Original Research

Registration and management of community patients with tuberculosis in north-west China

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ABSTRACT

Objectives: To describe the registration, management and characteristics of patients with tuberculosis (TB) in north-west China, and investigate whether patients with TB were diagnosed and treated in a timely manner.

Study design: Health-facility-based retrospective data were collected from district patient registers and case reports for all patients with TB registered from January 2009 to December 2011 in Xinjiang Uygur Autonomous Region, north-west China.

Methods: Patient characteristics and clinical data were collected from the national TB epidemic reporting system using standardized case reporting forms for diagnosis, treatment and outcome. Data were collected and entered by trained health staff in the regional TB clinics.

Results: In total, data for 20,396 patients with TB were collected; of these, 78.5% were farmers. The age peaks were 20–44 years and 60–74 years. Average health-seeking and diagnostic delays were 32 days and two days, respectively. More than half (54.7%) of the patients with smear-negative TB were diagnosed by chest x-ray. Moreover, 94.3% of patients with TB were treated successfully. From 2009 to 2011, the health-seeking delay decreased significantly ($P < 0.05$), and the diagnostic delay increased significantly ($P < 0.05$). A significant decreasing trend in smear-positive TB was observed ($P < 0.05$), along with an increasing trend in treatment success ($P < 0.05$).

Conclusions: In north-west China, there is a need to focus on key high-risk populations for prevention and control of TB, such as those aged 20–44 years and 60–74 years, males and farmers. Delays in diagnosis and treatment have a negative effect on cure rates and make it more difficult to control the propagation of TB.

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Introduction

Tuberculosis (TB) remains a major public health problem, and is among the top 10 causes of death worldwide despite the fact that it is a preventable and treatable disease.[1] In 2012, it was estimated that there were nine million cases and 1.5 million deaths due to TB worldwide. China was the second highest ranked country, accounting for nearly 11% of the world's TB burden.[2] Over the last 20 years, China has developed an official network of TB control centres, and the China National TB Control Programme uses the 'DOTS' (directly observed treatment and short-course chemotherapy) model for control of TB.[3]

However, the incidence of TB (both new and relapsed cases)[4] and the TB mortality rate remain high in China, which may be related to delays in diagnosis,[5,6] incomplete treatment and lack of effective supervision[1] coupled with poor socio-economic conditions,[7] drug resistance, etc.[8,9] Delayed diagnosis of pulmonary TB will contribute to spread of the epidemic.[10] The effectiveness of anti-TB therapy depends on timeliness and well-managed supervision in communities. A major obstacle for the control of TB is failure to complete the regular treatment course of ≥6 months.[11] In addition to cases with typical symptoms such as a persistent cough, the number of non-typical cases is increasing significantly[12] which may represent a further obstacle. Therefore, rapid detection, diagnosis and effective treatment of patients with TB are important to control the disease.

Xinjiang Uygur Autonomous Region has the second highest prevalence of TB in China. In this region, the smear-positive TB rate and the TB mortality rate are much higher than the national average (incidence estimated to be 463 cases per 100,000 persons per year).[13] Few studies have investigated registration and management information for patients with TB in this region.[14] Therefore, the objectives of this study were to describe the types of TB, patient characteristics, and diagnosis and management information; to understand whether patients with TB were diagnosed and treated in a timely manner; and to determine the system of management supervision, including daily drug intake supervision, health care and isolation. These data may provide indications for possible improvements in TB control in China. The study results will help to improve the management of TB and its prevalence in Xinjiang Uygur Autonomous Region.

Methods

Study design

Health-facility-based retrospective data were collected from district TB patient registration systems and case reports for all patients with TB registered from January 2009 to December 2011 in seven health facilities in Xinjiang Uygur Autonomous Region, north-west China. The study was approved by the Ethical Review Committee of Changji Regional Health Bureau (2013S04-03), and all aspects of the study complied with the Declaration of Helsinki. No informed consent was required because data were analysed anonymously; this was approved specifically by the ethics committee.

Data collection

Data were collected from the national TB epidemic reporting system using standardized case reporting forms for diagnosis, treatment and outcome. Data were collected and entered by trained health staff in the regional TB clinics. The completeness, quality and accuracy of reports were checked by regional TB health staff and trained investigators. Data were analysed, summarized and sent to the national TB control office. The study subjects were patients with pulmonary TB diagnosed at the Department of Tuberculosis Control under the municipal Centre for Disease Control (CDC) and the district CDC. The following patient characteristics and clinical data were collected from the case reports: age, sex, occupation, patient registration type, time of symptom appearance (such as cough, etc.), time of seeing doctor in healthcare facility, diagnosis and treatment, smear examination, and treatment outcomes.

In this study, patient registration type was divided into 'new case' and 'relapsed case' based on whether or not there was a history of TB treatment. The type of TB was classified as smear-positive, smear-negative, tuberculous pleurisy and extrapulmonary TB. The period (in days) from feeling ill to seeing a doctor at a healthcare facility (e.g. hospital, PTB dispensary, clinic) was defined as the health-seeking delay. The diagnostic delay was defined as the period (in days) between seeing a doctor and a definite diagnosis (confirmed by *Mycobacterium tuberculosis* in sputum and chest x-ray examination). The total delay was defined as the period from feeling ill until definite diagnosis, which was the combination of health-seeking delay and diagnostic delay.

Data analysis

Descriptive statistics were calculated using Statistical Package for the Social Sciences Version 18.0 (IBM Corp., Armonk, NY, USA). Patient age, sex, occupation, patient registration type and treatment outcomes were all described in categories as percentages (%). Health-seeking delay and diagnostic delay were described as mean [standard deviation (SD)]. Chi-squared test was used to compare the status of patients with TB (qualitative data) between the sexes and between the three years of the study. Finally, independent non-parametric tests were used to compare the health-seeking delay and diagnostic delay between the sexes and between the three years of the study.

Results

In total, 20,396 patients with TB (10,824 males and 9572 females; male:female ratio = 1.31:1) were included in this study (Table 1). The mean age was 49.4 (SD 19.1) years (50.2 years for males and 48.4 years for females; $P < 0.01$). Overall, 21.6% of patients were aged 45–60 years, 38.6% were aged ≥60 years (of these, 31.1% were aged 60–75 years and 7.5% were aged ≥75 years), 6.1% were aged 0–19 years, and 33.7% were aged