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Full Length Article

Determining treatment outcome of smear-positive pulmonary tuberculosis cases in Afar Regional State, Ethiopia: A retrospective facility based study ☆

Ketema Tafess [a,*], *Belete Mengistu* [b], *Desalegn Woldeyohannes* [c], *Solomon Sisay* [d]

[a] *Department of Medical Laboratory Sciences, College of Health Sciences, Arsi University, Asella, Ethiopia*
[b] *Directorate of Pastoralist Health Promotion and Disease Prevention, Federal Ministry of Health, Addis Ababa, Ethiopia*
[c] *Department of Zoonoses, Aklilu Lemma Institute of Pathobiology, Addis Ababa University, Addis Ababa, Ethiopia*
[d] *Federal Ministry of Health, Addis Ababa, Ethiopia*

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ABSTRACT

Objective/background: The World Health Organization (WHO) declared tuberculosis (TB) as a global public health emergency and recommended directly observed treatment, short-course (DOTS) as a standard strategy to control the disease. In Ethiopia the strategy was started in 1992 as a pilot in the Arsi and Bale zone, Oromia Region. The DOTS strategy has been subsequently scaled up in the country and implemented at a national level reaching better coverage, although there are recognizable variations from region to region and district to district. The aim of this study was to assess the impact of the DOTS strategy on smear-positive pulmonary TB case findings and their treatment outcomes in the Afar Regional State, Ethiopia, from 2003 to 2012 and from 2002 to 2011, respectively.

Methods: A health facility-based retrospective study was conducted. Data were collected and reported on a quarterly basis using the WHO reporting format for TB case findings and their treatment outcomes from all DOTS-implementing health facilities in all zones of the region to the Federal Ministry of Health.

Results: A total of 34,894 of TB cases had been registered in the period from 2003 to 2012. Out of these, 11,595 (33.2%) were smear-positive pulmonary TB, 13,859 (39.7%) smear-negative pulmonary TB, and 9838 (28.2%) extrapulmonary TB. The case detection rate (CDR) of smear-positive pulmonary TB had increased from 18.3% to 37.2%, with the average value being 32% (standard deviation = 6.8) from the total TB cases to its peak of 39% in 2008. The treatment success rate (TSR) had an average value of 86.2% from 2002 to 2011 with its peak value being 96.5% in 2007. Moreover, the average values of treatment defaulter and treatment failure rate were 2.9% and 2.7%, respectively.

* Corresponding author at: Department of Medical Laboratory Sciences, College of Health Sciences, Arsi University, P.O.Box 193, Asella, Ethiopia.
E-mail address: ttafess@gmail.com (K. Tafess).
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Conclusion: The implementation for the DOTS strategy in the area improved the CDR of smear-positive TB, although it is unacceptably lower than the recommended WHO target of 70%. Additionally, the WHO target of 85% for TSR had already been achieved in the region. However, continued efforts should be in place to increase the CDR and maintain the high TSR registered.

Introduction

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis*, which is a rod-shaped bacillus called "acid-fast" due to its staining characteristics in the laboratory. Globally, in 2012, an estimated 8.6 million people developed TB. At the same time, there were 1.3 million deaths from the disease (including an estimated 1.1 million cases and 320,000 deaths among human immunodeficiency virus [HIV] infected people). About 58% of the 8.6 million people who developed TB in 2012 were from Asian and African Regions, respectively [1].

In 1993, the World Health Organization (WHO) declared TB as a global public health emergency and recommended directly observed treatment, short-course (DOTS) as a standard strategy to control TB. The multidimensional DOTS framework was being implemented in 184 countries and over 132 million patients had been treated with DOTS which resulted in more than 125 million people being cured [2]. The specific targets of DOTS were detailed in the updated global plan of TB from 2011 to 2015 for achieving a case detection rate (CDR) of 84% (for all forms of TB) and a treatment success rate (TSR) of 87% for smear-positive TB by 2015 [3].

The DOTS strategy was piloted in Ethiopia in 2000 at the Arsi and Bale zones of Oromia Regional State [4]. In 2010, it was gradually scaled up to the entire country and came to have 100% district- and 90% health-facility coverage [5]. Evaluating treatment outcome of TB is essential in order to assess the effectiveness of DOTS strategy in different regions of a given country [6]. Additionally, understanding the specific reasons for unsuccessful treatment outcomes is helpful for improving the quality and accessibility of treatment service [7]. The aim of this study was to assess the impact of the DOTS strategy on smear positive-pulmonary TB case findings and their treatment outcomes in the Afar Regional State, Ethiopia from 2003 to 2012 and from 2002 to 2011, respectively.

Materials and methods

Study area

The Afar Regional State consists of five administrative zones and 30 districts. The size of the population in the region according to the 2007 National Census was about 1,390,273, out of which 775,117 (55.75%) were men and 615,156 (44.25%) women [8].

Study design

Health facility-based retrospective data were collected for TB cases that were registered during the study period from 2003 to 2012 and for their treatment outcomes from 2002 to 2012 in the Afar Regional State.

Inclusion and exclusion criteria

All forms of TB cases that were registered during the study period were included in the study. Treatment outcomes of extrapulmonary TB and smear-negative pulmonary TB cases were excluded as treatment outcomes mainly focus on smear-positive pulmonary TB cases due to their infectiousness compared to other forms of TB and the scope of study.

Data collection procedures

Data were collected by WHO standardized reporting formats for case detection and treatment outcomes. Reports from all zones in the region were collected by trained data collectors and investigators. Data were first collected from health facilities where TB focal persons compiled the data and reported it on a quarterly basis about all TB patients entered into the TB clinic, assigned a unique TB registration number for each TB patient, and submitted the report to zonal TB focal persons who were responsible for compiling a zonal summary, and in turn, the zonal TB focal persons submitted the report to the regional TB Program Officer. The regional TB Program Officer checked the completeness, quality, and accuracy of the reports. Then, data were analyzed and interpreted, and sent as a compiled report to the Office of National Tuberculosis and Leprosy Control Program Office, Federal Ministry of Health.

Data analysis

Data that were collected and reported from standardized WHO formats were analyzed and interpreted using excel spread sheets and SPSS version 20 (SPSS Inc., Chicago, Il, USA). Data were summarized using frequencies, percentages, and standard deviations including for mean values of variables like CDR, TSR, death rate, and defaulter rate.

Data validation

Federal Ministry of Health (FMOH), Ethiopia used the Health Management Information System for all health program recording and reporting, which consisted of its own unique data collection book and reporting format. Data that were obtained by WHO reporting formats were crosschecked for the data which were obtained in the Health Management Information System for maintaining consistency of information within the study period.