



FAMILIAR FACE-TUBERCULOSIS; AN ENCOUNTER AT A BASIC LEVEL

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ABSTRACT... Objectives: To describe the profile and outcome of tuberculosis in a secondary care center in a low socioeconomic area in Karachi. **Study Design:** Descriptive cross-sectional study. **Setting:** Sir Syed Hospital, Karachi after ethical approval. **Period:** All cases diagnosed and treated as tuberculosis from January till December 2013 were included. **Material and Methods:** Data from the medical records on demographics, signs and symptoms, laboratory investigations, and outcome status were recorded. All the data was entered in SPSS version 20. Quantitative variables were analyzed for mean \pm SD. Results of categorical variables were obtained in numbers and percentages. **Results:** Among 214 patients who received anti-tuberculous treatment during the period of study, 44% were male and 66% were females. Mean age was 32.6 ± 16.6 years. Contact tracing was done in 2% of patients. Most of the patients 80.8% came to the center on their own initiative. Around 68% of the patients had pulmonary tuberculosis. Sputum smear was done in 49.5% of patients out of whom 52% were Smear positive. CBC was the most common investigation ordered in these patients (78%). ESR was done in 69% of the patients. Extra pulmonary tuberculosis was diagnosed in 32% of patients and the diagnosis was made mostly on basis of clinical data. Tuberculous pleural effusion and tuberculous lymphadenitis were the most common extra-pulmonary sites involved. Around 67% patients completed treatment and 29% defaulted. None of the patients who defaulted were traced to find reason for default. **Conclusion:** Tuberculosis is epidemic in Pakistan. The National TB Program is contributing a lot towards control of the epidemic but some changes, better training and stricter monitoring is required in order for it to achieve optimal coverage and utilization.

Key words: Tuberculosis. National Tuberculosis Control Program.

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INTRODUCTION

Tuberculosis was announced to be a worldwide threat and emergency by World Health Organization in 1993. At that time it was widespread in many regions of the world. In spite of the efforts of the World Health Organization (WHO) the disease still is causing a great burden on resources and is the seventh greatest reason for mortality worldwide.¹ Another cause for concern is that the disease now has a significant number of multi-drug resistant tuberculosis (MDR-TB) cases.² Also the rising epidemic of HIV is contributing to the spread of tuberculosis.³

These factors associated with low socioeconomic status and low literacy rate in endemic countries are the main factors responsible for the spread

and persistence of tuberculosis in these countries.⁴ The Millennium Development Goals (MDGs) were developed keeping this menace in mind. The goal was to halve prevailing burden of the disease and reduce mortality caused by TB by the year 2015.

Although some countries have met some of these goals but the situation is still far from desirable.

Recent advances in the diagnosis and treatment of tuberculosis should have made the management of this disease easier but the disease is still leading to death, disability and poor quality of life with a huge economic impact.

It is common knowledge that tuberculosis is

rampant in Pakistan. According to WHO statistics Pakistan is 5th in the High Burden Countries in the world in terms of estimated number of cases.⁵ In the East Mediterranean region where Pakistan is designated by WHO, Pakistan has 65% burden of the disease. In the poor socioeconomic areas of urban Sindh specifically Karachi tuberculosis has been found to be the second most common reason of death among the adult population.⁶

Tuberculosis control is an important part of the public health policy in Pakistan. It has undeniable implications for the community on the whole. Therefore all the actors in the health system such as the central and provincial governments as well as the private sector have to play a role in its conception, application and control.

In Pakistan the National Tuberculosis Control Program controls all the responsibilities involving tuberculosis control activities. These include policy guidelines, technical support, coordination, monitoring and evaluation; and research. Provincial Tuberculosis Programs are responsible for the actual care delivery process including program planning, training of care providers, case detection, case management, monitoring and supervision. National TB program is playing a pivotal and crucial role in the control of TB in Pakistan.⁷

The declared target of the National TB Control Program is the reduction of disability and death caused by tuberculosis. In Pakistan TB control program objectives are to achieve 85% cure rate in smear positive pulmonary TB and to identify 70% of new cases. This is in accordance with the millennium development goals. These objectives were said to be achieved in 2015 according to the National TB Control Program. But the need to consolidate and improve these targets is a task which has to be realized.

The success of the different tuberculosis control programs have been because of better diagnostic and treatment facilities along with community health awareness. This also involves co-operation of public, NGO and private sector

health setups. An important part of the national TB control program is advocacy, community and social mobilization.

We need to analyze the working of this program in every sector in order to optimize its efficacy and utility. The purpose of our current study was to assess the implementation and working of the TB control program at the peripheral level.

MATERIAL AND METHODS

This was a cross-sectional descriptive study which was conducted in the TB clinic at Sir Syed Trust Hospital, Sir Syed College of Medical Sciences from 1st January 2013 to 31st December 2013. This is a Basic Management Unit for the National TB Control Program. Ethical approval for the study was obtained from the ethical review board of the institution. Informed consent was taken from all patients included in the study.

The inclusion criteria for this study were all patients registered in the National Tuberculosis Control Program. Patients being treated for tuberculosis at the hospital but who were not registered in the National TB control program were excluded. A structured proforma was used to collect the data. This data included the demographic details, diagnostic data, clinical data and treatment outcomes. In order to analyze the functioning of the TB control program as was being run in the clinic the data was obtained only from the files. The files included the tuberculosis form no. TB 01 Tuberculosis treatment (card), the treating physician notes and the investigations carried out for the patient. Information regarding the practices was obtained from the staff in order to clarify certain points regarding collection of data, investigations and knowledge of staff dealing with tuberculosis patients.

Data was entered and analyzed using SPSS 20.0 (SPSS Inc. Chicago, Illinois). Results of categorical variables were obtained in numbers and percentages while the continuous variables were analyzed using mean and standard deviation.

RESULTS

During the period of study a total of 214 patients were enrolled in the TB clinic. The results revealed that the patients were mostly younger patients with mean age ± SD of 32.6±16.6 years. Most of the patients were female 55.6% while 44.4% were male. Around 68% of the patients were suffering from pulmonary tuberculosis and 32% (n=68) had extra-pulmonary tuberculosis. The patients had mostly come to the hospital on their own (80.8%) while 8% had been recommended to attend the clinic by their family or community members, 8% patients were referred from a private facility while 1 had been referred from a public health facility. Most of the patients 85.5% were new, 5.6% had been transferred in and 5.1 % had come after default. Contact history was taken in 4% of the patients but no contact screening was documented. The patients were treated for a mean duration of 6.2±3.4 months. The treatment outcome indicated that 67.3% patients completed treatment, 29% defaulted and 3.7 % were transferred out. (Table-I).

Variables		n	%
Gender	Males	95	44.4%
	Females	119	55.6%
Age (Mean+SD)	32.6+16.6		
Type of Disease	Pulmonary	146	68%
	Extra-pulmonary	68	32%
Type of Referral	Self	173	80.8%
	Private facility	18	8.4%
	Public facility	3	1.4%
	Community member	17	7.9%
	Others	3	1.4%
Patient Type	New	183	85.5%
	Transfer	12	5.6%
	After default	11	5.1%
	Relapse	7	3.3%
	Others	1	0.5%
Treatment Outcome	Completed	144	67.3%
	Defaulter	62	29%
	Transfer out	8	3.7%

Table-I. Characteristics of Registered Cases (n=214).

The investigation most commonly offered to the patient was a complete blood count 78%, 69 % of the patients had ESR ordered for them, 67% had a chest X-ray done, while 49.5% had sputum for

acid fast bacilli ordered. Out of this 25.7% patients were smear positive and 23.8% were smear negative. Other radiological tests like ultrasound, CT scan and MRI were offered to 12.6% of the patients. 8.4% of the patients had Mantoux test and one patient had sputum for culture and sensitivity done which turned out to be sensitive for all first line anti-tuberculous therapy. (Table-II)

Variable	Availability of report	n	%
Complete Blood Count	Performed	167	78%
	Not Performed	47	22%
Erythrocyte Sedimentation rate	Performed	148	69%
	Not Performed	66	31%
Chest X-ray	Performed	144	67%
	Not Performed	70	33%
Sputum Smear for Acid fast Bacilli	Performed	106	49.5%
	o Smear Positive	55	25.7%
	o Smear Negative	51	23.8%
	Not Performed	108	50.5%
Other Radiological Tests	Performed	27	12.6%
	Not Performed	187	87.4%
Fluid Routine Examination	Performed	15	7%
	Not Performed	199	93%
Mantoux Test	Performed	18	8.4%
	Not Performed	196	91.6%
Culture for Acid Fast Bacilli	Performed	1	-
	Not Performed	213	-

Table-II. Laboratory and radiological Investigations of registered Cases (n=214).

DISCUSSION

The overall objective of the National Tuberculosis Control Program is the reduction of mortality, morbidity and disease transmission so that tuberculosis does not pose a risk to public health. Success of the tuberculosis control program depends on a number of factors among which the most significant are population and community awareness, patient and family education, health provider education and the correct delivery of the tuberculosis control program.

The case detection and treatment success rate has improved steadily after the introduction of DOTS in 2001. This has been due to improvement in quality of smear microscopy, drug management, community awareness programs, decentralizing care from limited health care centers through

involvement of tertiary care hospitals, NGOs, semi-private and private health providers.¹

Although some areas of the tuberculosis control program have been successful but there are some shortcomings which need to be addressed before this program can achieve its goals. The center at which this study was conducted is a private secondary health care center. Its location was central to a large population belonging to low-socioeconomic group therefore its inclusion as a partner in the national TB control program was logical. But the awareness among the local population that this was a TB care center with free diagnosis and treatment of tuberculosis was scant. This deficiency of knowledge has been observed in many high TB burden countries.² Most of the patients who were referred to this tuberculosis control center were referred from the hospital Medical Out Patient Department. Very few of the patients knew beforehand of this center as a tuberculosis care center from their community members or through a private practitioner or other health care facility. This is a reason why the patients registered in this center were so few. Only 214 patients were registered during the whole one year of study. Insufficient knowledge about the disease could also be a factor for this small number of patients.³

On arrival at the clinic the patient was examined by the doctor and assessed for the correct diagnosis. The recommended investigations were sent and the patient was started on anti tuberculous therapy after being registered into the program.

The National TB program emphasizes the fact that proper diagnosis will lead to start of early and effective therapy for patients. But it offers only sputum for acid fast bacilli for the diagnosis of tuberculosis in the patients. This test was not offered to all patients and the patients were not motivated enough to go for the test so that if they had no or scanty sputum, sputum induction was not explained and carried out by them. This lead to the fact that the diagnosis of tuberculosis was mostly established through the consulting

physician's clinical intuition. It was also observed that the patients bore the cost of other tests which were ordered for the patient, some of which were non-essential. Therefore complete blood count, ESR and chest X-rays were the mainstay of diagnosis in many cases. Even Mantoux test was ordered in many cases forgetting that this test is not a reliable indicator of the disease in an endemic country.⁴ Pulmonary tuberculosis was diagnosed often in the absence of positive sputum smear. In only 25.7% of the registered tuberculosis patients the diagnosis was supported by a positive sputum smear. Other studies reveal similar observations.^{5,6,7}

Chest x-ray was over utilized for diagnosis of tuberculosis with 67% of the cases utilizing it for diagnosis of tuberculosis. Some cases had no history suggestive of tuberculosis or had no documentation of such a history.

The practice in the center was that the patient was given a request for sputum examination and told to go to the laboratory for the test. It was the patient's responsibility to collect the result and report back to the doctor. Another caveat was recognized here that a sputum positive smear which was not collected by the patient was not followed by either the laboratory or the clinic staff as patients were not registered unless they were started on anti-tuberculous therapy.

The sputum smears have to be randomly rechecked by the central lab quarterly thus maintaining a basic standard to the reliability of this test. This was a regular practice at the laboratory. Only two sputum samples were collected from the patient for diagnosis. But this is according to the guidelines of WHO and the number of diagnostic sputum for acid fast bacilli exams has now been set to 2 under National TB control program. GeneXpert is now being offered at certain centers for quicker diagnosis and quick assessment of resistance status. Sputum C/S is more sensitive and specific than sputum smear. But is prohibitively expensive and is not widely used. Sputum culture was done only in one of our patients. PCR for AFB was not done in any of our

subjects. The newer tests like GeneXpert were not available at this center.

There is evidence that many doctors start treatment of tuberculosis without getting sputum tests done, as evidenced by two studies from Pakistan and India respectively.^{8,9}

Some other factors which lead to a reduced efficacy of using sputum for AFB as a diagnostic test is that little or no training of the staff and lack of diagnostic services at the basic healthcare level, or of non-availability of reagent and even lack of request of the sputum smear leads to sub-optimal functioning of the TB control program.

Extra-pulmonary tuberculosis was not diagnosed according to WHO criteria and only 30% of extra-pulmonary tuberculosis patients had their sputum smear done. Most of these patients were started on anti-tuberculous therapy without the confirmation of the diagnosis through proper investigations. This was probably due to the fact that the tests for diagnosis were either invasive or costly and the patient population was not economically prepared to meet these expenses. The TB control program does not cover the cost of investigations for extra-pulmonary tuberculosis. Easy availability of reliable labs and a proper system of reporting these tests should make the TB control program more effective.

The policy of tracing contacts is part of the form to be filled for every patient at time of booking for the National TB control program. But it was not filled in any of the forms studied. Around 4% of the files revealed history of tuberculosis in the family. The policy should be to offer sputum smear to all close contacts of the sputum smear positive case.

Our center did not perform contact screening. Especially children and young adults contacts of a case with smear positive pulmonary tuberculosis should always have sputum examination as recommended. National TB control program guidelines which are given to the personnel at a TB control center do not detail the mechanism

of contact tracing and consistent feedback. This remains a deficiency in the TB control program as undiagnosed contacts can be major cause of spread of disease.

Non-essential initiation of therapy and unsatisfactory monitoring of the therapy will cause suboptimal management of the epidemic. Most cases in our study were category 1 and were given appropriate doses of anti-tuberculous therapy as one doctor supervised the whole program after registration of the patients into the program. According to other studies general practitioners do not have adequate knowledge about the dosage and regimen recommended by WHO and therefore the guidelines are not followed. This has also been observed in India.^{10,11,12}

Our observation is that training and re-training of the personnel is required so that they follow the WHO recommendations. There were periods in the treatment of tuberculosis when the regular drug supply was not available. The patients were recommended to buy the drugs from the market. Some complied while others missed a few days of treatment. A result of this interrupted supply is that in some cases the patients were lost to follow-up leading to default. Irregular treatment and interruptions in treatment may lead to resistance.¹³

After the start of therapy the patients were followed at monthly intervals. The patient brought back the empty blister packs. This ensured that the drug intake was monitored and timely sputum smear examination was also done. This was done two months after start of therapy and if negative not repeated but if positive was repeated monthly. The repeated sputum smear was not ordered for all patients probably because many patients did not have the sputum examination done at beginning of treatment or their sputum smear was negative for acid fast bacilli in the beginning.

The regular follow-up of patients, if done as recommended, would ensure that defaulters are promptly recovered. Many studies have shown that patients default very frequently in Pakistan.¹⁴

In our study also, 29% patients defaulted and 5.1% of the patients who had registered for treatment had defaulted in past and now had come with recurrence of symptoms or disease. The factors which have been researched to cause default are the social stigma attached to tuberculosis, irregularity of follow-up visits, patient age over 25, rural residence, low educational status, being farther away from the TB clinic which could not be reached on foot and lack of social support.¹⁴ Both the genders have been found to be more at risk of default in various studies. In a study in England 74% of the patients completed treatment.¹⁵ We did not study reasons for default in the current study but observed that none of the defaulters were contacted. This can be due to lack of focus in this regard in the national TB program. The addresses on the forms were incomplete but most had cell numbers on them so if the clinic staff had wanted to contact the defaulters it would have been possible. There is no procedure in place in the National TB program to follow-up the defaulting patients so there are no resources available to contact the patients. The need to ensure regular visits and completion of treatment is very important so as to reduce the spread of disease in the community and stop the development of resistance.¹⁶

As there is proof that the incidence of drug resistance is increasing in Karachi we need to improve the compliance of patients towards anti-tuberculous therapy. The resistance for specific drugs was noted to be 27%, 15% and 11% for isoniazid, ethambutol and rifampicin respectively, while multi-drug resistance was found in 8% of the cases.¹⁷ This rate is expected to rise because of increase in internally displaced persons and irregular supply of anti-tuberculous therapy. We do not have any information about drug resistance in the current study as only one patient underwent culture for the acid fast bacilli. The main prohibitive factor for this is the cost as the patients belonging to low socioeconomic group are not willing to spend extra money for this test. Sputum culture is also not part of the national tuberculosis program. Many private practitioners who started the patient on anti-tuberculous therapy did not

have the knowledge that this test should be performed and in which situations. No recent studies are available for this. There was no need to start on second line drugs in our center, usually MDR cases are referred to tertiary care centers where they follow WHO recommendations as local data for help in choosing the proper therapy is unavailable.

The current public healthcare system is insufficient for the population needs so private health facilities and health practitioners play a large role to fill in this gap. A majority of patient's first contact with the health system is through a private general physician. Studies have shown a below par clinical approach to tuberculosis on part of these doctors. All facets of management including diagnosis, screening, prescribing and follow-up do not follow WHO guidelines. Starting with a single drug, incorrect prescription, inadequate instructions to patients, not following DOTS and inappropriate management of treatment failure are some of the shortcomings in treatment by general physicians. The national tuberculosis program has failed to take into account the fact that most patients with tuberculosis will go to a private practitioner initially, therefore education of these doctors regarding all the aspects of tuberculosis management is very important.^{18,19}

The de-centralization of tuberculosis management from public to private health facilities can play a role in better management. Increased private sector feedback to improve their role in the TB control program is required. Another step in increasing private-public collaboration could be to encourage private practitioners to refer patients to recommended laboratories for sputum examination and registration of patients and then back referral to the primary physician. This should also help in proper reporting and record maintenance.

Community can play a big role in control of tuberculosis. Tuberculosis still carries a stigma and patients are afraid of how family and community members will respond to the news. Social stigma leads to delay in health seeking behavior

by patients as well as impacting on adherence to treatment. The stigma attached to TB is well documented, especially in qualitative studies. As TB is associated with poverty, overcrowding and malnutrition, patients are often ashamed of having TB, and try to hide this from employers, friends and family members. Stigmatization results in delays in health seeking behavior, a lack of disclosure and non-adherence to treatment.

There is a better prognosis for patients with tuberculosis whose family members are involved in the management of their disease. Community health education can improve the knowledge about the disease and the government support that is available for patients suffering from tuberculosis.

National Tuberculosis control program needs stronger political support to become more effective. Results obtained from studies that research the efficacy of the program should be utilized to improve policies and patient management. The TB control program can be strengthened through proper and specific delegation of tasks to its different components; improved recording, registration, documentation and control; effective people, private and public partnership; and most importantly personnel training in all these points.

A strategy involving many aspects of management is required to improve the situation. Knowledge and practice of primary treating doctors need to be improved. Regular refresher courses to re acquaint with who criteria of diagnosis and treatment of these doctors is the need of the hour. This should be one of the responsibilities of the National tuberculosis control program and not only the management of the cases. Education of patients and general public should also be undertaken to increase awareness and to improve health seeking behavior.

Better coordination between private practitioners and government health providing services can be a function of NTP. Greater political will and government funding is required for a better

impact.¹⁹

At the peripheral level involvement of primary health providers in planning of TB control activities, provision of free and trustworthy lab facilities, prompt availability of anti-tuberculous therapy and maintenance of feedback can be an important component of a TB control program. Private practitioners working on the recommendations of national TB control program could be made satellite DOT center. All these recommendations will ensure full participation of the private sector and success of the TB program.⁶

Major challenges in TB control in Pakistan can be a poor primary health care in rural areas of all provinces; unaware, unregulated and unsupported private health care providers; diagnosis of tuberculosis unsupported by appropriate lab investigations; widespread and irrational use of anti-tuberculous drugs; population at large uneducated about tuberculosis and its treatment; persistent social stigma associated with tuberculosis; financial constraints on part of government and patients; lack of political will and inefficient TB control program.

Over the years there has been a marked improvement in the case detection rate and treatment success rate. These can be translated into a complete control of tuberculosis if the national TB control program is adjusted to overcome the gaps identified through its own and other researches.

CONCLUSION

Proper implementation of National TB control program is required to ensure complete coverage of patients with tuberculosis and ensuring correct diagnostic and therapeutic practice by the medical community. Regular educational courses and continued medical education regarding the WHO criteria for diagnosis and treatment of Tuberculosis should be directed towards private practitioners, Tuberculosis clinics, secondary and tertiary care hospitals and medical students. More co-operation with National Tuberculosis control program and private health facilities for better

coverage by this program is the call of the hour. Community education will also play an important part in control of this epidemic.

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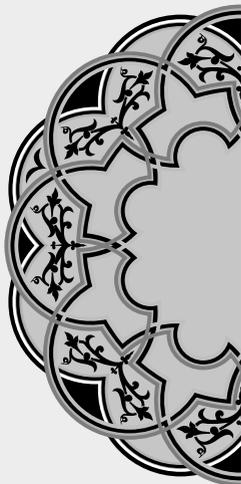
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*“Victory has a thousand fathers,
but defeat is an orphan.”*

John F. Kennedy

AUTHORSHIP AND CONTRIBUTION DECLARATION

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1	Dr. Farhat Bashir	Concept, Collection of data, Analysis literature, review write up	<i>Farhat Bashir</i>
2	Dr. Naresh Kumar Seetlani	Collection of data, Literature review	<i>Naresh Kumar</i>
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