TREATMENT OUTCOME OF PULMONARY TUBERCULOSIS UNDER OBSERVATIONAL THERAPY: AT DISTRICT SWAT, KPK, PAKISTAN

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ABSTRACT

Background & Objective: The treatment of tuberculosis is cheap and highly effective, yet world wide the disease remains a serious cause of illness and death. That's why WHO has called for the universal adaptation of DOTS (Directly observe treatment short course). The aim of this study was to analyze the effectiveness of DOTS in term of cure and treatment completion rates among pulmonary tuberculoses patients at District Swat, after the implication of DOTS.

Methods: 167 male and female pulmonary tuberculosis patients age more than 15 years were enrolled for the third quarter of 2002 (July to September) and were assessed on the basis of history chest X-ray, sputum smear microscopy and culture.

Results: Out of 167 patients, 108(65%) were sputum smear positive by direct microscopy and 59(35%) were sputum smear negative patients confirmed on clinical grounds. The treatment outcome was calculated 12-15 months later. The outcome was 53% cured, 34% completed, 1% died, 9% defaulted, 0% failed and 3% transferred out. Notification rate was 152/100,000 population and case detection rate was 65% in pulmonary tuberculosis patients. Cure rates among the groups of supporters as by family members were 78% and 68% by Lady Health Workers.

Conclusion: To achieve the target of 70% case detection and 85% treatment success, the health education promotion, fully involvement of lady health workers in the program and training in DOTS of care providers with flexible DOTS (individualized as necessary) component of observation with in the socio-cultural and local circumstances are the needs of the future program.

Key words: DOTS, Swat, Kyber Pakhtonkhwa, Pakistan

INTRODUCTION

Tuberculosis (TB) remains the world leading infectious cause of adult death in less developed countries, most of which are not due to MDR TB but to lake of access to effective treatment for drug susceptible tuberculosis[1].

After two decades of neglect by the international community, tuberculosis was again recognized as a major global health problem in the late 1980s[2]. The most recent global burden of disease shows that tuberculosis makes up 2.6 percent of burden in middle and low-income countries, making it the ninth leading cause of death and disability worldwide. The World Health Organization (WHO) estimates that 1.6 million people died of tuberculosis in 2005, of whom 190 000 were HIV positive[3]. In part because of the powerful interaction between HIV and tuberculosis, global tuberculosis incidence is estimated to be rising[4]. Surveillance data suggest that multi-drug resistance (MDR) is significant in several countries with the highest burden of tuberculosis[5] and recent reports of highly lethal strains of extensively drug-resistant tuberculosis[6] highlight the potential threat of expanding resistance.

There are 33 million cases of TB worldwide, 3 million annual deaths and 8 million new cases. About 0.3 million persons developed active TB every year ¾ of which concentrated of productive age group[7]. In some studies biological and social factors like poverty, children, family, homes, cattle and substantial stigma especially in women was

responsible[8].

WHO recognized DOTS (Direct observed Treatment Short course) and recommended that no rifampicin containing TB treatment should be given without direct observation [(9).]

WHO estimated that 89 percent of the world's populations would have been covered by DOTS by the end of 2005[3]. WHO has evaluated the performance of DOTS in the course of specific studies[10,11] as well as detailed annual reports since 1997[3,12,13].

Studies show DOTS to be successful in China, Bangladesh and Peru[14]. Pakistan adopted this strategy in 1995 and expansion begun in 2000 by the help of World Bank aid. Coverage was 15% in 2001 and 25% in 2002[15]. By end 2002, DOTS is covering 70% of the global population [10]. In 2001 for example, it was 82% in DOTS areas while it was only 40% in non-DOTS areas. "DOTS is the best approach we have[16] to ensure patients' adherence.

In district Swat DOTS introduced in 1995 and expansion begun 2001 with the involvement of Lady Health Workers and Community members as well as trained Laboratory technicians in microscopy[9]. Now the coverage of DOT in this district is about 80%.

MATERIALS AND METHODS

Three diagnostic centers of well populated area were selected for the study. They are TB Center Saidu Sharif Teaching Hospital Swat, Civil Hospital Khwazakhela and THQ Hospital Matta Swat. Patients with TB symptoms who submitted three sputum specimens were included in this the study. Sputum samples for AFB were examined by Zeihl Nelson (Z.N) staining direct microscopy. Cases remained sputum smear negative (SSN) on direct microscop proceeded by concentration method.

Samples were decontaminated by NALC NaOH and homogenized by standard modified Petrof method, after centrifugation the sediments used for microscopy. For further confirmation of remaining smears negative sputum, culturing on Lowen Stien Jonson (L.J) Slant were done by inoculating 0.1 ml Concentrated Specimen, each inoculated test tube incubated at 37 C in a slanted position to ensure even distribution of inoculums and then with weekly intervals of 3 to 4 weeks culture were examined and growth was confirmed by Z.N staining. Patient's diagnosis were confirmed by sputum smear microscopy and then enrolled in DOTS.

Before enrollment, patients were educated about TB, the importance of completing treatment, the purpose and process of enrollment and side effects of drugs. Each patient was evaluated completely for 8 months treatment duration and results were analyzed after 12-15 months.

As a whole in the assessment major helps were taken by Lady Health Workers of the area, family members of the patients, recorded prescribed instruments (Cards and Registers) of DOTS program and Laboratory Technicians of the facilities. During this period patients were advised for sputum microscopy at least for 03 occasions and regular visits of the facilities.

RESULTS

Of the 167 patients 110(66%) were females and 57(34%) were males. Age and sex wise distribution has shown in the graph. The diseases affecties were young adults mostly of reproductive age.

Table:1. Age and Sex wise distribution of Pulmonary TB Patients.

Age groups (Years)	Male 57 (34%)	Female 110 (66%)
15-24	19 (11%)	52 (31%)
25-34	15 (09%)	27 (16%)
35-44	10 (06%)	18 (11%)
45-54	07 (04%)	10 (06)%
65-64	06 (04%)	03 (02%)

108 (65%) sputum were smear positive by Ziehl Nelson stain direct microscopy and 59 (35%) gave negative results (sputum smear negative).Out of 59 SSN cases 20 were confirmed by concentration method. Remaining 39 SSN sputum's were preceded for culturing on LJ media. Which gave positive growth confirmed by ZN staining microscopy (not DOTS protocol, as well as it does not affect the result).

Treatment supporter for 88 patients were lady health workers, for 09 family members, 08 by hospital staff and 62 patients were interviewed as they were self administered.

Table: 2. Treatment supporter's contribution

Treatment Supporter	N=167	%
1. Lady Health Workers	88	53%
2. Self administered	62	37%
3. Family members	09	05%
4. Hospital Staff	08	05%

Treatment outcome among groups of supporter show significance differences between cure rates for self administered patient and those who were supervised. Among the groups family members were with high score of 78%, then 68% lady health workers, but defaulters were 21% with highest score in self administered patient which is the matter of serious discussion, as shown in the graph.

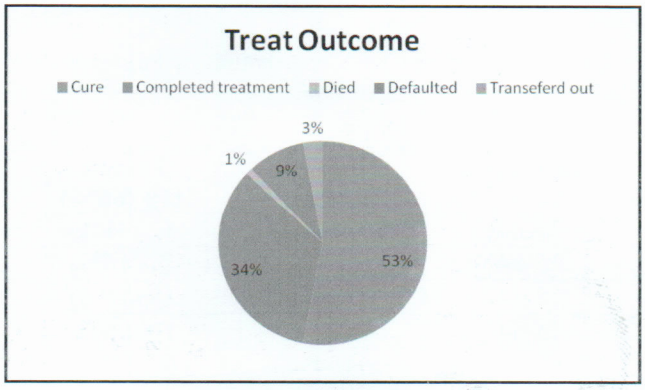


Table: 3. Treatment outcome among groups of supporter

Out Come	Lady Health Worker n (88)	Hospital Staff n(8)	Family members(9)	Self administered(62)
Cured	60 (68%)	2 (25%)	7 (78%)	20 (32%)
Completed	24 (27%)	5 (63%)	1(11%)	26 (42%)
Failured	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Defaulted	1 (1.5%)	0 (0%)	0 (0%)	13 (21%)
Died	1 (1.5%)	0 (0%)	0 (0%)	2 (3%)
Transferred out	2 (2%)	1(12%)	1(11%)	1(2%)

The overall treatment outcome according to the study was 89 (53%) patients were cured, 56 (34%) completed treatment and 15, (9%) defaulted as shown in the table.

Table 4: Overall treatment out comes among registered patient

Out Come	N=167	Percentage
Cured	89	53%
Completed	56	34%
Failured	0	0%
Defaulted	14	09%
Died	03	01%
Transferred out	05	03%

DISCUSSION

Pakistan ranks eight among the 22 high burden countries in the world and the emergence of multidrug resistant (MDR) TB and HIV co infection is a growing concern the priority of DOTS is to detect Sputum positive cases, to treat them in order to prevent the transmission of the diseases[1]. Historically TB is regarded as a disease that effect the younger, poor, adults and the top killer of reproductive age in developing countries[17], mostly Asia Pacific region[18]. The same were confirmed by the present study as 15-35 years aged male and female were effected, in majority of these (65%) belong to suburban areas of District Swat.

There were significant differences between cure rates of patient by Lady Health Workers and family member's supervision vs self administered patients as 70-80% vs 32%. Female patients were detected more than male patients 64% vs 34% detection rate. It was an additional benefit from this component of DOTS strategy as the Lady Health Worker serves as bridge and best source of communication and supporters between patients and hospital staff[19]. The Lady Health Workers trained specially in TB Control Program who visits community and convince female as a part of their job in Primary Health Care[20].

Between 2002 -2007 DOTS coverage increased in Pakistan from 44% to 90%. The proportion of defaulters decreased from 17% to 6%. In the project area case detection rate 65%, the coverage is 100% and defaulters were observed only 7%. Defaulter ratio is very less in females.

Sputum Spear Microscopy is the efficient method of diagnosis TB[21]. But it has low sensitivity as its positivity depend on the number of bacilli/ml in Sputum. The most efficient and rapid identification tools for smear negative cases (SSN) are the chest x-ray only. All though concentration method and culturing on Lowenstein Jenson Media are still the " Gold Standards" for the diagnosis of active TB, and especially in low resource countries[21]. Results of Smear Microscopy by Z.N Staining in the study showed 65% smear positive while remaining 35% Smear negative Sputum easily were confirmed by concentration method that is 12%. WHO/CDC 2000 reported[10] that if quality control is mentioned in Smear Sputum Microscopy, 80% of all Tuberculosis cases are suspected to be Sputum Smear positive[7]. Therefore, quality control needs improvement in training of Laboratory Technician and Para Medical Staff of the facilities.

As a whole, the WHO DOTS strategy for Strengthened control of Tuberculosis has been shown effective in the Pakistan setting, as else where. Present study shows that over all treatment outcomes were 53% cure rate, 35% patient treatment completed rate, 9% defaulted and 3% of the patients transferred out. These rates as other researchers analyzed in (Czech Republic, India and Bangladesh) were 75 to 80% cure and 65% case detection rate[22].

CONCLUSION

Favorable treatment outcomes (Cure and Completion) were achieved as compared to before strengthening DOTS in District Swat. The defaults and deaths were reduced with the current rate of progress in DOTS expansion, the target of 70% case detection and 85% treatment success was achieved. Health education promotion, fully involvement of lady health workers in the programme and training in DOTS of care providers with flexible DOTS (individualized) program according to the socio-cultural and local circumstances are the needs of the future DOTS.

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