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STUDY OF THE STATUS OF TUBERCULOSIS CONTROL PROGRAM BASED ON THE IMPLEMENTATION OF THE DIRECTLY OBSERVED TREATMENT SHORT-COURSE STRATEGY (DOTS)

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ABSTRACT

Introduction: Ascendant trend of tuberculosis in the world introduces this disease to be one of the most important infectious diseases in the world. So that every year, 9 million people are afflicted to active TB and about 5.1 million people die of the disease. As the HIV contaminated cases are increased, emergence and spread field of Multidrug-resistant tuberculosis (MDR-TB) bacilli has been provided. **Objective:** This study aimed to assess the Tuberculosis Control Program from 2005 to 2012 to determine the overall situation of disease epidemiology and prioritized strategies in disease control program within the south of Tehran. **Materials and Methods:** This cross-sectional study was extracted and analyzed retrospectively on the basis of records of all TB patients in TB health center and TB software in south Tehran in 2005-2012 years. **Results:** From the total population under protection of health center of south Tehran, 99% are urban and 1% are rural. During 2005-2012, 1242 TB cases have been registered and they were treated by DOTS method. There were 553 cases of new smear-positive pulmonary TB (44%), 222 cases of smear-negative pulmonary TB (18%) and 336 cases of extra-pulmonary tuberculosis (27%), 26 cases of recurrence (2%) and 11 cases of MDR (0.9%). Smear-positive pulmonary tuberculosis has included 67.4% of all tuberculosis patients. **Conclusions:** The results showed that, in accordance with TB worldwide statistics, at the health center of south Tehran, pulmonary TB is the most common form of the disease (67.4%). The incidence of smear-positive tuberculosis and all forms of TB cases has been an ascending trend over the period between 2005 and 2012.

Key words: DOTS, HIV, TB, smear-positive pulmonary tuberculosis.

1. INTRODUCTION

Tuberculosis is a bacterial disease, mostly caused by *Mycobacterium tuberculosis*, and for adults, is often with sputum smear positive that it is highly contagious (1). The World Health Organization observing upward trend of global burden of TB, in the Assembly of 1991, announced tuberculosis as a global emergency (2, 3). Then provided the background for controlling the disease and achieving to these objectives relatively, by introducing DOTS strategy (3). The availability of free diagnostic and treatment services, detection through sputum smear microscopy experiments at all levels of nation's health care were the main pillar of the implementation of this strategy. Circular of merging control of control programs and care of TB in the network system in 1990 issued by the General Office of the fight against disease and was

communicated to all provinces (4). Then, Ministry of Health and Medical Education in 2002, according to international recommendations and the proposed National Technical Committee, forced all medical universities to implement it (5). Studies in different parts of the world suggest that the implementation of the DOTS treatment increases treatment success rate of 90-95% and even greater (4). Table 1 showed The tuberculosis case detection statue in the south Tehran (2010). According to the latest statistics from the Centers for Disease Control, the incidence of TB in the world in 2013 were 122 cases and 109 cases in the region of Iran that is, 21 cases per hundred thousand population (5). 10555 is the total number of TB cases in 2012 and 5334 is the number of smear-positive pulmonary tuberculosis at the current time. Tuberculosis is a contagious disease and therefore sources

	Number	Reported incidence rate (/100000)		CDR	
		Reported	Expected		
All TB forms	183	15.9	23	69.3	
pulmonary tuberculosis	Sputum positive-smear	70	6.1	11	56%
	Sputum negative-smear	32	4.4		
Extra-pulmonary tuberculosis	59	5.1			

Table 1. The tuberculosis case detection statue in the south Tehran (2010)

	I.R.IRAN	region	world
Prevalence rate(/100000)	33	180	169
Mortality rate(/100000)	2.9	16	13
Incidence rate(/100000)	21	109	122
Case detection rate	71%	63%	67%
Hiv prevalence among tb cases	3.8%	12%	13%
Treatment success rate	84%	88%	87%

Table 2. Status indicators of TB control program in the world, the Eastern Mediterranean region and the Islamic Republic of Iran in 2012

	Number	Reported incidence rate (/100000)	
All TB forms	10044	12.9	
pulmonary tuberculosis	Sputum positive-smear	4975	6.39
	Sputum negative-smear	1964	2.52
Extra-pulmonary tuberculosis	2795	3.59	

Table 3.The TB incidence rate in 2013 in Iran

of emissions and the amount of disease in the community is essential (5). Currently, the incidence of smear-positive pulmonary TB, is the most important indicator of TB situation in the country (5). According to the latest World Health Organization report in 2012, more than 12 million people worldwide are infected with tuberculosis that more than 80% of them are associated to 22 developing countries in the world. There are about 8.6 million new cases of active TB, it is estimated that about 1.3 million people will die of this disease. More than 90% of TB cases and deaths occur in developing countries (5-9).

Quotient of frequency of tuberculosis entry to the country population is called TB incidence rate, that the distribution map of the world countries has been displayed.

The tuberculosis incidence and prevalence rate in 2012 is estimated at 122 and 109 respectively in the world population at one hundred thousand people. Simultaneous HIV-infection significantly increases TB disease risk. Countries with high HIV prevalence rate, especially those in sub-Saharan Africa have witnessed a dramatic increase in the number of tuberculosis patients and a significant increase in the number of TB patients and increase 2 to 3 times the rate of incidence reported in the '90s. In 2012, the HIV prevalence rate among TB patients in the world has been estimated to be 13%. At the same time, multidrug resistance, which is re-

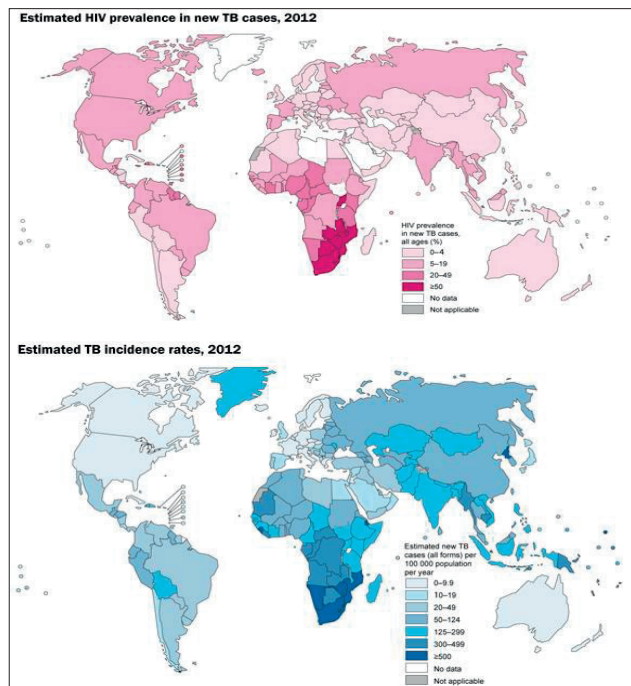


Figure 1. Estimated HIV Incidence/Prevalence in new TB cases sulted of poor management in TB treatment is a serious and growing problem in many countries of the world (5) (Table 2). Table 3. The TB incidence rate in 2013 in Iran showed (5).

2. METHOD

This study is retrospective descriptive and in terms of time is longitudinal.

The society in this study includes all TB patients living in the south area of Tehran (areas 10 -11 -16 -17-19 of municipality) registered in the TB Registry of city and online office system of Health tuberculosis Ministry during 2005-2012. Statistical reporting of TB cases sent by the public or private sector to health center, is registered in online Tuberculosis registration system of Ministry of Health by coordinator of the Tuberculosis in the city, and is treated and monitored by health centers in south Tehran, The number of registered TB patients in the study was 1242 patients, and the studied population is chosen because tuberculosis is still in the area proposed as a public health problem and TB incidence rate is one of the indicators of justice in the country. Information required after coordination with the relevant authorities of the TB office of south Tehran were extracted and evaluated according to the national standards and objectives of the study in "Registration and Analyzing TB patients of Ministry of Health" system. To evaluate this program 17 indicators have been determined by the Ministry of Health, that according to data from 2005 as well as their importance, 8 index were chosen as variable (the incidence rate of smear-positive, the ratio of smear-positive cases to all cases of suspected tuberculosis, the negative sputum smear at the end of the attack treatment, the success rate of treatment for TB patients, mortality rate of new cases of smear-positive pulmonary tuberculosis, age, sex, nationality) and were analyzed by the SQL software of Ministry of Health system.

3. RESULTS

From the total population under protection of health center of south Tehran, 99% are urban and 1% are rural. During 2005-2012, 1242 TB cases have been registered and they were treated by DOTS method. There were 553 cases of new smear-positive pulmonary TB (44%), 222 cases of smear-negative pulmonary TB (18%) and 336 cases of extra-pulmonary tuberculosis (27%), 26 cases of recurrence (2%) and 11 cases of MDR (0.9%). Smear-positive pulmonary tuberculosis has included 67.4% of all tuberculosis patients. The highest incidence of tuberculosis has been in 2012 (16) and the lowest has been in 2005 (6.7). The highest incidence in smear-positive patients has been in 2005 has been with 6.8, and the lowest has been in 2005 with 3.2. The highest incidence of smear-positive pulmonary tuberculosis has been at the age of 65 years and in men, it has been more (58%) than women. Most pulmonary tuberculosis patients have been in the age group of 25-34 years and in women, it has been more (55%) than men. Median of delay in diagnosing all forms of TB has been 71 days and for smear-positive tuberculosis, it has been 67 days. 53% of recurrence cases has occurred in the interval of less than 2 years after previous treatment of the disease. 49% of patients have been with a history of less than 2 years ago of contact with smear-positive patients. Median age of smear-positive patients is 53 and in all cases, it is 48 years. The median age is higher in Iranian patients (52) and in non-Iranian patients it is 29 years. The sputum smear negativity at the end of the attack and the success of the treatment process has been acceptable. 126 patients (10%) have had a history of risk factor for HIV infection, 40% of this group had been also infected with HIV. 146 children in close contact with smear-positive pulmonary tuberculosis patients have been checked and 7 children with tuberculosis was discovered. Sputum smear positivity in 52.5% of cases has been +1.

4. DISCUSSION

From the total population under protection of health center of south Tehran, 99% are urban and 1% are rural. In other words 1% of the population is settled in rural areas with low health, and patient detection in this group must be made actively. Proportion of detection of patients with smear-positive pulmonary tuberculosis is less than 70% in recent years that indicates, identification of patients is less than the national index. 44% of all registered patients are with smear-positive and 18% smear-negative and 27% with extra-pulmonary smear. According to the assessment indicators of TB program, the proportion of smear-positive pulmonary tuberculosis to all patients with pulmonary tuberculosis have been recorded approximately 65% which, has been at the rate of 69% in the south Tehran in 2012. Also, the proportion of new cases of smear positive to smear negative pulmonary and extra-pulmonary new cases would be approximately one to one that, above proportion has been at the rate of 7.5 in this study in 2012, that it would be because of failing to identify new cases of smear-positive pulmonary tuberculosis or treatment without exact diagnosis of smear-negative and extra-pulmonary tuberculosis. The present results correspond with Arsang et al's studies in Iran with a ratio of 0.6 (11). The highest incidence rate of tuberculosis

was in 2012 (16) and the lowest rate was in 2005 (6.7) and has been relatively stable from 2007 onwards. The highest incidence rate of smear-positive pulmonary tuberculosis has been at the age of 65 years and it has more level in men (58%) than women. In 2012, the highest age group with extra-pulmonary tuberculosis has been between 25 to 34 years and it has been more in women (55%) than men. Proportion of men to women in Iran is equal to 1. Low average age and shows down control measures and higher average age represents a better TB control in the region. According to state evaluation index, proportion of new identified TB cases to all cases of suspected tuberculosis is equal to 5, which is less than 5 in south Tehran, this could be due to low quality samples or laboratory errors (5, 12, 13).

Median age of smear-positive patients is 53 and in all cases it is 48 years. The median age is higher in Iranian patients (52) and it is 29 years in non-Iranian patients (14-17). It can be said that the pattern of patient age in this city is slightly different than in other areas so that in the same studies in Arak, the disease in people has occurred over 60 years (12). Disease existence at early ages that imposes health problems and a heavy financial burden for families and the health system is one of the major challenges facing the health center of south Tehran. The highest incidence rate has been in the population over 65 years, which is evidence of success in TB control (18). The most common organ involved in extra-pulmonary TB is lymph nodes with prevalence rate of 28%, which is consistent with the pattern of other people and reference books (19-27). 53% of recurrence cases has occurred during the interval of less than 2 years after the disease previous treatment, 49% of patients have had a history of contact with smear-positive patients less than 2 years ago that, this confirms importance of correct investigation those around the patient for TB detection (27). The negativity rate of sputum smear-negative at the end of the attack stage and the success of the treatment process has been acceptable. 126 (10%) patients have had a history of risk factors for HIV infection, 40% of this group have also been infected with HIV. 146 children in close contact with smear-positive pulmonary tuberculosis patients were investigated and 7 children were discovered with tuberculosis. Sputum smear positivity degree in 52.5% of cases has been +1 (5, 23-27).

5. CONCLUSION

The results showed that, in accordance with global TB statistics, also in the health center of south Tehran, the most common form of the disease is pulmonary TB (67.4%). The incidence rate of TB and smear-positive pulmonary tuberculosis cases has had an ascending trend over the period of 2005-2012. Median delay in the diagnosis of smear-positive patients has been 67 days, which can be considered as an important factor in the spread of disease. The median age of patients with extra-pulmonary tuberculosis were significantly less than the median age of patients with smear-positive pulmonary tuberculosis. The smear-positive pulmonary tuberculosis incidence in men is higher, but for extra-pulmonary tuberculosis, it is more in women. Given that the proportion of HIV diagnosis counseling and testing for TB patients have a risk factor for infection (53%), so

checking this group should be considered in terms of HIV diagnosis counseling and testing. Case detection rate in 2012 was 56%. Sensitization of doctors in the private sector, strengthening and the coordination continuity of reporting, providing feedback to the private sector, and employing new training methods can be appropriate solutions to increase the rate of detection.

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