. For most patients, the causes of interruption in the course of treatment are not documented in the registers, and thus patients had been called by phone to know factors behind that. **Results:** Among 394 patients registered in this study, it was found that 57 patients (15%) registered to having TB have been registered as default from the treatment and 14 patients (3.55%) have interrupted their treatment because they had been wrongly diagnosed as TB. Fifteen patients (3.8%) have completed their treatment, but their follow-up was not documented. One (0.25%) of the patients completed his treatment outside Iraq. Another patient was originally from other governorates (Al-Anbar) and completed his treatment when he returned to his governorate. Two (0.5%) were non-Iraqi patients who returned to their countries and their outcome is unknown. Five (1.27%) of the patients stopped treatment due to side effects of drugs; three (0.8) of them were told by the referring doctor to stop treatment. **Conclusion:** Most TB-infected patients who were registered in Erbil Chest and Respiratory Diseases Center were compliant to the treatment but with occasional interruptions. Not all patients who were registered as default were really defaulters as many of those have completed their treatment, but their follow-up was not documented, and many were misdiagnosed as TB.

Keywords: Antituberculous drugs, compliance, Tuberculosis

INTRODUCTION

Tuberculosis (TB) is one of the oldest infective diseases that are still affecting human beings with a worldwide incidence rate of 8.8–9 million new patients annually and it causes 1.5–2 million deaths every year.^[1,2] It mainly affects lungs, but any other organ could be affected.^[3] The disease spreads by inhalation route from a tuberculous patient to others.^[4] In Iraq, it is estimated that 42 new cases of TB appear per every 100,000 population yearly.^[5]

To help countries to eradicate this disease, in 2006, stop TB strategy has been developed. This strategy concentrates at diagnosing TB as early as possible through qualified bacteriology whenever possible and starting treatment early with continuous observation and support to patients until they complete the treatment course for 6 months, and this course is called Directly Observed Treatment Short course.^[6]

In Erbil, some who registered with TB diagnosis in Erbil Chest and Respiratory Diseases Center have interrupted treatment before completing their course, and many patients take their treatment irregularly due to different reasons.

The aim of this study was to evaluate the compliance of patients to anti-TB drugs.

MATERIALS AND METHODS

In Erbil Chest and Respiratory Diseases Center, pulmonary TB is diagnosed by specialist internists based on clinical, chest X-ray findings and bacteriological examination of sputum

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samples for acid-fast bacillus by direct microscopy, GeneXpert test, and/or bacterial culture, whereas extrapulmonary TB is diagnosed by histopathological examination of tissues or by biochemical and cytological characteristics of pleural fluid, ascitic fluid, or cerebrospinal fluid according to site of the disease.

Following diagnosis and registration, all patients were given qualified anti-TB drugs from the Global Drug Facility according to the World Health Organization (WHO) guidelines. The diagnosis and treatment outcome of patients is decided and registered by specialist internists working in Erbil Chest and Respiratory Diseases Center.

All of the 394 patients registered as TB-infected patients in Erbil Chest and Respiratory Diseases Center during the years 2015 and 2016 were included in this study. Data were collected from patient forms and registers. The cause of drug interruption is not documented in the registers for most patients who have interrupted their course of treatment, and thus, they had been called by phone to know the causes behind this interruption. As the data were taken mostly from registers, informed consent was not required for this study except for the 57 patients who were contacted by phone from whom verbal informed consent was obtained.

RESULTS

The present study found that the number of patients who were registered in Erbil Chest and Respiratory Diseases Center between the years 2015 and 2016 was 394, and their characteristics are illustrated in Table 1.

Table 2 classifies patients into six categories according to the outcomes of treatment.

Table 3 gives information about the number of days different patients interrupted their treatment. Table 4 shows the maximum numbers of days where patients were off treatment consecutively. The relation between number of days off treatment and treatment outcomes is shown in Table 5.

Using paired sample *t*-test, it was found that there is a significant correlation between number of days of drug interruption and treatment outcome categories of good outcome (complete treatment and cure) and bad output (default, fail, death, and transferred out) with a *P* value of 0.000 at a confidence interval of 99%.

Table 6 details the response of patients registered as defaults to our phone calls and the cause they provided for stopping their treatment.

Table 7 divides the patients wrongly diagnosed as TB according to the site of the disease.

DISCUSSION

The present study found that most patients among those (394) who registered in Erbil Chest and Respiratory Diseases

Table 1: Characteristics of patients in the study population

Characteristic	Category	n (%)
All		394 (100.0)
Sex	Males	171 (43.4)
	Females	223 (56.6)
Type	Pulmonary	169 (42.9)
	Extrapulmonary	225 (57.1)
Sputum	Positive	109 (64.5)
	Negative	60 (35.5)
Age group (years)	<1-4	8 (2.0)
	5-14	11 (2.8)
	15-24	84 (21.3)
	25-34	80 (20.3)
	35-44	42 (10.7)
	45-54	49 (12.4)
	54-64	48 (12.2)
	65+	72 (18.3)

Table 2: Treatment outcome of patients treated for tuberculosis

Outcome	n (%)
Complete	247 (62.7)
Cure	43 (10.9)
Death	29 (7.4)
Default	59 (15)
Fail	3 (0.8)
Transferred out	13 (3.3)
Total	394 (100.0)

Center completed their treatment successfully with 73.6% rate of success although it is below the WHO recommended rate (85%);^[2] this may be due to high number of defaults and deaths [Table 2].

The present study also found that more than half of patients (57.6%) completed their course of treatment without interruption, and for the remaining patients, the treatment was interrupted by a range of 1–103 days with a mean of 20 days, and most of these interruptions were <2 weeks [Table 3]. Comparable result was found by Jakubowiak *et al.* study on Russian patients which reported 1–127 days of treatment interruption.^[7]

The number of days that patients were off treatment consecutively was ranging from 1 to 55 days with a mean of 19 days [Table 4]; this result is comparable to that found by Jakubowiak *et al.* which was 58 days.^[7] Most of patients were off their treatment for <2 weeks continuously.

Although there are conflicting data regarding the effect of drug interruptions on treatment outcome with some studies showing association between drug interruption and bad outcomes^[8] while others showing no association between drug interruption and mortality,^[9,10] the present study shows a significant association between the number of days the patients interrupted their treatment and bad outcomes including death.

Table 3: Number and frequency of days of treatment interruption

Number of days	Frequency (%)
0	227 (57.6)
1	20 (5.1)
2	19 (4.8)
3	12 (3.0)
4	8 (2.0)
5	7 (1.8)
6	7 (1.8)
7	7 (1.8)
8	8 (2.0)
9	7 (1.8)
10	7 (1.8)
11	4 (1.0)
12	4 (1.0)
13	5 (1.3)
14	4 (1.0)
15	3 (0.8)
16	2 (0.5)
17	4 (1.0)
18	1 (0.3)
19	5 (1.3)
21	2 (0.5)
23	4 (1.0)
24	3 (0.8)
25	2 (0.5)
26	2 (0.5)
27	1 (0.3)
28	2 (0.5)
29	6 (1.5)
33	1 (0.3)
35	1 (0.3)
36	3 (0.8)
42	1 (0.3)
43	1 (0.3)
46	1 (0.3)
55	1 (0.3)
57	1 (0.3)
103	1 (0.3)
Total	394 (100)

Table 4: Number and frequency of days off treatment consecutively

Number of days off treatment	Frequency (%)
0	227 (57.6)
1	23 (5.8)
2	20 (5.1)
3	19 (4.8)
4	9 (2.3)
5	4 (1.0)
6	11 (2.8)
7	4 (1.0)
8	10 (2.5)
9	4 (1.0)
10	6 (1.5)
11	5 (1.3)
12	3 (0.8)
13	5 (1.3)
14	6 (1.5)
15	2 (0.5)
16	1 (0.3)
17	9 (2.3)
18	2 (0.5)
19	3 (0.8)
20	1 (0.3)
21	1 (0.3)
22	1 (0.3)
23	3 (0.8)
24	2 (0.5)
26	1 (0.3)
27	2 (0.5)
28	1 (0.3)
29	2 (0.5)
32	1 (0.3)
35	2 (0.5)
36	1 (0.3)
46	1 (0.3)
47	1 (0.3)
55	1 (0.3)
Total	394 (100)

In the present study, 16 patients (28%) among those who were registered as defaults could not be reached either because the phone numbers provided were wrong or the numbers were no more used [Table 6]. This may be either patient did not want to reveal their numbers or they changed their numbers due to stigma, or the registering staff registered the number wrongly.

The present study found that 15 patients (3.8%) among those who were registered as defaults had actually completed their treatment courses but their treatment follow-up was not documented in the registers, which indicate poor program performance and this observation is less than 7.6% as a nondocumentation of treatment outcome by TB program which was reported by de Oliveira *et al.*,^[11] but it is more than 1.9% which was reported by Mfungwe *et al.* (2016) as

a wrong documentation by TB program in Lusaka, Zambia 2012–2013.^[12]

Fourteen patients (3.6%) had been wrongly diagnosed as TB. Although this percentage is less than 10.8% which was reported by Pedrazzoli *et al.*,^[13] and this can be explained by that the patients were registered as defaults by Erbil TB program. This may be attributed to the diagnosis of TB depending on clinical, cytological, and histopathological grounds rather than bacteriological confirmation. Moreover, many doctors still use therapeutic trial to exclude TB.

One patient (0.25%) completed his treatment outside Iraq, and another patient was originally from other governorates (Al-Anbar) and completed his treatment when he returned to his governorate. Thus, the TB program has failed to follow-up or to contact these patients to document their treatment outcome correctly in the registry.

Table 5: Outcome of treatment according to duration of treatment interruption

Days off treatment	Complete	Cure	Death	Default	Fail	TO	Total
0	118	18	24	57	1	9	227
1	13	4	2			1	20
2	13	2	1	1		2	19
3	11				1		12
4	4	4					8
5	7						7
6	5	2					7
7	6				1		7
8	6		1			1	8
9	7						7
10	5	2					7
11	3	1					4
12	3			1			4
13	4	1					5
14	3	1					4
15	3						3
16	1	1					2
17	3	1					4
18	1						1
19	4	1					5
21		1	1				2
23	3	1					4
24	3						3
25	2						2
26	2						2
27		1					1
28	2						2
29	5	1					6
33	1						1
35	1						1
36	3						3
42	1						1
43	1						1
46	1						1
55	1						1
57		1					1
103	1						1
Total	247	43	29	59	3	13	394

In the present study, the treatment had been stopped by five (1.27%) patients due to side effects of drugs; this percentage is much lower than 13% which has been reported by Breen *et al.*^[14] Three (0.8%) of the five patients were told by the referring doctor to stop treatment, which is due to noncooperation of some of private and public doctors with TB program. All of these five patients have restarted a new treatment course after the study period.

Regarding the causes of default, the present study did not find causes that are similar to those found by other studies such as early improvements and high cost of drugs as the drugs are given free of charge in Iraq^[15-17] or distance from health facility

Table 6: Response of defaulted patients to our phone call

Response	n
Closed	9
Complete	15
Died	5
Side effect (doctor told her to stop it)	3
Side effects (abdominal pain)	2
Transferred out	2
Wrong diagnosis	14
Wrong number	7
Total	57

Table 7: Site of disease for patients wrongly diagnosed as tuberculosis

Site of TB	Frequency (%)
Meningitis	3 (21.4)
Bone	1 (7.1)
Lymph nodes	2 (14.3)
Pleural	5 (35.7)
Pulmonary TB	3 (21.4)
Total	14 (100)

TB: Tuberculosis

as the population of the present study was limited to residents of Erbil city center.

The present study found that more patients with extrapulmonary disease (78.6%) were wrongly diagnosed as TB than pulmonary disease (21.4%) in the ratio of 11:3. Pedrazzoli *et al.* reported that more patients were misdiagnosed as pulmonary than extrapulmonary TB in the United Kingdom between 2001 and 2011.^[13] In the present study, pleural disease is the most frequent extrapulmonary disease that was misdiagnosed as TB, followed by meningitis [Table 7]. This may be due to the fact that these patients were diagnosed depending on fluid cytology alone.

CONCLUSION

Most TB patients who registered in Erbil Chest and Respiratory Diseases Center were compliant with treatment but with occasional interruptions. Not all patients registered as default are real defaulters as many of them have completed their treatment but not registered and many are misdiagnosed as TB.

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Conflicts of interest

There are no conflicts of interest.

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