Time and Predicting Factors of Non-compliant TB Patients to Default Treatment - A Perspective from Sudan - 2016

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ABSTRACT

Introduction: Tuberculosis is a chronic infectious disease that requiring prolonged course of treatment. The Treatment regimens recommended under Sudan National Tuberculosis Program have shown to be effective, but poor compliance is a major barrier to its management, and a challenge to the TB programs. The overall objective of this article was to identify the time and predicting factors of non-compliant TB patients who default from treatment.
Material andMethods: A cross-sectional study was conducted among TB patients registered in Kassala State. The sample size mounted to 366 participants who were selected using simple random sampling technique. A standardized administered, pre-tested and pre-coded questionnaire was used to collect the data. The questionnaire consisted of 10 sections with a total of 80 questions. A multivariate logistic regression analysis model was built using the enter method for the statistically significant variables at univariate analysis level taking P-value of 0.25 to determine the association between default and the study outcomes.
Results: 366 TB patients were included in this study, of whom 60 were identified as treatment defaulters. Majority of defaulters 46 (73.7%) discontinued their treatment at the start of the continuation phase (P-value 0.05); and only 14 (23.3%) at the intensive phase. 50 (83.3%) of the defaulters cited that they discontinued their treatment after feeling better (and wrongly perceiving it as cure), which was strongly associated with default, P-value 0.004. Also, 6 (10%) of defaulters attributed their default to drugs side effects.
Conclusion: Most of non-compliant TB patients in Kassala state defaulted at the start of continuation phase. Discontinuing treatment after feeling better (and wrongly perceiving it as cure) was found to be the major predictive factor of default from anti-TB treatment. Therefore, additional efforts to improve the compliance of patients with anti-TB treatment through TB patient education, counselling and close follow at the start of continuation phase are extremely important measures to be considered in TB control policy in the future.

Keywords: Tuberculosis, Non-Compliance; TB Treatment Phases; Predictor of Defaulting.

INTRODUCTION

Tuberculosis (TB) is considered one of the oldest chronic infectious disease that existed for thousands of years and remains a major global health problem particularly in developing countries.[1] It causes ill-health in millions of people each year. In the year 2015 it was classified as one of the top 10 causes of death worldwide, ranking above HIV/AIDS as a cause of death from an infectious disease.[1] If TB is detected early and fully treated, people with the disease quickly become non-infectious and thus the chain transmission will be cut and accordingly many lives will be saved.[2,3]

Compliance with TB treatment is considered a crucial component for the disease management and control. Compliance is simply defined as the extent to which patients follow instructions they are given for prescribed treatments.[4] This definition was further extended by the WHO as 'the extent to which a person's behavior taking medication, following a diet and/or executing lifestyle changes corresponds with agreed recommendations from a health care provider'.[5]

The WHO has provided an overview of compliance figures for various medical conditions, which concluded that compliance to long-term therapies in the general population is around 50%, but much lower in developing countries than in western society.[5] Due to the long duration of the TB therapy, there is a risk of treatment interruption or default, which contributes to prolonged infectiousness, drug resistance, relapse and death.[6,7]

Poor compliance with treatment is common despite various interventions aimed at improving treatment completion.[8] Despite the efforts with patient centered approach which allows homebased treatment supervised by a treatment supporter of their own choice, and health facility-based treatment observed by a health professional, non-compliance to treatment still pose a great challenge to TB control programs.[8] Treatment outcomes in Sudan still below the recommended targeted level set by WHO, which is ≥ 90%. In 2014 the treatment success rate in Sudan was 82%.[1]

Multiple factors influenced non-compliance with TB treatment including inadequate knowledge about TB[9], low socioeconomic status, particularly education level[10] and income[11], poor management of drugs side effects[12], problem in the drug supply chain[13], age[14], gender[15,16], dissatisfaction with the treatment and its delivery, drugs significant side-effects such as hepatitis, dyspepsia, which were responsible for termination of therapy in up to 23% of patients during the intensive phase[17], and lack of financial and nutritional support.[18]

WHO reports that poor treatment has resulted in evolution of mycobacterium TB strains that do not respond to treatment with standard first line, resulting in the emergence of multi-drug resistance tuberculosis (MDR-TB) in almost every country across the globe.[19] In 2015 alone, there were an estimated 480,000 new cases of MDR-TB and an additional 100,000 people with rifampicin-resistant TB who were also newly eligible for MDR-TB treatment.[1]

Since 1990, the WHO recommends that non-compliance should

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not exceed 5%.[20] In 1994, WHO has recommended Direct Observed Treatment Strategy (DOTS) to enhance compliance with TB treatment. DOTS has been introduced in TB control programs in many countries with varying degrees of success.[21,22] The adoption of this strategy has been associated with reduced rate of treatment failure, relapse and drug resistance, but its impact in reducing TB incidence has been limited by non-compliance to DOTS.[23] In some countries where DOTS has not been fully implemented non-compliance to self-administered TB treatment is common and has been identified as an important reason for failure of treatment.[24]

Time of default from TB treatment differ from country to country. Previous studies had suggested that in some countries majority of non-compliant default in intensive phase,[25,26] and some others suggested that majority default in continuation phase.[14,27-29] To my best knowledge, in Sudan, no specific study has been conducted to investigate the time at which non-compliant TB patients tend to default and by which factors possibly being predicted. This study aimed at identifying time and predicting factors of tuberculosis treatment default in Sudan, particularly eastern part. The results of this study might enhance the efforts exerted by the National TB Control Program in developing measures to address the barriers to treatment adherence in future.

MATERIAL AND METHODS

The study design was a cross-sectional study with total number of participants mounted to 366 TB patients, registered in Kassala State during 2015 to 2016. The state lies in eastern part of Sudan, and includes 11 localities. A standardized administered pre-tested, pre-coded questionnaire was used to collect the data.

STATISTICAL ANALYSIS

Epi-info statistical package software was used to estimate the minimum required sample size with confidence interval level of 95%, at the power of 80%, p-value less than 0.05, and odds ratio 1.5. Data analysis was conducted using SPSS version 19.0. A multivariate logistic regression analysis model was used taking P-value of 0.25 at the univariate level as a cutoff point for inclusion in the main effect logistic regression model as proposed by senior statisticians.[30] The logistic regression model used to calculate adjusted odds ratio.

RESULTS

Majority of default occurs among the age group 30 to 59 years. Majority of defaulters were male (76.7%). 75% of defaulters live in rural areas. Illiteracy is predominant among defaulters (46.7%). 98.3% of defaulters have no regular income. 84.7% have no enough income and sometime or always in debt (table-1).

Majority of non-compliant TB patients defaulted at the start of continuation phase (77%) (figure-1).

The most common reason for default (83.3%) is stopping treatment after feeling improved (wrongly perceiving it as cure) and 10% attributed their default to drugs side effects (figure-2). On univariate analysis, defaulting at the start of continuation phase (timing) was significant (OR = 8.01, 95% CI: 4.9 to 13.6, P-value 0.05). On multivariate analysis, stopping treatment after feeling better was the strongest predictor of the default (OR 5.278, 95% CI: 3.981 to 9.36 and P-value 0.004).

Characteristics		Default		Compliant	
		No.	%	No.	%
Gender	Male	46	76.7	209	68.3
	Female	14	23.3	97	31.7
	Total	60	100	306	100
Residence	Urban	10	16.7	108	36.1
	Peri-urban	5	8.3	29	9.7
	Rural	45	75.0	162	54.2
	Total	60	100	306	100
Age in years	10-20	4	6.7	50	16.3
	21-29	4	6.7	47	15.4
	30-39	15	25.0	69	22.5
	40-49	16	26.7	55	18.0
	50-59	14	23.3	37	12.1
	60+	7	11.7	48	15.7
	Total	60	100	306	100
Educational level	Illiterate	28	46.7	112	37.1
	Khalwah	9	15.0	75	24.8
	Basic	18	30.0	94	31.1
	Secondary	5	8.3	18	6.0
	University & above	0	0.0	3	1.0
	Total	60	100	306	100
Current occupation	Not working	0	0.0	3	1.0
	Employee	0	0.0	1	0.3
	Skilled Laborer	1	1.7	3	1.0
	Unskilled laborer	23	38.3	23	8.0
	Professional	0	0.0	3	1.0
	Pensioned	0	0.0	3	1.0
	Merchant	0	0.0	2	.7
	Unemployed	13	21.7	36	12.6
	Housewife	12	20.0	69	24.1
	Casual work	8	13.3	56	19.6
	Student	1	1.7	22	7.7
	Shepherd/ Farmer	1	1.7	33	11.5
	Other	1	1.7	32	11.2
	Total	60	100%	306	100%
Income regularity	No	59	98.3%	264	91.7%
	Yes	1	1.7%	24	8.3%
	Total	60	100	288	100%
Income amount	Enough, plus saving	0	0.0	4	1.7
	Enough, no saving	9	15.3	15	6.3
	Sometimes in debt	22	37.3	91	38.1
	Always in debt	28	47.5	129	54.0
	Total	59	100	239	100

Table-1: Background characteristics of the study population

DISCUSSION

Tuberculosis is a chronic infection that is cured by taking several antibiotics for a long period of time. Compliance is an integral part of treatment success. Some patients fail to complete treatment due to multiple factors, including lack of awareness about TB and its treatment and low socio-economic status.

In this study, majority of defaulters 45 (75%) are from the age group 30 to 59 years and live in rural areas. This findings is tallying with results from studies conducted in India in 2015.[14,31]

Probably this might be due to the fact that older generations were less educated compared to the younger ones. TB patients living in rural areas are probably less educated, and have lower income sources than those living in urban areas. Also, majority of the defaulters were males. This might be due to the fact that females, particularly those living in rural areas (who were predominant in this study) have less opportunities to seek and access health facilities, to pursue and complete their education, and less opportunities to find a job that satisfy their financial needs. These findings were tallying with many studies, including one reported 66% of defaulter were male and another one reported 75.6% of defaulter were male.[15,16]

Majority of non-compliants default at the start of continuation phase. Probably this might be attributed to the fact that TB patients at this point of time do feel improved and free of symptoms, so they wrongly perceived they are free of the disease and no need to continue taking more drugs which might come up with adverse effects on them. Similar finding was observed in many studies conducted during the year 1994 to 2015. In Ethiopia; in the year 1994 Demissie and Kebede, reported that most of the defaults occurred in the 3rd and 4th months of treatment[27], and in 2002 Tekle, Mariam DH and Ali A observed that majority of defaults (81%) occurred during the continuation phase.[28] Similar finding was also observed in study conducted in Ghana, 2005, by Dodor and Afenyadu, who found the mean defaulting moment was 3.4 months.[29] Also, similar finding was observed in study conducted in India, 2015 by Gorityala and colleagues; in which majority of default events were found to occur during early continuation phase.[14]

In this study feeling better after treatment (and wrongly perceiving it as cure) was the main reason for non-compliance and most significant predictor of it at the start of the continuation phase. TB patients often feel improved after starting treatment, and some of them wrongly perceive it as cure and discontinue their treatment. This might be due to the lack of knowledge and awareness about the disease, its treatment and the unfavorable consequences of non-compliance with the treatment. The predominant illiteracy and low socio-economic status among non-compliant TB patients in Kassala state, would definitely have its shadow on this type of behavior. So, the doctors would be unable to convey adequate information to the TB patients to increase their awareness and understanding about the disease and treatment. Education is a key factor in communicating health information to TB patient. People with low level of education are more unlikely to understand the details of health information. Similar finding has been observed in many studies as cause for non-compliance.[27,32-33]

It is known that early default during treatment is likely to lead to adverse outcomes like treatment failure, death and anti-TB drug resistance. So, the early on intervention, at the start of TB case diagnosis will be helpful in mitigating default. Such patients should be given sufficient explanation of their disease, the treatment requirements, the likely side effects to be encountered when using anti-TB drugs and the risk of not complying with the treatment. In the absence of TB patient education and counselling, patients may mistake the feeling of improvement to cure, thus discontinued TB medication early.

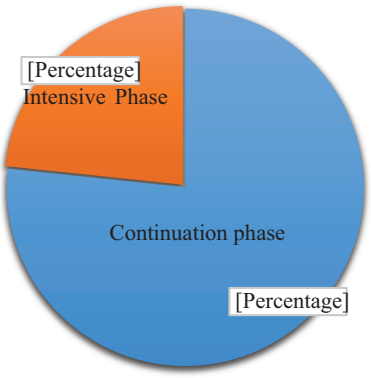

Figure-1: Percentage of default at intensive and continuation phase.

CONCLUSION

This study revealed that most non-compliant TB patients in Kassala State default at the start of continuation phase, and as well majority of them discontinue treatment after feeling better (and wrongly perceiving it as cure). Therefore, additional efforts to improve the compliance of patients with anti-TB treatment through close follow up, TB patient education, counselling, home visit and a better management in accordance with patient's specific age group might be an important measures to be considered in TB control program in the future. TB patient education to raise the knowledge and awareness about TB and its treatment should be well emphasized early on at the time of diagnosis and maintained well all through the treatment course. The key for the success of these measures, is the proper and effective training of TB patients' caregivers working in all TB treatment centers in Kassala State. More resources need to be

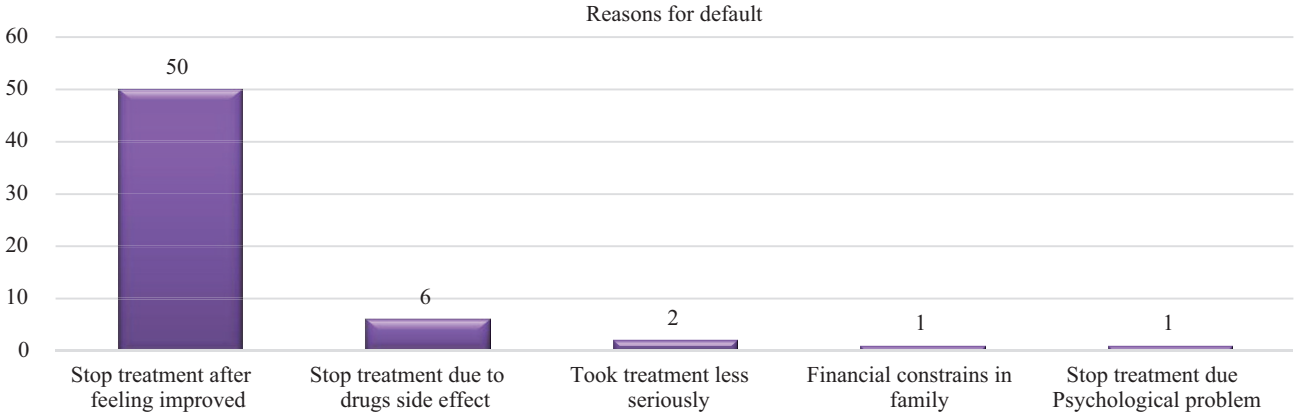

Figure-2: Reasons for default.

committed in future to ensure that these goals are reached.

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