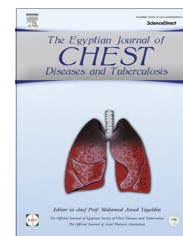


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Evaluation of treatment failure outcome and its predictors among pulmonary tuberculosis patients in Sharkia Governorate, 2013–2014

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KEYWORDS

TB control program;
 Treatment failure outcome;
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Abstract *Background:* Picking up tuberculosis (TB) treatment failure cases and its determinants is urgently needed in resource-limited developing countries. This work shows incidence and probable leading factors of TB treatment failure among patients who were managed by a TB control program.

Aim and objectives: This study aims to promote the TB control program at the ministry of health and population (MOHP) chest hospitals, Sharkia Governorate with the following objectives: (1) Determine the incidence of TB treatment failure. (2) Assess probable factors of TB treatment failure.

Patients and methods: A retrospective cohort study was carried out at MOHP chest hospitals, Sharkia Governorate. The study sample included all registered TB patients ($n = 480$) during the study period (2013–2014). There were 30 TB patients (Failed cases) with a positive sputum smear after 5 months of treatment (Group 1). Cured cases were 384 TB patients whose sputum smear was positive at the beginning of the treatment but became smear-negative at the end of treatment and on at least one previous occasion (Group 2). Both groups were compared to evaluate leading factors of treatment failure.

Results: Of the 480 TB patients registered during the study period (2013–2014), the incidence of treatment failure was 6.25%. Treatment failure cases were significantly more likely to have: positive sputum smears at 2 months of TB treatment ($p < 0.01$), cavities on the baseline chest radiograph ($P < 0.01$), extensive disease on the baseline chest radiograph ($P < 0.001$). Also, retreatment case ($P < 0.01$) and CAT 11 treatment category were ($p < 0.001$).

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Conclusion: This study showed that the treatment failure rate in our locality is relatively high. Positive sputum smear at 2 months of TB treatment, radiological findings and retreatment patients were found to be predictors of TB treatment failure that should be recognized early and closely followed up.

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Introduction

Tuberculosis (TB) leads to 1.8 million deaths every year. Most of cases were present in low to middle income countries, this is further supported by studies carried out in both high and low income countries which demonstrate significantly higher rates of TB in their poorer populations [1].

The control of tuberculosis (TB) remains a challenge worldwide, more so in developing countries like Egypt where treatment target has not yet been met. TB control aims to detect at least 70% of the sputum smear positive cases and to cure at least 85% of the sputum smear positive cases. If these goals are achieved, there is a decrease in prevalence, incidence, transmission and drug resistance to TB [2].

The proportion of pulmonary TB cases whose sputum smear or cultures are positive after 5 months or later during the course of treatment is an important point recommended by the WHO for the monitoring of TB control success [3].

These patients are defined as treatment failure cases. Treatment failure is a serious problem because cases tend to have higher morbidity and mortality compared with those who are cured. Also, they carry the risk of being infectious for a long time; hence, reflects the level of risk to close contacts of the patients as well as high rates of multidrug-resistant TB have been found among treatment failure cases especially in developing countries [4,5].

Few studies have shown that predictors of TB treatment failure may include social, radiological, laboratory and treatment-related factors, but these factors can vary in different populations and it is important to assess the situation in specific settings [6].

Aim and objectives

This study aims to promote the TB control program at the ministry of health and population (MOHP) chest hospitals, Sharkia Governorate with the following objectives: (1) Determine the incidence of TB treatment failure. (2) Assess probable factors of TB treatment failure.

Patients and methods

A retrospective cohort study was carried out at MOHP chest hospitals, Sharkia Governorate. The study sample included all registered TB patients ($n = 480$) during the study period (2013–2014). There were 30 TB patients (Failed cases) with a positive sputum smear after 5 months of treatment (Group 1). Cured cases were 384 TB patients whose sputum smear were positive at the beginning of the treatment but became smear-negative at the end of treatment and on at least one

previous occasion (Group 2). Both groups were compared to evaluate leading factors of treatment failure.

Data were gathered from TB registry and medical records from the Sharkia Health Directorate. Identification and review of the documents and records which evaluate plan/guidelines, the input processes and output data of studied patients who were under cover of the MOHP national tuberculosis control program were revised. The collected data included TB registration code, patient number in the TB registry, name, age, sex, residence, history of previous treatment, diagnosis, culture results, regimen of treatment given, results of sputum examination (at 0, 2, 3 months, at the end of the initial phase, and at the end of treatment), and treatment outcome at the end of treatment. The study included a total number of 480 patients.

Methods

- (1) **Patients' history:** All patients' data that were gathered from records sheets of Sharkia Health Directorate included:
 - Age and sex.
 - Residence (rural or urban).
 - Education level (illiterate, primary, secondary, tertiary and university level).
 - Marital status (married, single, widowed or divorced).
 - Occupations (employed or unemployed).
 - Special habits {smoking (cigarette or goza), alcohol and drug abuse}.
 - Human immune deficiency (HIV) positive cases.
 - History of medical co-morbidity {diabetes mellitus (DM), hypertension (HPN), ischemic heart disease (IHD), liver diseases, and chronic obstructive pulmonary diseases (COPD)}.
 - History of contact to tuberculous cases.
 - History of previous anti-tuberculous treatment:
 - Number of treatment courses.
 - Regularity in the treatment (regular and irregular) and if the patient continues treatment or defaulted.
- **Type of treatment (CAT1 or CAT2):**
 - **CAT1 (regimen1) (for all new cases with sputum smear positive):** Treatment regimens have an initial (or intensive) phase lasting 2 months and a continuation phase usually lasting 4 or 6 months. Initial phase, consists of Isoniazid, Rifampicin, Pyrazinamide and Ethambutol or Streptomycin. Continuation phase consisting of isoniazide and rifampicin.

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