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Research Article

Risk Factors for Default from Tuberculosis (TB) Treatment in Patients Attending a Rural Sudanese Hospital

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Abstract

Background: Default from tuberculosis (TB) treatment is a major health concern. High rates of default are still reported in Sudan despite availability of effective anti-tuberculosis drugs.

Objective: The objective of this study was to identify risk factors associated with non-adherence to TB treatment in patients attending a rural Sudanese hospital.

Methods: Unmatched case-control study was carried out. Cases (34) were patients defaulted from TB treatment and controls (126) were patients who completed treatment course during 2011and 2015. A tested questionnaire was used to collect data.

Results: From a cohort of 160, default rate was 34 (21.3%). The risk factors to default TB treatment related to socio-demographic factors were unemployment (58.8% and 27.0% for cases and controls respectively, odds ratio = 1.9), low income (64.7% and 48.4% for cases and controls respectively, odds ratio = 1.3) and alcohol use (14.7% and 2.4% for cases and controls respectively, odds ratio = 1.3). Other risk factors to default TB treatment were: Travelling while under treatment (50.0% and 37.3% for cases and controls respectively, odds ratio = 1.6) feeling neglected (55.9% for cases and 42.1% for controls, odds ratio = 1.7), experience of losing hope (67.7% and 57.1% for cases and controls respectively, odds ratio = 2.3) and bad perception towards medication (67.7% for cases and 46.8% for the controls, odds ratio = 1.4).

Conclusion: The rate of default from TB treatment in patients attending a Sudanese hospital is high. The risk factors for default TB treatment were: unemployment, low income, alcohol use, travelling while under treatment, feeling neglected, experience of losing hope and bad perception towards medication.

Keywords: *Risk Factors; Default Treatment; Tuberculosis*

Introduction

Background

Tuberculosis (TB) is one of the top ten causes of global mortality [1]. The disease is a major contributor to the global burden of disease and has received considerable attention in recent years, particularly in low and middle-income countries [2].

Tuberculosis can be cured using a combination of antibiotics for at least six months but many patients fail to complete their treatment. The most important recent changes in the natural history of the disease have been the impact of HIV epidemic and the emergence of resistance to anti-TB drugs [3].

Sudan alone carries 11 - 15% of the tuberculosis burden in the Eastern Mediterranean Region (EMR). The estimated incidence of new tuberculosis cases in 2010 was 119 per 100 000 population, and the estimated prevalence was 209 per 100 000, causing an overall death

rate of 24 per 100 000 annually. Treatment success rate in Sudan is below the WHO target of 85% reaching only 82% with the defaulter rate of 10% [4]. Adherence to TB treatment continues to be one of the major obstacles that TB control programs worldwide have to deal with, especially in developing countries [5]. The main reasons leading to treatment default are: male gender, unemployment, being married, alcohol use during treatment course, poor knowledge about TB, inaccessibility of health services, unsatisfactory opinion about the health care worker, poor relationship between provider and patient, improper interpretation of recovery and wellness from disease, low income, illiteracy, long treatment course, loss of personal motivation, side effects of drugs, stigma, lack of family support and changing residence during treatment [6-8]. The objective of the current study was to determine the risk factors of default to pulmonary tuberculosis treatment in a rural Sudanese hospital.

Methods

The research design was unmatched case control study. The study was conducted in Al-muglad rural hospital, Al-Muglad locality, West Kordofan state in Western Sudan. The area was affected by civil war, most population was nomads and rainy season affects population movement. This facility provides health services to an area of high prevalence rate of tuberculosis. All TB patients registered in Al-muglad rural hospital records (319 patients) during January 2011-december 2015 were included as study population.

There were 319 TB patients registered in Al-muglad rural hospital. Forty-two of these patients defaulted from treatment but we were able to reach and collect data from thirty-four defaulters. Eight patients were not reached because either due to their incorrect address registered in hospital records or death. In the side of controls the registered patients were 277, we selected 126 patients randomly to be recruited as controls. Low monthly income was estimated as 425 SDGs (96.5 $) and less.

A pre-tested questionnaire was used to collect data which included socio-demographic, personal characteristics and treatment related factors. Data was analyzed by SPSS, version 21. An odds ratio was employed to compare variables between cases and controls. Ethical approval was obtained from the authorities and an informed consent was obtained from all participants.

Results

In table 1 the age group 15 - 44 years constituted 82.4% and 91.1% in the cases and controls respectively. The age group 45 - 64 years constituted 17.6% for the cases and 8.8% for the controls. The married patients constitute 35.3% of the cases and 57.9% of the control group. Single participants constituted 26.4% and 20.6% for cases and controls respectively. Divorced/widowed represented 38.3% and 21.5% in cases and controls respectively. Regarding employment status, 58.8% of the cases were unemployed compared to 27.0% for the controls. For monthly income, 64.7% and 48.4% in cases and control were having low income respectively. Regarding alcohol use, 14.7% and 2.4% of cases and controls consume alcohol respectively.

Table 2 shows risk factors for default from TB treatment. The results showed that 55.9% and 68.3% of cases and controls spent less than one hour to reach a health facility that provides TB services (odds ratio = 0.59). Forty one point two percent of the cases resided less than 2.5 Km from a health facility that provides TB services compared to 51.6% for the controls (odds ratio = 0.6). Half (50.0%) of the cases were travelling while under TB treatment compared to 37.3% of the controls (odds ratio = 1.6). Regarding perception of the subjects towards health staff attitude, results showed that 41.2% and 76.2% of the cases and controls perceived that attitude was friendly (odds ratio = 0.7). More than half (55.9%) of the cases and 42.1% of the controls experienced feeling of neglect (odds ratio = 1.7). Concerning perception of patients towards medication, 64.7% and 57.1% of the cases and controls were comfortable with the big number of tablets (odds ratio = 1.4). Regarding experience of losing hope during treatment, it was shown that 67.6% and 46.8% of the cases and controls experienced losing hope during treatment (odds ratio = 2.3).

Social factor	Cases (34)		Controls (126)		Odds ratio	95% CI
	Freq.	%	Freq.	%		
Age/year:						
15-44	28	82.4	115	91.2	0.2	0.03 - 0.42
45- 64	6	17.6	11	8.8		
Marital status:						
Single	9	26.4	26	20.6	0.5	0.32 - 0.89
Married	12	35.3	70	57.9		
Divorced/ Widowed	13	38.3	30	21.5		
Employment status:						
Employed	14	41.2	92	73.0	1.9	0.87 - 2.34
Unemployed	20	58.8	34	27.0		
Income:						
Low	22	64.7	61	48.4	1.3	0.69 - 1.88
Moderate	12	51.6	65	35.3		
Alcohol use:						
Yes	5	14.7%	3	2.4%	1.3	1.16 - 2.93
No	29	85.3%	123	97.6%		

Table 1: *Social characteristics of Patients with treatment default (cases) to patients with treatment success without relapse (controls).*

Variable	Cases (n = 34)		Control (n = 126)		Odds ratio	95% CI
	Freq.	%	Freq.	%		
Time to reach a health facility:						
Less than one hour	19	55.9%	86	68.3%	0.59	0.11 - 1.23
One hour and more	15	44.0%	40	31.7%		
Distance to reach a health facility:						
< 2.5 Km	14	41.2%	65	51.6%	0.6	0.36 - 1.71
2.5 km and more	20	58.8%	61	48.4%		
Travelling while under treatment:						
Yes	17	50%	47	37.3%	1.6	0.21 - 2.99
No	17	50%	79	62.7%		
Perception of staff attitude:						
Friendly	14	41.2%	96	76.2%	0.7%	0.42 - 0.85
Unfriendly/Indifferent	20	58.8%	30	23.8%		
Feeling neglected:						
Yes	19	55.9%	53	42.1%	1.7	0.19 - 2.75
No	15	44.1%	73	57.9%		
Perception towards medication:						
Good	22	64.7%	72	57.1%	1.4	0.04 - 1.73
Bad	12	35.3%	54	42.9%		
Experience of losing hope:						
Yes	23	67.7%	59	46.8%	2.3	1.65 - 3.66
No	11	32.4%	67	53.2%		

Table 2: *Risk factors for default from TB treatment of Patients with treatment default (cases) to patients with treatment success without relapse (controls).*

Discussion

We observed that 21.3% (34/160) of subjects receiving TB treatment defaulted during our study.

This rate is higher than the rate of 16.7% in Kenya [9]. It is also higher than the rates of 14% and 15% reported in Khartoum and Gezira states in Sudan [10,11]. This is expected since this area is affected by wars and unrest. Population movement is also affected during the rainy season. Health services are not adequate and some population has difficulty in accessing health services. This is less than default rate of 35.3% presented by Tesfahuneygn G., *et al*. in Ethiopia [12].

Social factors identified for TB treatment default in this cohort were employment status, income and alcohol use. Results revealed that 58.8% of the defaulters were not employed compared to 73.0 % of the employed (odds ratio = 1.8; CI = 0.87 - 2.34). This finding is consistent with a study conducted in Egypt [13]. Patients with low income, less than 425 SDGs (96.5 $) tend to default from TB treatment more than patients with high income (64.7% vs 48.4%, odds ratio = 1.3; CI = 0.69 - 1.88). This finding is in line with other studies [14-16]. This may be due to the fact that the employed have income that help improving nutritional status and some employees have better access to health services.

According to this study, 14.7% of patients who consume alcohol default from TB treatment compared to 2.4% for those who don't use alcohol (odds ratio = 1.3; CI = 1.16 – 2.93). This finding is consistent with a study conducted in Russia and Kenya [17,18]; however, it contradicts another study in India, Morocco and Egypt [9,13,19]. Alcohol use has been frequently reported as a risk factor for default because altered behavior leads to forget to take medicines and increase chance to develop resistance which may subsequently lead to poor compliance. Fifty percent of the defaulted patients were traveling while receiving treatment compared to 37.3% who were not traveling (odds ratio = 1.6; CI = 0.21 - 2.99). This finding is consistent with a studies conducted in South Africa, Brazil, Egypt, Kenya and Sudan [9,10,20-22]. Movement and instability of patients may lead them to forget to take medications.

Results showed that 55.9% of the patients who felt neglected defaulted from TB treatment compared to 42.1% who didn't experience the feeling of neglect (odds ratio = 1.7; CI = 0.19 - 2.75). This finding consisted with studies done in Sudan and Kenya [18,23]. This may reflect the need for support specially when considering a long duration of TB treatment.

Default from TB treatment is related to perception of patients towards medication, 64.7% of cases had good perception towards medication compared to 57.1% of controls (odds ratio = 1.4; CI = 0.04 - 1.73). The feeling that the number of tablets patients takes is too big, this may lead to withdraw taking them. This finding is in line with Mwangi BK et al from Kenya18. Many defaulted patients (67.7%) experience losing hope while under treatment compared to 46.8% in patients who didn't experience the same feeling (odds ratio = 2.3; CI = 1.65 - 3.66). This feeling may reflect the weakness of applications of DOTS strategy; if patients were supported they may not experience the feeling of neglect.

Conclusion

In conclusion, the rate of default from tuberculosis treatment in patients attending Al- Muglad hospital is high. The risk factors identified for default from TB treatment were: unemployment, low income, alcohol use, travelling while under treatment, feeling neglected, experience of losing hope and bad perception towards medication.

Limitation of the Study

This study was conducted in one rural hospital; the results can't be generalized to the whole country.

Conflict of Interest

The authors have no conflict of interest to declare.

Bibliography

1. "The world health report 2000. Health systems: improving performance". Geneva, World Health Organization, (2000).

2. WHO. "Global tuberculosis Report 2015". 2nd edition.

3. WHO. Implementation the WHO Stop TB Strategy. A hand book for Natural Tuberculosis Control Programs (2008).

4. Stop TB Partnership. "Compendium of indicators for monitoring and evaluation national tuberculosis programs". Geneva: World Health Organization (2004).

5. Yusuf KO., *et al*. "Non-Adherence and its Contributing Factors to Anti-TB Drug in Children's at Adama Referral Hospital, Oromia, Ethiopia". *Global Journal of Medical Research: B Pharma, Drug Discovery, Toxicology and Medicine* 15.2 (2015): 1-9.

6. Jaggarajamma K., *et al*. "Reasons for non-compliance among patients treated under revised national tuberculosis control program (RNTCP) Tiruvallur district, South India". *Indian Journal of Tuberculosis* 54.3 (2007): 130-135.

7. Kigozi G., *et al*. "Factors influencing treatment default among tuberculosis patients in a high burden province of South Africa". *International Journal of Infectious Diseases* 54 (2017): 95-102.

8. Kelly E Dooley., *et al*. "Risk factors for tuberculosis treatment failure, default, or relapse and outcomes of retreatment in Morocco". *BMC Public Health* 11 (2011): 140.

9. Muture BN., *et al*. "Factors associated with default from treatment among tuberculosis patients in Nairobi Province, Kenya: A case control study". *BMC Public Health* 11 (2011): 696.

10. Ali AO A and Prins MH. "Patient non-adherence to tuberculosis treatment in Sudan: socio demographic factors influencing non-adherence to tuberculosis therapy in Khartoum State". *The Pan African Medical Journal* 25 (2016): 80.

11. Ismail SA., *et al*. "Determinants of Default from Tuberculosis Treatment among Tuberculosis Patients at a Hospital Chest Clinic in Gezira State, Sudan". *International Journal of Public Health and Clinical Sciences* 3.6 (2016): 1-10.

12. Tesfahuneygn G., *et al*. "Adherence to Anti-tuberculosis treatment and treatment outcomes among tuberculosis patients in Alamata District, northeast Ethiopia". *BMC Research Notes* 8 (2015): 503.

13. El-Shabrawy M and El-Shafei DA. "Evaluation of treatment failure outcome and its predictors among pulmonary tuberculosis patients in Sharkia Governorate, 2013–2014". *Egyptian Journal of Chest Diseases and Tuberculosis* 66 (2017): 145-152.

14. Herrero MB., *et al*. "Determinants of non-adherence to tuberculosis treatment in Argentina: barriers related to access to treatment". *Revista Brasileira de Epidemiologia* 18.2 (2015): 287-298.

15. Kitayaporn OK. "Factors contributing to treatment success among tuberculosis patients: a prospective cohort study in Bangkok". *International Journal for Tuberculosis and Lung Diseases* 12.10 (2008): 1160-1165.

16. Hasker E and Khodjkhanov. "Default from TB treatment in Uzbekistan who are these defaulters and why do they default?" *Biomedical Central Infectious Diseases Journal* 8 (2008): 97.

17. Sansone RA and Sansone LA. "Alcohol/substance misuse and treatment: Fatal Attraction". *Psychiatry* 5.9 (2008): 43-46.

18. Mwangi BK., *et al*. "Factors Associated with Default from TB Treatment Among Tuberculosis Patients in BUSIA Country". *International Journal Advances in Social Science and Humanities* 4.8 (2016): 27-35.

19. Pandit N. "A study of treatment compliance in directly observed therapy for tuberculosis". *India Journal of Community Medicine* 31.4 (2006): 241-243.

20. Finlay A., *et al*. "Patient- and provider-level risk factors associated with default from tuberculosis treatment, South Africa, 2002: a case-control". *BMC Public Health* 12 (2012): 56.

21. Pedro Emmanuel AMB and Braga JU. "Meta-analysis of factors related to health services that predict treatment default by tuberculosis patients". *Cadernos de Saúde Pública* 24.4 (2008): S485-S502.

22. Nour El-Din M., *et al*. "Factors affecting defaulting from DOTS therapy under the national program of tuberculosis control in Alexandria, Egypt". *Eastern Mediterranean Health Journal* (EMHJ) 19.2 (2013): 107-113.

23. Abdelhadi MA., *et al*. "Factors associated with default from treatment among tuberculosis patients in Kassala State". *Journal of Public Health and Epidemiology* 7.6 (2015): 183-188.

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