COMMUNITY BASED MANAGEMENT OF MULTI DRUG RESISTANT TUBERCULOSIS (MDR-TB) IN THE POPULATION OF KHYBER PAKHTUNKHWA

Mir Azam Khan*, Arshad Javiad**, Anila Basit**, Muhammad Atta-Ur-Raham Adnan*, Fahad Ahmad*, Noman Khan*, Afaq Khattak*, Hassan Sajjad*

*Peshawar Medical College, Peshawar, Pakistan
**Post Graduate Medical Institute, Lady Reading Hospital Peshawar, Pakistan

Address for correspodence:
Mir Azam Khan
Peshawar Medical College, Peshawar, Pakistan
E-mail:
khan.mirazam@gmail.com

ABSTRACT

Objectives: To assess the community mechanisms for treatment supervision, patient and treatment supporter education about MDR-TB

Methodology: All eligible MDR-TB patients enrolled at the study site from 1 January 2012 to 31 December 2012, and their treatment supporters included in the study. A self developed validated and reliable questionnaire in Pashto was used as a tool for evaluating the community mechanism for treatment supervision and patient's education about MDR-TB.

Results: Total 200 patients and treatment supporters included in the study. The majority patients were females (62.5%), aged 31-60 years (55%), married (53%) and living in mud houses (64%), whereas the majority treatment supporters were males (76%) and aged 31-60 years (55%).

Only 5% treatment supporter recorded their treatment. Side effects to the drugs were experienced by 43% patients, out of them only 67.7% informed their treatment supporter about the drugs side effects, and 91.67% were helped by informing the doctor. All treatment supporters kept record of the medicine intake by their patients, 89%) knew the type of TB their patients were suffering, 88% were personally supervising the intake of drugs to their patient, 63.6% said they do it twice a day and 57.5% responded correctly when asked about the dosage/number of drugs.

Conclusion: Gaps identified in treatment supervision need to be filled through systemic inputs in line with local context with special focus on identifying and enrolling educated treatment supporters. There is a need to standardize the treatment support process by developing a training curriculum and training the supporters.

Keywords: TB; MDR-TB; Community-based treatment; Program development

This article may be cited as: Khan MA, Javiad A, Basit A, Adnan MA, Ahmad F, Khan N, Khattak A, Sajjad H. Community Based Management of Multi Drug Resistant Tuberculosis (MDR-TB) in the Population of Khyber Pakhtunkhwa. Pak J Chest Med 2015; 21(4): 134-8

INTRODUCTION

Multidrug resistant tuberculosis (MDR-TB) defined as TB resistant to both isoniazid (INH) and rifampicin (RMP) poses significant threat to control of TB worldwide. Because of resistance to the two most effective anti-tuberculosis drugs (INH and RMP), treatment of MDR-TB patients with less potent, more toxic and costly second-line anti-TB drugs for prolonged time make it difficult to produce optimal treatment outcomes.[1,2] In 2013, there were an estimated 480,000 new cases of MDR-TB worldwide. Among them only 28.3% were notified and only 20.2% were started on treatment.[3] Rapid case detection, initiating treatment with quality assured second-line drugs (SLD), and the building of capacity to deliver treatment effectively is required to control this epidemic.[4] But unfortunately this has not occurred yet in MDR-TB 'High Burden Countries' (HBCs). The majority of programs for treating MDR-TB are specialized hospitals based ones.[5]

The advantage of this type of treatment is that patients can be continuously assessed for adverse drug

reaction and adherence to treatment. Besides this, respiratory isolation of patient till negative results of sputum smears is thought to prevent transmission of MDR organisms to others in the community. However, lengthy hospital stays account for a large proportion of the overall costs of treating patients with MDR-TB.[6,9] This results in treating only tens or hundreds of thousands of notified MDR-TB patients.[5] In addition, prolonged hospital stays can result in nosocomial transmission, thus count to the medical and financial burden of treating this disease. Most outbreaks of MDR tuberculosis in the world have been reported in hospitals.[10-12] In order to overcome these challenges and reduce the cost of treatment, community-based directly observed therapy (cb-DOTS) programs that utilize family members, neighbors, co-workers, local health care workers (HCWs) or former patients to directly observe treatment rather than requiring hospitalizations or frequent visits to a health care facility have been initiated.[13] Although several reports of community based treatment of patients with MDR tuberculosis have demonstrated encouraging results,[5,13-15] but they may be supposed as problematic because of recommendations for daily supervision and frequently multiple daily doses of medications.

Unfortunately, Pakistan is currently ranked 4th highest MDR-TB burden country, with an estimated 13,000 MDR-TB cases in 2013. Despite the high prevalence of MDR-TB in the country, only 11.5% of the estimated and 57.5% of the notified MDR-TB cases started treatment in 2103.[3]

Programmatic management of drug-resistant TB (PMDT) in Pakistan was initiated in June 2010, and 756 MDR-TB patients were enrolled for treatment in 2010–2011. Pulomonology department of Lady Reading Hospital, Peshawar was one the few sites where community based programmatic management of drug resistant TB were initiated in the country. Thus the present cross-sectional study was conducted with the aim to assess the community mechanisms for treatment supervision and patient education about MDR-TB.

METHODOLOGY

Study setting and design

This was a cross-sectional study conducted at PMDT-LRH Peshawar, Pakistan. All MDR-TB patients who were enrolled for treatment at the study site from 1 January 2012 to 31 December 2012, and their treatment supporters, who were able and willing to participate by giving written consent (oral in case of illiterate participants) were eligible for inclusion in the study. Convenience sampling method was adopted.

Data collection tool

A self developed valid and reliable questionnaire in Pashto (the mother tongue of the study population, the English version of the questionnaire is attached at the end) was used as a tool for evaluating the community mechanism for treatment supervision and patient's education about MDR-TB. Construct and content validity of the questionnaire was assessed by a panel of experts composed of a DR-TB clinician, a clinical pharmacist, and a statistician. Face validity of the questionnaire was established by giving it two groups of 10 participants each other than those enrolled in the study. Questionnaire was finalized after a series of discussion with the groups. Internal consistency of the tool assessed was assessed by Cronbach's alpha, that yielded good internal consistency of Cronbach's alpha= 0.808.

Tool administration

Questionnaire was administered to the patients who were eligible and willing to fill the questionnaire by themselves. While the rest were interviewed by the principal investigator and their responses were filled in the questionnaire.

RESULTS

A total of 200 patients and treatment supporters each were interviewed and included in the final analysis. Baseline socio-demographic characteristics of patients and their treatment supporters are given in table 1.

Patient's responses about MDR-TB and community mechanism:

All the patients had a mandatory treatment supporter and all of them were their family members. One hundred and forty four (72.0%) patients replied that they were the only patient being supervised by their treatment supporter, while 56 (28.0%) said they were also supervising other patients. Majority patients (55.5%) were receiving treatment for 0-12 months and they have been under supervision for same duration, while 89 (44.5%) have been on treatment for 12-24 months and supervised for same time.

Ten (5.0%) patients said that their treatment supporter records their treatment, while 163 (81.5%) said that they do not and 17 (8.5%) said they were not sure. One hundred and twenty (64.5%) patients said they were receiving injectables as treatment, while 71(35.5%) were not. Of those receiving injectables 19 (14.72%) replied that their treatment supporter gives the injection, while 110 (55.0%) said that it was done by other's i.e. Doctors in the Basic Health Unit or a health worker in the village.

One hundred and twenty nine (64.5%) patients said that their supporters were familiar with the drugs that

Table 1: Baseline Characteristics of the study cases

Patient socio-demographic characteristics		Treatment supporter socio-demographic characteristics	
Variable	**No (%)**	**Variable**	**No (%)**
Gender		**Gender**	
Male	75 (37.5)	Male	152 (76)
Female	125 (62.5)	Female	48 (34)
Age (years)		**Age** (years)	
13-30	88 (44)	17-30	90 (45)
31-60	110 (55)	31-60	110 (55)
>60	2 (1)	>60	-
Marital status			
Unmarried	89 (44.5)		
Married	106 (53)	-	-
Widow	4 (2)		
Housing			
Muddy	128 (64)		
Concrete	72 (36)	-	-

are used for their treatment, while 39 (19.5%) said they were not and 32 (16.0%) answered as not sure. Eighty six (43.0%) patients said that they were having side effects to the drugs they were receiving while 114 (57.0%) had no such problems. Out of those 86 patients 84 (97.67%) inform their treatment supporter about their side effects, while 2 (2.32%) did not and 77 (91.67%) said that they helped them by informing the doctor about their problems, while 7 (8.34%) replied that they did not do much. Out of all 174 (87.0%) patients said that their treatment supporter accompany them on their follow up visit to the MDR-TB clinic, whereas 26 (13.0%) did not.

Two hundred treatment supporters were also interviewed. All treatment supporters were related to the patient as family members i.e. father, mother, brother, husband and wife. Majority (89%) were well aware of what problem their patient was suffering from as they were asked to describe in simple words what form of TB their patients were encountering, and all of them answered "it is the one which has 2 year of treatment" whereas 22(11%) do not know about the disease. All the treatment supporters replied that their patients are regular treatment and 176 (88%) said they personally supervise the intake of drugs to their patient and 24(12%) do not. 50 (28%) said they do it on daily basis, 112(63.6%) said they do it twice a day, while 12(6.81%) do it on alternate days and 2 (1.1%) once a week.

One hundred and fifteen (57.5%) treatment supporters responded correctly when asked about the dosage/number of drugs given the patient every day, 55(27.5%) responded with partially correct answers, while 30 (15.0%) replied incorrectly.

All treatment supporters said that they keep a record of the medicine intake by the patient and they all have the same unique way of doing it by counting the number of tablets for each day and it's supplies finishing within a month, and ticking the patients treatment card for daily administered medicine. One hundred and thirty (65%) supporters said that their patients had not suffered any side effects of the treatment, while 70 (35%) said their patients do suffer from some kind of side effects. The supporters whom patients encountered side effects were further asked about their response for helop. Sixty one (87.1%) said they took them to do the doctor, while 9 (12.9%) said they did nothing but reassured the patient that it was due to the drugs they are taking. One hundred and seventy five (87.5%) supporter said they always accompany the patient to every follow up at MDR-TB OPD clinic, while 25(12.5%) said they do not. Majority (89.5%) supervisors said that they only supervise one patient, while 21(10.5%) said they supervise more than one.

DISCUSSION

Community based management is an evolving mechanism for MDR-TB treatment supervision. This system is so far being used in a handful of countries in the world and Pakistan is one of them. The questionnaire we designed was to see if this system is proving beneficial and better than hospitalized management. The alarming results that we found were that all patients' treatment supporters were their family

members, who were mostly uneducated. We were expecting that a village health worker would take these duties but it was not the case. We can also make the conclusion from our results that MDR-TB is a disease of poor as 64% of patients were living in mud house and of those many lived in combined family system with an overcrowded swamped house, making it perfect breeding ground for MDR-TB.

According to WHO standards one supporter, should be looking after only one MDR-TB patient for his/her treatment span and this was followed by 72% of the supporters. All the patients reiterated that their supporters take full care of their treatment and 98.85% said they do it at least once a day supervision. Out of 200 patients only 86 (43.0%)_complained of having side effects that were gastrointestinal disorders, ototoxicity, psychiatric disorders etc, that were in accordance with MDR-TB treatment. Majority (87%) patients said that their treatment supporters accompany them on their follow up visit to the MDR-TB clinic, and this was evident to us when we were interviewing the patients and their supervisor. Only few (5%) patients said that their supporters records their treatment, while 163 (81.5%) said that they do not and 17 (8.5%) that they were not sure. Low or poor documentation of the treatment support is largely due to reliance on family members as treatment supporters who are mostly illiterate and are also not accountable to health system.

The responses we received from the treatment supporter were mostly in accordance with what the patients provided. Out of 200 supporters, 152 (76.0%) were male and all the treatment supporters were family member's i.e. father, mother, brother, husband and wife. The most encouraging thing that we noticed while interviewing the treatment supporter was that all of them were aware of what problem there patient was having and what kind of side effects they could encounter with the treatment. The credit for this can be given to the PMDT-LRH team at the study site which trains these supporters before the treatment of their respective patients begins and they make sure they are educated about MDR-TB in detail. A result that was not proportionate was when we asked the supporters that do they keep a record of their patient treatment so all of them said that they keep a record of the medicine intake by the patient and they all have the same unique way of doing it by counting the number of tablets for each day and it's supplies finishing within a month, so that keeps them in track. Beside this they also said that they tick the patient's treatment card for daily drug administration. On other hand when the patient was asked the same question, only 5% patients said that their supervisor records their treatment, while 81.5% said that they do not and 8.5% said they were not sure. This discrepancy regarding treatment supervision between patients and their treatment supervisors should be taken into consideration by the people training these supervisors.

CONCLUSION

MDR-TB requires a strong community mechanism for treatment supervision. A very professional initiation of therapy can't be sustained if the supervision mechanisms are weak or the treatment supervisors aren't formally trained and accountable. Problems in treatment adherence among the cohort can't address well without support from a strong community component for treatment supervision.

Gaps identified in treatment supervision need to be filled through systemic inputs in line with local context with special focus on identifying and enrolling educated treatment supporters. There is a need to standardize the treatment support process by developing a training curriculum and training the supporters. Community health workers in terms of lady health workers, outreach workers, male and female paramedics need to be made part of the community support process with clear roles and responsibilities. The strategy is expected to improve the support process in terms of skilled supervision and appropriate documentation of the MDR treatment supervision at community level with accountability as inbuilt part.

REFERENCES

1. Ahmad N, Javaid A, Basit A, Afridi AK, Khan MA, Ahmad I, et al. Management and treatment outcomes of MDR-TB: results from a setting with high rates of drug resistance. International Journal of Tuberculosis and Lung Diseases 2015; 19(9):1109-14.

2. Basit A, Ahmad N, Khan AH, Javaid A, Sulaiman SAS, Afridi AK, et al. Predictors of two months culture conversion in multidrug-resistant tuberculosis: findings from a retrospective cohort study. PloS One 2014; 9(4):e93206.

3. WHO. Global Tuberculosis Report 2014: World Health Organization; 2014.

4. Keshavjee S, Gelmanova IY, Farmer PE, Mishustin SP, Strelis AK, Andreev YG, et al. Treatment of extensively drug-resistant tuberculosis in Tomsk, Russia: a retrospective cohort study. The Lancet 2008; 372(9647):1403-9.

5. Cox H, Hughes J, Daniels J, Azevedo V, McDermid C, Poolman M, et al. Community-based treatment of drug-resistant tuberculosis in Khayelitsha,

South Africa. The International Journal of Tuberculosis and Lung Disease 2014; 18(4):441-8.

6. Geerligs W, Van Altena R, De Lange W, Van Soolingen D, Van Der Werf T. Multidrug-resistant tuberculosis: long-term treatment outcome in the Netherlands. The International Journal of Tuberculosis and Lung Disease 2000;4(8):758-64.
7. Mahmoudi A, Iseman MD. Pitfalls in the care of patients with tuberculosis: common errors and their association with the acquisition of drug resistance. Jama 1993; 270(1):65-8.
8. Rajbhandary S, Marks S, Bock N. Costs of patients hospitalized for multidrug-resistant tuberculosis. The International Journal of Tuberculosis and Lung Disease 2004; 8(8):1012-6.
9. Burman WJ, Dalton CB, Cohn DL, Butler JR, Reves RR. A cost-effectiveness analysis of directly observed therapy vs self-administered therapy for treatment of tuberculosis. CHEST Journal 1997; 112(1):63-70.
10. Frieden TR, Sherman LF, Maw KL, Fujiwara PI, Crawford JT, Nivin B, et al. A multi-institutional outbreak of highly drug-resistant tuberculosis: epidemiology and clinical outcomes. Jama 1996; 276(15):1229-35.
11. Ritacco V, Di Lonardo M, Reniero A, Ambroggi M, Barrera L, Dambrosi A, et al. Nosocomial spread of human immunodeficiency virus-related multidrug-resistant tuberculosis in Buenos Aires. Journal of Infectious Diseases 1997; 176(3):637-42.
12. Moss A, Alland D, Telzak E, Hewlett Jr D, Sharp V, Chiliade P, et al. A city-wide outbreak of a multiple-drug-resistant strain of Mycobacterium tuberculosis in New York. The International Journal of Tuberculosis and Lung Disease 1997; 1(2):115-21.
13. Mitnick C, Bayona J, Palacios E, Shin S, Furin J, Alcántara F, et al. Community-based therapy for multidrug-resistant tuberculosis in Lima, Peru. New England Journal of Medicine 2003; 348(2):119-28.
14. Shin S, Furin J, Bayona J, Mate K, Kim JY, Farmer P. Community-based treatment of multidrug-resistant tuberculosis in Lima, Peru: 7 years of experience. Social science & medicine 2004; 59(7):1529-39.
15. Brust JC, Shah NS, Scott M, Chaiyachati K, Lygizos M, van der Merwe TL, et al. Integrated, home-based treatment for MDR-TB and HIV in rural South Africa: an alternate model of care. The International Journal of Tuberculosis and Lung Disease 2012; 16(8):998.