ORIGINAL ARTICLE

Treatment Outcomes of Tuberculosis Patients Under Directly Observed Treatment Short Course Program at a Tertiary Care Hospital of Rawalpindi

Farhan Hassan[1], Sidra Tul Muntaha[2], Fazal Mahmood[3]

ABSTRACT

Objective: To determine the treatment outcomes of tuberculosis patients registered under directly observed treatment short course (DOTS) program at Holy Family Hospital, Rawalpindi.

Study Design: Descriptive Case Series.

Place and Duration of Study: TB DOTS Clinic, Holy Family Hospital, Rawalpindi from September 2015 to March 2016.

Materials and Methods: A total of 75 tuberculosis patients were enrolled by consecutive sampling. Data was collected by means of structured proforma in which demographic details of patients were entered along with information regarding site of TB and treatment outcomes and success of outcomes. "*Cured" was labeled for those* patients who finished six months treatment with negative sputum microscopy result for Acid Fast Bacillus (AFB) at the end of treatment. "*Treatment Completed" was labeled for those p*atients who finished six months treatment, but no sputum microscopy result for AFB at the end of treatment. Data was analyzed using SPSS version 17.

Results: Majority (61.3%) of patients coming to TB center were females showing increased frequency of women having tuberculosis in the setting. Most of the patients belonged to urban area i.e. 65.3%. In our study, a healthy finding was observed that the commonest treatment outcome was treatment completed (65.3%) followed by 21.3% of cured ones and treatment failure was very low (2.7%).

Conclusion: Majority of the tuberculosis patients registered under directly observed treatment short course program at Holy Family Hospital, Rawalpindi had successful treatment outcomes. It is recommended that patients with unsuccessful treatment outcomes should be followed up for health education as well as treatment accordingly.

Key Words: *DOTS, Tuberculosis, Outcomes.*

Introduction

World Health Organization (WHO) announced Tuberculosis (TB) as a worldwide "public health emergency" in 1993.[1] Tuberculosis (TB) is one of the most debilitating diseases of the world.[2] Global Health Report of WHO, 2010 shows 9.4 million patients of Tuberculosis in overall world. MDGs target set for TB control is to "halt and reverse the incidence of TB by 2015". The most important & effective measure to control TB is early detection of TB and completing treatment of those who get diagnosed of disease and get cured. Most of TB mortality and morbidity (95%) is reported in low and middle-income countries.[3] Pakistan ranks fifth amongst "22 high burden countries (HBCs)", contributing around 63% of disease burden in Eastern Mediterranean Region (EMRO). Government of Pakistan initiated "DOTS strategy (Directly Observed Treatment Short course)" recommended by WHO for effective control of this menace in 1995 and declared TB a national health emergency in 2001.[4] Lot of researches have been carried out globally on the TB treatment outcomes, as evident by a study conducted in Ethiopia which has evaluated pattern of Tuberculosis and its "treatment outcomes" over past few years. 64.6% were declared as treatment completed, 18% as cured, 5.1% defaulted, 5.4% transferred out.[3] A study

[1]*Department of Community Medicine*
Rawalpindi Medical University, Rawalpindi
[2]*Department of Pediatrics*
Yusra Medical & Dental College, Islamabad
[3]*Department of Community Medicine*
HBS Medical & Dental College, Islamabad

Correspondence:
Dr. Farhan Hassan
Senior Demonstrator
Department of Community Medicine
Rawalpindi Medical University, Rawalpindi
E-mail: farhan.25hd@hotmail.com

Funding Source: NIL; Conflict of Interest: NIL
Received: January 24, 2019; Revised: May 12, 2019
Accepted: May 14, 2019

of India showed that with DOTS, the cure rate was 94.6%.[2] A similar study has been carried out in Karachi on TB treatment outcomes which showed successful outcome in 47.2% patients and 47.2% were lost to follow up and defaulted, 5.6% were treatment failure.[5] A study done in Kohat showed 32.6% cure rate, 41.3% treatment completed and 25% default rate.[6]

The key to control of TB includes case finding as early as possible and its prompt treatment. Monitoring of treatment outcomes is important to evaluate DOTS programme which in turn prevents development of resistant TB.[7] The present study was aimed to evaluate the DOTS program in a tertiary care setup in terms of assessment of treatment outcomes of TB patients registered under DOTS programme at Holy Family Hospital, Rawalpindi. This will add to the current knowledge about DOTS program efficiency in study setting in terms of treating TB patients to achieve successful treatment outcomes. This study will be helpful for public health authorities to take action accordingly as per WHO standards.

Materials and Methods

It was a Descriptive Case Series conducted at TB DOTS clinic, Holy Family Hospital, which is a tertiary care teaching hospital attached with Rawalpindi Medical University, Rawalpindi, Pakistan. Duration of study was six months (from September 2015 to March 2016). Non Probability Consecutive Sampling was used and sample size was 75. All newly diagnosed cases of pulmonary as well as extra-pulmonary tuberculosis of both male as well as female gender aged 18-65 years were included in study. Cases transferred-in from other health facilities were excluded from the study. Data was entered in proforma. Age, sex, place of residence and site of tuberculosis were entered in proforma. All the patients underwent six months treatment for tuberculosis using Anti-tuberculosis therapy (ATT). During initial two months (Intensive Phase), four drugs namely Isoniazid, Rifampicin, Ethambutol and Pyrazinamide were given. Only two drugs Isoniazid and Rifampicin were given in next four months treatment (Continuation Phase). Patients were followed till the end of the treatment course and relevant information was entered in proforma. Finally "treatment outcomes" were entered by the conclusion of treatment course. Treatment outcomes were labeled as "Successful" if it came out to be either "Cured" or "Treatment Completed"; and as "Unsuccessful" if came out to be as "Treatment Failure", "Defaulted", "Died" or "Transferred Out". "Cured" was labeled for those patients who finished six months treatment with negative sputum microscopy result for Acid Fast Bacillus (AFB) at the end of treatment. "Treatment Completed" was labeled for those *p*atients who finished six months treatment, but no sputum microscopy result for AFB at the end of treatment. "Treatment Failure" was labeled for those patients who remained sputum positive for AFB at five months despite correct intake of medication. "Defaulted" was labeled for those patients who interrupted their treatment for two consecutive months or more after registration. "Died" was labeled for those *p*atients who died during the course of treatment. "Transferred out" was labeled for those patients whose treatment outcomes are unknown due to transfer to another health facility. The data was entered and analyzed in Statistical Package for Social Sciences (SPSS) version 17. Frequency and percentages were calculated for variables like gender, age categories, treatment outcomes and success of outcomes.

Results

Total of 75 patients participated in the present study, out of them 29 were males and 46 were females. Out of 75 patients, 34 patients were aged between 18-25 years as shown in Table no. I. 26 were from rural areas and 49 from urban areas. 27 patients were pulmonary sputum positive and 12 were pulmonary sputum negative and 36 were extra pulmonary cases. Frequency of treatment outcome and success of outcome is shown in Table II and III respectively. Cross tabulations of success of outcome with age category and gender is shown in Table IV and V respectively.

Table I: Age Distribution

Age Category (years)	Frequency	Percent	Cumulative Percent
18-25	34	45.3	45.3
26-35	16	21.3	66.7
36-45	12	16.0	82.7
46-55	8	10.7	93.3
56-65	5	6.7	100.0
Total	75	100.0	

Table II: Frequency of Treatment Outcomes

Treatment outcome	Frequency	Percent	Cumulative Percent
Cured	16	21.3	21.3
Treatment completed	49	65.3	86.7
Died	2	2.7	89.3
Treatment failure	2	2.7	92.0
Defaulted	3	4.0	96.0
Transferred out	3	4.0	100.0
Total	75	100.0	

Table III: Frequency of Success of Outcome

Success of Outcome	Frequency	Percent	Cumulative Percent
Successful	65	86.7	86.7
Unsuccessful	10	13.3	100.0
Total	75	100.0	

Table IV: Cross Tabulation of Success of Outcome with Age

Age Category (years)	Success of Outcome		Total
	Successful	Unsuccessful	
18-25	30	04	34 (45.3%)
26-35	15	01	16 (21.3%)
36-45	10	02	12 (16.0%)
46-55	07	01	8 (10.7%)
56-65	03	02	5 (6.7%)
Total	65	10	75 (100.0%)

Table V: Cross Tabulation of Success of Outcome with Gender

Gender	Success of Outcome		Total
	Successful	Unsuccessful	
Male	26	03	29 (38.7%)
Female	39	07	46 (61.3%)
Total	65	10	75 (100.0%)

Discussion

In our study, majority (61.3%) of patients coming to TB centers were females showing increased incidence of women having tuberculosis in the settings. Risk of tuberculosis in females may be clarified by the difference in exposure to mycobacterium tuberculosis which in turn may be related to gender specific differentiation of labor, traditional seclusion practices and socialization arrangements. Higher frequency of advanced disease might be observed due to poorer quality of health of females compared to males with respect to nourishment. According to World Health Organization (WHO), at few places, for example Iran, Afghanistan and areas of Pakistan bordering Afghanistan, higher number of females in comparison to males are diagnosed as TB patients, however worldwide, considerably higher number of males in comparison to females develop the disease and expire due to TB per annum.[8] Similar results were seen in the province of Yazd, in Iran, where average yearly rate of TB was higher in females being 31.0 per 100,000.[9] Demographics of tuberculosis in district Mansehra also showed that most of the patients registered at the District Tuberculosis Control Office (DTO) were females (57%) as compared to males (43%).[10]

In our research work, most of the study population belonged to urban area i.e. 65.3%. This portrayal is alike to most countries with low-incidence and selected high-incidence countries.[11] Certain social conditions may have an effect on urban localities, for instance, homelessness or those conditions that make other residents prone to tuberculosis, like high population density and deteriorating public health infrastructures. Health facilities in city localities may be in somewhat easy range. In rural localities, patients have to move from far flung areas every so often. Another positive result was found in a study conducted in USA where frequency in big metropolises stayed greater than double, compared to what was stated for other areas of USA. Insistently, more frequency of TB in big cities was linked to presence of risk factors in people, for advancement to tuberculosis.[12]

Another finding portrayed by our investigation was site of tuberculosis where the most common site was extra pulmonary tuberculosis (48%). This is line with another research conducted in USA on extra pulmonary tuberculosis (EPTB) depicting that though there is a decline reported in the occurrence

of pulmonary tuberculosis in the U.S.A. but it has not been supplemented by a drop in prevalence rate of extra pulmonary tuberculosis.[13] So EPTB is contributing to the burden of infection and does not obtain explicit responsiveness in global control strategies resulting in certain diagnostic challenges. In Australia, EPTB counts for more than forty percent of cases and it turns to greater than 50%, if co-existing Pulmonary TB is also taken into consideration. These figures have been purportedly cumulating in Western countries & Australia. Moreover extra pulmonary tuberculosis manifests different presentations that renders it perplexing as for as diagnosis is concerned, quite often connected to delay in diagnosis, leading to higher possibility of severe disease and death, predominantly "TB meningitis".[14] From a public health standpoint, there is thus a necessity to address this set of patients, as they do add to the total problem of disease and they do have a substantial influence on available resources of national health systems.

In our study, a healthy finding was observed that the commonest treatment outcome was treatment completed (65.3%) followed by 21.3% of cured ones and treatment failure was very low (2.7%). It shows that national government is trying to fulfill its obligation for treating TB patients and to control the spread of the disease. Other contributory factors are political commitment by government, better-quality laboratory facilities, an uninterrupted provision of medicines, and a monitoring system for documentation & evaluation. Finally, the direct observation of treatment has resulted in effective treatment completion and cure rates. Similar results were found in a research conducted in Northwest Ethiopia where the outcomes were categorized as cured 19.9%, treatment completed 50.3%, lost to follow up 05%, treatment failure in 1.7% and died 0.6%.[15] Likely outcomes were seen in researches conducted at Bangalore with cure rate of 65.7%, and Tamil Nadu with cure rate of 75%. For purpose of understanding, WHO recommends to achieve "85% cure rate".[16] In contrast to our results, a study conducted at South Africa reported 30% of failed treatment, died and lost to follow up in their patients.[17] The core reason for the high failed treatment may be the non-compliance of the cases in the study settings. Therefore, frequency of failed treatment in TB cases having pulmonary disease, getting treatment at DOTS clinics differs from one place to another and reveals the level of threat posed to close contacts of the patients as well as development of multidrug-resistant TB.

It is clear in our findings that the overall success rate of outcome was 86.7% in the study participants which is quite satisfactory, though room for improvement is still there. The reason for reasonable success rate might be "Directly Observed Treatment Short Course (DOTS) strategy" that makes TB cases to ingest anti-TB medicines under the surveillance of liaison persons. Improved compliance to the treatment leads to better TB cure rate. Such outcomes were observed in a research conducted at Southern Ethiopia, where 85.2% "treatment success rate" was documented. The main reason behind this improved success rate may be the improved compliance of TB patients to the treatment in the study setting under "DOTS" which highlights the significance of the strategy.[18]

As this study has been conducted in a limited context of only one hospital setting so the results of this study are not generalizable.

Conclusion

Majority of the tuberculosis patients registered under directly observed treatment short course program at Holy Family Hospital, Rawalpindi had successful treatment outcomes. It is recommended that patients with unsuccessful treatment outcomes should be followed up for health education as well as treatment accordingly.

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