APRIL - JUNE 2012

MEDICAL CHANNEL

Original Article

PATIENT CENTERED TREATMENT OF TUBERCULOSIS UNDER PROGRAMMATIC CONDITION

1. **MUHAMMAD FAROOQ**
2. **BADAR ABBASI**
3. **ARSHAD ALI**

1. ***Assistant Professor***
   Department of Medicine
   Smbbmc & Sindh Govt. Lyari General Hospital Karachi
   (Ex Assistant Prof. Sir Syed Medical College And Hospital)
2. ***Professor***
   Department Of Medicine
   Smbbmc & Sindh Govt. Lyari General Hospital Karachi
3. ***Assistant Professor***
   Department Of Medicine
   Smbbmc & Sindh Govt. Lyari General Hospital Karachi

Correspondence Address:
DR. MUHAMMAD FAROOQ
D1, Umer Manzil Opp.madina Masjid, Punjabi Club Kharadar, Karachi.
Mob # 03002175544
drdhedhi@hotmail.com

ABSTRACT

Objectives: To assess success rate and default rate of patient centered treatment of tuberculosis under programmatic condition and compare with DOTS strategy of treatment of tuberculosis.

Introduction: Tuberculosis is a common problem in Pakistan and most of the patients are from low socio-economical group. The facility of health care is poor and most of the patients are not getting chance to visit health care facility on daily basis. The strategy of DOTS needs daily observation of therapy for tuberculosis which is difficult for most of the patients. There was trial of Patient Centered treatment done successfully in Tanzania with good success results comparable to DOTS. The idea was taken from that study and the choice was given to the patients to visit health care facility on daily basis or taking home medications with treatment supporter of their choice.

Material and Method: This prospective cohort hospital based study was conducted in two teaching hospitals of Karachi. The total numbers of patient were 456. The patients with multi drug resistant tuberculosis (MDR) or patients who were transferred out were excluded. The choice of treatment supporter was given to the patient either they can have the option of the treatment support by health worker or family member. Almost all patients had taken the choice of home treatment with monthly delivery and treatment supported by their family members. The data was taken on Performa with signs, symptoms and laboratory investigations. The data was analyzed, and treatment outcome was presented according to WHO definitions.

Result: Out of 456 patients, 351 patients were compliant to the treatment and102 patients were default. The mortality rate was 0.66% (n=3). The success rate was 77.34% and default rate was 22%.

Conclusion: The success rate in our study was not same as WHO target for DOTS strategy but it was better than the other study conducted in same population under DOTS strategy. The study concluded that patient centered treatment of tuberculosis patient is an alternate option for those patients who cannot visit there health care facility on daily basis.

Keywords: Patient centered treatment (PTC); Tuberculosis in Pakistan; DOTS strategy

INTRODUCTION

Tuberculosis is a major public health problem in Pakistan and almost 280,000 patients reported every year.[1]According to WHO, our country ranks fifth among the 22 countries, which have high burden to tuberculosis. This contribute 43% of disease burden in Eastern Mediterranean Region.[2]

Tuberculosis was declared as global emergency in the year 1993 by WHO and DOTS strategy was believed to be the most effective measure to control tuberculosis.[3] Therefore, DOTs (Directly Observed Treatment Short course) strategy was adopted by many countries including India and Pakistan.[4]

As the treatment of tuberculosis was considered as the most effective intervention in

health care by World Bank, they funded on DOTS programme.[5]The DOTS strategy is considered as the cornerstone of global efforts at tuberculosis control.[6] The goal of DOTS is not only to decrease the incidence and treatment of affected patients but also to reduce the chances of developing resistance to primary treatment drugs.[7]

The World Health Assembly, in1991, targeted the cure rate more than 85% for newly detected smear positive pulmonary tuberculosis cases.[8]

A total number of 187 countries implemented DOTSin the year 2005 and 49 million cases of tuberculosis were treated under DOTS strategy in the same year.

In 2004 WHO reported that 84% of new patients registered with DOTS were successfully treated.[9]

Despite these results and achievement of goal with DOTS strategy, the incidence of tuberculosis is increasing specially in developing countries.[10, 11]

The precise definitions of categories and outcomes of tuberculosis are recognized by WHO.[12]In Pakistan the treatment of tuberculosis is for 8 month according to national guidelines. This includes 2 month intensive phase containing the drug Rifampicin, which is directly observed by health professional.

Under the circumstances of poor health care facility, distance to treatment center and poor financial resources the daily observation is difficult.

In Tanzania the health facility had the same problem and they introduced patient centered treatment with treatment supporter who were family members. This study from Tanzania revealed the same results as mentioned by DOTS programme.[13]

Some of the studies revealed that the results of treatment of tuberculosis outside the health care facility were similar to the results of DOTS strategy with health care facility.[14,15]

The study from Nepal shows that DOTS at health care facility and DOTS by family members achieved same success rates as the international target of 85%.[16]

The concept of patient centered treatment with treatment of tuberculosis supervised by family members was implemented and accepted by patients and health care professionals in Tanzania. This strategy was seen to have a positive impact on compliance of therapy.[17]

In patient centered treatment (PCT) the choice was given to the patient to select their treatment supporter, who may be health worker, neighbor, or family member of the patient. The goal of our study was to evaluate the success rate and default rate in PCT under programmatic condition which can be compared to international success rate of DOTs strategy.

MATERIAL AND METHOD:

The design of study was prospective cohort hospital based study. It was conducted in Sir Syed Hospital Karachi and Sindh Govt. Lyari General Hospital Karachi, for the duration of five years from 2006 to 2010. These are two teaching hospitals of Karachi having the burden of tuberculosis. The ratio of the patients from selected from both the hospitals was 50%.

In our study total 456 patients were included who were diagnosed as cases of tuberculosis on the basis of clinical, radiological, histopathological or laboratory evidences. The patient who were transferred out and outcome was lost were excluded in the study. The patients diagnosed as cases of MDR (multi drug resistance) were also excluded. All the cases of tuberculosis whether pulmonary or extra pulmonary went through certain investigations like sputum smear for AFB, CBC, ESR and X-ray chest P.A. view.

The sputum examination was done for acid fast bacilli in Sir Syed Clinical Laboratory, and laboratory in Lyari General Hospital, with Ziehl-Nielsen technique.

The total three sample were taken at day zero, one sample after two months of treatment (after 3 months in Cat II), and the last sample at end of seven month of treatment according to recommendations of WHO.[18, 19]

Those who were sputum smear positive for AFB in two or more smear or one smear positive with clinical and radiological features of tuberculosis were labeled as smear positive pulmonary tuberculosis. On other way those who were sputum smear negative for AFB with clinical features and radiological evidence of pulmonary tuberculosis were labeled as smear negative pulmonary tuberculosis. For diagnosis of extra pulmonary tuberculosis the clinical parameters, laboratory data and/or histopathological evidences were established. All the case were categorized into Category I and Category II according to WHO classification.[12] They were further divided into pulmonary smear positive, pulmonary smear negative and extra pulmonary cases.

The treatment was given according to guidelines of National TB Program for eight month. For Cat I, two month intensive phase which include rifampicin, isoniazid, ethumbutol and pyrazinamide and six month continuous phase which include isoniazid and ethumbutol. For Cat II, two month five drugs all four of Cat I and streptomycin and for next one month four drugs therapy as in Cat I and five month continuous phase include isoniazid, ethumbutol and rifampicin.

In our study the choice of treatment supporter was given to the patient and almost all patients preferred home treatment with family member as treatment supporters, so the therapy was given for one month and follow up was taken every month. The telephone calls were given for those patients who were unable to come on next appointment and this increase compliance in successive years. The cure was declared for those who were smear positive pulmonary tuberculosis initially and became smear negative for AFB at end of seven month of treatment. The treatment complete was labeled to those who completed their treatment of eight months and clinically improved. These include all extra pulmonary cases, all smear negative pulmonary cases and those smear positive pulmonary cases that could not perform sputum smear test at end of seven month. The success was labeled for those who got cure or completed their therapy.

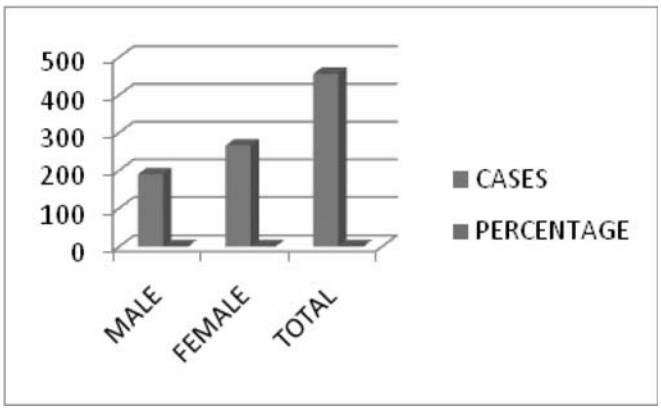
The data was taken in a Performa with variable of gender, age, residence (urban or rural), distance from treatment center (less than 10 km or more than 10 km), education (literate or illiterate), job status, income (rupees less than 5000/m, 5000-10000/m or above 10000/m), and family size (less than 5 or 5 & above).

The clinical features of pulmonary or extra pulmonary tuberculosis were taken, the laboratory data of base line and end of seven month therapy sputum smear results were taken in Performa. The outcome was recorded according to WHO guidelines. The data was analyze by using software SPSS v 13 and results were statistically analyzed by chi square, determine the p value were $p < 0.05$ was considered significant.

RESULTS:

The total number of registered case after excluding MDR and transfer out were 456, out of which 266 were female and the ratio

CHART 1:
DISTRIBUTION OF GENDER



between female and male was 1.4:1 (chart 1).The age distribution revealed that the most of the patients (85%) were in age group between 15 years to 54 years (table 1). The 399 cases (87.50%) were new cases and classified in Category I, on contrary 57 (12.50%) cases were retreated classified as Category II (chart 2). The total numbers of smear positive pulmonary tuberculosis were 153(33.50%), smear negative pulmonary tuberculosis were 203 (44.50%) and extra pulmonary were 100 (22%) (Table 2).The year wise case registration in given in table 2, which revealed small number of cases at the beginning of program (2006) and maximum number of cases in last study year (2010).

The result of outcome is shown in table 3. The outcome is divided into cure, complete course, default and death. No one of the case had treatment failure and those who were transferred out were excluded initially in the study. In total 153 cases that were smear positive initially 112 cases turned out smear negative at the end

TABLE 1:

AGE DISTRIBUTION

YEAR	AGE LESS THAN 25Y	AGE 25-54Y	AGE ABOV 54Y	TOTAL
2006	7	12	5	24
2007	40	45	11	96
2008	41	49	20	110
2009	45	46	18	109
2010	37	68	12	117
TOTAL	170	220	66	456

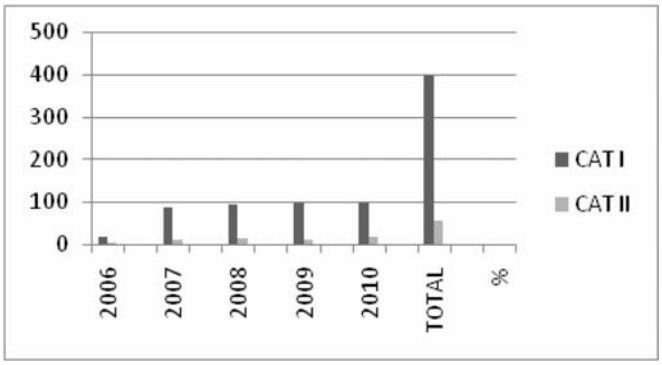
		Frequency	Percent	Valid Percent
Valid	more than 54 years	66	14.5	14.5
	25 to 54 years	220	48.2	48.2
	15 to 24 years	170	37.3	37.3
	Total	456	100.0	100.0
N	Valid	456		
	Missing	0		
	Std. Deviation	.683		

TABLE 2:

THE CATEGORIES AND TYPES OF TUBERCULOSIS

YEAR	CAT I	CAT II	SMEAR + VE	SMEAR -VE	EXTRAPULMONARY	TOTAL
2006	20	4	9	9	6	24
2007	87	9	30	48	18	96
2008	95	15	33	52	25	110
2009	98	11	35	50	24	109
2010	99	18	46	44	27	117
TOTAL	399	57	153	203	100	456
%	87.50%	12.50%	33.50%	44.50%	22%	100%

CHART 2:
CATEGORY DISTRIBUTION



of 7th month treatment. So the cure rate was 73.20% overall. The year wise distribution of cure rate is given in table 3. Which reveals cure rate was increase after 2006.

The total 239 cases completed their treatment. In this outcome all those patients who were either smear negative or extra pulmonary completed their therapy were included as well as those smear positive who were completed the therapy but sputum was not done at end of 7th month. The success rate was included number of cases cured and number of cases completed their therapy. The overall success rate was 77% (351 cases). They success rate year wise are shown in table 4. The patients who defaulted during the treatment were 102 (22%). The year wise rate of default is shown in table 3, which is showing the default rate was decreased with successive years of treatment. In our study only three patients were died and death rate was 0.66% overall.

TABLE 3:

THE OUTCOME OF PCT

YEAR	CURE	COMPLETE	DEFAULT	DEATH	TOTAL
2006	3	10	10	1	24
2007	23	43	28	2	96
2008	24	57	29	0	110
2009	29	57	23	0	109
2010	33	72	12	0	117
TOTAL	112	239	102	3	456

TABLE 4:

YEAR WISE CURE, SUCCESS, DEFAULT AND DEATH RATE

YEAR	CURE RATE	SUCCESS RATE	DEFAULT RATE CURE+COMPLETE	DEATH RATE
2006	33.33%	54%	42%	4.10%
2007	79.31%	69%	29.16%	2%
2008	72.72%	73.63%	26.36%	0
2009	80.55%	78.89%	21.10%	0
2010	71.73%	89.74%	10.25%	0
TOTAL	73.20%	77%	22%	0.66%

DISCUSSION:

The success rate in outpatient centered treatment study was 77.34% which is less than the 85% success rate as goal of WHO TB control program.[18,20] It is also not coinciding with the national figure of success rate in Pakistan[21] and other regional countries[22], but it is better than the study conducted in same region of Pakistan which reported 75% success rate under DOTS strategy.[23] Our success rate is also better than other studies conducted in Malaysia[24] and in other areas of Pakistan.[25]

The total number of smear positive cases were 153 patients (33.50%) which is in contrast to study by Shargie (63%) [26] and other study conducted in Pakistan (61.77%).[23] The cure rate in our study was 73.20% compared to 71.30% in a study conducted in same region under DOTS strategy.[23] The treatment success in the entire PCT cohort was more better than DOTS strategy in Tanzania.[13]

The default rate in our study was 22% as overall, which was decreasing in from 2006(42%) to 2010(10.2%).The default rate in our study is comparable with Shargie 20% [27] and Ishaq 16.2%.[23] Our default rate was lower than study conducted in Malaysia[24]

but higher than default rates in India (5%), Bangladesh (4%), Sri Lanka (5%), and in Indonesia (2%).[22] The default in our study, which was higher initially, decreased in successive years from 2006 to 2010 due to effect of counseling of patients and their family members as well as positive behavior of health care professional towards patient centered treatment. In our study the case fatality rate was 0.66% which is lower than National figure (13%) and figures from India (5%), Bangladesh (4%), Sri Lanka (5%) and Indonesia (2%).[22] This mortality rate is also lower than study done in Pakistan (7.5%).[23] The reason of low mortality in our study might be due to young age presentation (85% young age group) and lack of complications and co morbidities.

These finding in our studies are similar to other studies done in variety of settings. For example in Nepal, a randomized trial revealed 89% success rate in the patients who had their treatment under observation of their family members compared to 85% success rate in patients supervised by community health worker. The treatment supervised by family member had higher success rate than the targeted success rate by WHO (85%).[16] In a study from Thailand ninety percent of the patients treated with observation by their family members and only ten percent of the patients were observed by health staff. The success rate was found to be higher in patients observed by family members (87%) compared to observed by health staff (76%).[28] A randomized trial done in Pakistan did not find any difference in treatment success rate in patients observed by family members (62%), observed at health facility (67%) or self-administered (62%).[25]

Similar findings were seen in a study from Swaziland, which reported that the success rate in patients observed by family members was 66% and patients observed by community health worker were68%.[15]

These studies and our study show the results are almost similar in patients observed by family members compared to DOTS strategy when observation is needed by health worker, but the ultimate proof of home bases treatment with family member as treatment supporter is not established. Therefore, the concept of treatment observation by family members is still not accepted within the TB community. The WHO treatment guidelines state that family members should not be considered as treatment supporters.[29] However, in patients who are co-infected with HIV the treatment support for tuberculosis by family members is explained in the updated guidelines on community involvement in TB care.[30] There is a shift towards the idea that there is a need to give the option to the patient to select treatment supporter of his own choice.

There are several objections which have been raised against the use of family members as treatment supporters. The first objection is that family members are not firm on treatment intake, especially if the patient develops side effects.[31] The second objection is that these studies showing similar outcome as DOTS are designed with multiple intervention like monitoring, supervision and training.

In the study from Nepal, the research staff was doing frequent visits to the home of patients to monitor therapy if it was given regularly or not.[16] In the study from Thailand, the health workers were involved in the identification of a treatment supporter and special arrangement were done to facilitate treatment delivery at home.[28] In the study from Senegal, there was training program for treatment supporters to improve compliance of the patients.[32] The third objection against the family members as treatment supporter is that most of the time the patients are allowed to take therapy by themselves, so, it became self-administered treatment. This was shown in a study from Thailand, where 11% of the patients had self-administration of treatment, compared to 23% of patients had community members as treatment supporters and 35% of patients had family members as treatment supporters.[33] There was controversy that family members should or should not be treatment supporters. This controversy was discussed by Macq JC that the DOTS strategy needs exploration and there is need of change from uniform to customized approach. The acceptability and feasibility of treatment observation strategies are specific to the context.[34]

In Tanzania, home-based treatment observation by a supporter of choice was accepted and did not lead to an increase in unfavorable treatment outcomes compared to conventional treatment delivery strategies. It decreases the physical strain on the patients to visit health care facility for their daily DOTS and allowed the patients to take rest or to do their jobs. This not only reduces the cost of travel but also decreases the burden on health care facilities.[17] In decentralized settings where implementation of DOTS is difficult due to poor health care facilities the compliance of therapy was seen as same as treatment under supervision of health care facilities.[35,36]

The result of social study done in Pakistan for compliance to DOTS also concluded that direct observation, especially at health facilities, is inconvenient and costly for patients. So there is a need to search out the way of supervision to increase compliance to the therapy without having any burden to the patient or health care facility.[37] Community treatment supporters may be appreciated to give wider support to the patients. However, great care should be taken in dialogue with the patient to select a treatment supporter who is accessible, acceptable, reliable and concerned to support the completion to treatment. The patient centered treatment of tuberculosis with family member as treatment supporter is a good option and should be considered.

CONCLUSION:

This study concluded that patient centered treatment (PTC) under programmatic condition is an alternate and better option for the patients who cannot get the facility to visit treatment center on daily basis. This also emphasize that there should be patient friendly DOTS approach in tuberculosis control program. This conclusion is almost same as the results of other related studies that have been carried out to date by Floyd[38] and Wilkinson D.[39] Also, the conclusion of our study is matching with trends towards more emphasis on patient friendly care and flexibility in DOTS approaches at WHO Geneva.[29]

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