



RESEARCH ARTICLE

Implementation of Same-Day Sputum Smears Microscopy in Addis Ababa, Ethiopia: Programmatic Qualitative Study

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Abstract

Introduction: In countries that have ensured effective External Quality Assessment (EQA) sputum smear microscopy, World Health Organization (WHO) has recommended the implementation of same-day smear sputum microscopy. In Addis Ababa, Ethiopia, the status of the same-day sputum smear microscopy implementation was not yet assessed.

Objective: To assess the status of same-day sputum smear microscopy implementation in Health Facilities (HFs) of Addis Ababa, Ethiopia from June to September 2018.

Methods: In-depth interview of Health Care Providers (HCPs) at Outpatient Departments (OPDs), clinical laboratories and Directly Observed Treatment Short Course (DOTS) centres was conducted to assess the status of same-day sputum smear microscopy policy uptake, implementation and practices in selected HFs for the study. Check list based laboratory records review of 28 HFs were conducted to assess the status of same-day sputum smear microscopy implementation.

Results: All public and only 1 (10%) of private HFs that were licensed to provide Tuberculosis (TB) diagnostic and DOTS services have implemented same-day sputum smear microscopy. In 10 (83.34%) public HFs that have implemented same-day sputum microscopy, smear results were available for presumptive and confirmed TB patients in batch in the afternoon. While confirmed TB patients were waiting for smear results until afternoon, it allows contact with non-presumptive patients that came to seek other health care services (might facilitates TB transmission) or some of the confirmed TB patients returned back to their home until smear results were available for them (might contributed to the diagnostic drop-out) and transmission of TB within the community.

Conclusion: The implementation of same-day sputum smear microscopy in Addis Ababa, Ethiopia didn't comply WHO policy recommendation. Awareness creation for HCPs on same-day sputum smear microscopy implementation and early anti-TB treatment initiation for sputum smear positives on same-day of their diagnosis reduces transmission of TB and defaulter from diagnostic paths.

Keywords

Same-day, Sputum, Smears, Microscopy

Abbreviations

DOTS: Directly Observed Treatment Short-Course; HCPs: Health Care Providers; HFs: Health Facilities; OPDs: Out Patients Departments; REQAS: Regional Quality Assessment Scheme; SD: Standard Deviation; TB: Tuberculosis; WHO: World Health Organization

Background

Sputum smear microscopy remained the most widely used test method in developing countries and is the means by which universal access to TB diagnosis and treatment can be achieved [1]. Even though the two-day sputum smear microscopy approach is better in sensitivity, it allows many patients to make repeated visits to HFs for specimen delivery and sputum smear results collection [2]. For many patients, the cost of repeated visit to HFs was prohibitive and defaulting from the diagnostic paths was the major problem [1,2]. As result, WHO has recommended a reduction in the number of sputum specimens from the two days to same-day in

countries that have ensured strong and appropriate external quality assessment systems of sputum smear microscopy [1,3].

Addis Ababa City Administration Health Bureau has announced the implementation of same-day sputum smear microscopy in the year 2015 in HFs under city administration. Nevertheless, the status of implementation of same-day sputum smear microscopy in these HFs was not yet assessed.

On the other hand, commitment of HCPs play great role for the success of TB control program implementation and early anti-TB treatment initiation. However, the status of awareness of HCPs on same-day sputum microscopy implementation was not assessed in Addis Ababa, Ethiopia.

Therefore, the present study assessed the status of implementation of same-day and challenges in implementation and awareness of HCPs on the implementation same-day sputum smear microscopy.

Methods

Study design and setting

Programmatic qualitative study was conducted in 22 (12 public and 10 private) HFs which were providing TB diagnostic and DOTS services and 6 private HFs providing diagnostic but not licensed for DOTS were conducted from June to September 2018 to determine status of awareness of HCPs on same-day sputum smear microscopy policy uptake and implementation. In Addis Ababa, there were more 896 public and private HFs, of which 101 public and 52 privates were being delivering TB diagnostic and DOTS services [4]. Of 52 private HFs providing TB diagnostic and DOTS services, 10 and 12 of 101 public were purposively selected for this study. Of private HFs which was not licensed for DOTS, 6 were selected to see TB microscopy diagnostic approach and practices. Private HFs was licensed for DOTS based on the capacities, infrastructures and their preparedness to provide the services. Thus, health posts of the public and lower clinics of privates were not parts of this study. Those TB patients that were smear positive in privates HFs licensed for diagnostic but not for DOTS were referred to public HFs for full courses of DOTS services and public HFs cross check the results before treatment initiation.

The study was supplemented by check list based records review and in-depth interview of HCPs at OPDs, clinical laboratories and DOTS centers to assess the status of awareness of HCPs on same-day sputum smear microscopy implementation and practices in selected HFs for the study. Addis Ababa has the total areas of 540 square kilometers with 10 sub-cities and 116 districts and an estimated total population of 3,384,569, with annual growth rate of 3.8% [5].

Reference population (target population)

All HFs and HCPs in Addis Ababa were the reference

population of this study.

Source population (study population)

All HFs providing TB diagnostic services in Addis Ababa and HCPs in these HFs.

Study Sample

Laboratory professionals, HCPs in DOTS centers and OPDs of selected HFs performing sputum smear microscopy services in Addis Ababa.

Inclusion criteria: All HFs which perform sputum smear microscopy.

Exclusion criteria: Health facilities with incomplete data since same-day sputum microscopy implementation and HCPs not working on TB service delivery during the study period.

Sample size determination and sampling procedure

28 HFs were purposively selected for the study and HCPs in these HFs were in-depth interviewed to determine their awareness on same-day sputum smear microscopy implementation. Thus, 12 public, 10 private HFs providing TB diagnostics and DOTS services and 6 privates HFs which provides diagnostic but not DOTS were included in the study to determine the status of same-day sputum smear microscopy implementation.

Data collection tools

Questionnaires were developed to conduct in-depth interviews of HCPs in laboratories; OPDs and DOTS centers determine the same-day sputum smear microscopy policy uptake and implementation in these HFs.

Data collection procedure

Before data collection, the prepared questionnaires were pre-tested and data collectors were trained on data collection tools. In-depth interviews of HCPs and records review were conducted to assess the status perception; practices and implementation of same-day sputum smear microscopy.

Data management, analysis and assurances

Adequate training was given for data collectors and appropriate supervision was made throughout data collection. Data collectors were instructed to check the completeness of each data before submission. The principal investigators rechecked the completeness of the data while receiving from data collectors and conceptual analysis was conducted by the principal investigator.

Results

Implementation status of same-day sputum smear microscopy in Addis Ababa, Ethiopia

In this study, 28 (12 public and 16 privates) HFs were

assessed to determine the status of same-day sputum smear microscopy implementation. All public and 1 (10%) of private HFs which were licensed to provide both TB diagnostic and DOTS services have implemented same-day sputum smear microscopy. Eight, 8 (80%) private HFs provides TB diagnostic and DOTS service by spot-morning-spot, 1 (10%) diagnose by mixed (spot-morning-spot, spot-spot and one spot) and 1 (10%) by morning-spot approach. None of the private HFs 6 (100%) providing diagnostic but not licensed to provide DOTS have implemented same-day sputum smear microscopy.

Even though all public (12) HFs have implemented same-day sputum smear microscopy, 10 (83.34%) of them collected sputum specimens from presumptive TB patients once a day early in the morning, perform smearing, staining and microscopic examination in batch; smear results were available for the TB patients in the afternoon. Thus, it allows presumptive TB patients to stay in the HFs until sputum smear results were accessible for them; which in turn gave chance of transmission of TB to non-presumptive TB who came to seek other health care services or some of them might returned back to their home (might contributed) for drop-out from diagnostic paths, contacts within the community and transmission of TB.

In-depth interview of laboratory professionals, HCPs in OPDs and DOTS centers of selected HFs for the study were conducted to determine the status of awareness on same-day sputum smear microscopy implementation. Consequently, 5/27 (18%) of laboratory professionals, 11/21 (52.38%) HCPs in OPDs and 5/20 (25%) in DOTS centers of public HFs, 5/16 (31.25%) of laboratory professionals, 7/10 (70%) of HCPs in OPDs and 4/10 (40%) in DOTS centers of private HFs that were licensed to provide TB diagnostics and DOTS services didn't have information on same-day sputum smear microscopy implementation.

Laboratory professionals working in selected HFs for the study have asked the advantages, disadvantages, challenges in implementation, practices and additional suggestions to increases the quality of implementation and services delivery related to same-day sputum smear microscopy. Most specimens collected on spot were saliva; hence decreased bacillary loads in sputum and strongly argue the algorithm should not miss productive early morning specimen.

On the other hand, they have mentioned frequent return to TB laboratory for every patient (first spot and second spot after one hour) sputum collection, smear preparation; staining and microscopic examination might increase the risk of laboratory professionals for TB and might add additional workloads.

Lack of training on same-day approach, stock-outs of reagents and supplies, insufficient human power as laboratory workloads, lack of motivation and risk

allowance for laboratory professionals, inadequate space of TB laboratory, infrastructures including water supply and electric power supply interruption were some of the challenges mentioned.

Health education on transmission of TB, signs and symptoms, pre-screening of presumptive TB patients by HCPs in OPDs and correlating cardinal sign and symptoms to physical examination, pursuing and proper instruction of presumptive TB patients on how to produce and spout out good and productive sputum specimen and cares to be made for confirmed TB patients for transmission break might increase case detection, decreases the diagnostic defaulters and strengthen TB control program implementation.

Health care providers in OPDs and clinical laboratories were asked stipulating the defaulter rate of presumptive TB patients were reduced up on implementation of same-day sputum smear microscopy. Health facilities were carrying out sputum smear microscopy in batch collecting from presumptive TB patients once a day in the morning which allows these patients to return back to their home in anticipation of sputum smear microscopy results were available for them in the afternoon which might increases the defaulter rate or stay with other non-presumptive health care seekers; might facilitate TB transmission.

Treatment initiation time of HCPs for sputum smear positive TB patients registered in selected HFs for study after same-day sputum smear microscopy implementation was evaluated. Thus, 3/13 (23.07%) HCPs in DOTS centers preferred provision of anti-TB treatment early in the morning before intake of any diet; appointed confirmed TB patients that came in the afternoon to start their treatment in the next morning, 2/13 (15.38%) put on first dose and adjust the appropriate time of next consecutive treatment, 3/13 (23.07%) put on treatment based on the arrival of the TB patients at DOTS centers by asking their intake of any diets. About 5/13 (38.46%) had started anti-TB treatment for smear positive on the same-day of their diagnosis. The majorities 9/13 (67.54%) of HCPs in DOTS centers didn't started anti-TB treatment for smear positive on same-day of their diagnosis.

The average work load of sputum smear microscopy per laboratory professionals, laboratory professionals' distribution in HFs and number of trained laboratory professionals on AFB was calculated. The average workloads of laboratory professionals per month per person were 13 (\pm 2 SD) sputum smear slides, laboratory technologists accounted 53 (56%) of laboratory professionals and 39/92 (42.40%) were trained on AFB sputum smear microscopy.

Impacts of unimplemented same-day sputum smear on external quality assessment

Failure of implementing 8 (80% of private HFs

under diagnosis and DOTS) and 6 (100% of diagnostic) and 10 (83.34%) same-day sputum smear microscopy might influence collection of sputum smear slides for blinded- rechecking by lot quality assurance method from HFs in similar manner [6,7] which in turn has an impact on system of strengthening EQA and timely feedback mechanism as well for corrective action from the feedback from EQA centers. World Health Organization has recommended countries that have ensured good EQA should be gradually shift to same-day implementation [1].

Discussion

The average monthly workloads of thirteen (13) sputum smear slides per laboratory professionals was lower than previous study conducted in west Amhara, Ethiopia with monthly workloads 19.5 (SD \pm 2.9) slides [8]. It could be due to the number of hired laboratory professionals and the prevalence of TB in general population might vary from region to region.

In-depth interviews of laboratory professionals, HCPs in OPDs and TB DOTS centers on the implementation of same-day sputum smear microscopy indicated lack of training on same-day sputum smear microscopy approach, stock-outs of reagents, supplies, sufficient human power, lack of motivation, risk allowance for TB as laboratory workloads, lack awareness on sign and symptoms of TB, how to produce and provide good sputum specimen by presumptive TB patients were some of challenges mentioned.

Similar findings were reported from west Amhara, Ethiopia and Congo Kinshasa and Uganda, indicating supportive supervision, timely feedback, internal and external quality assurance practices, equity in training and resource distribution were issues given less attention in these areas [8-11].

The majorities, 9/13 (67.54%) of HCPs in DOTS centers didn't start anti-TB treatment on same-day of their diagnosis for smear positives; they might returned back to their home which might contributed for the drop-out the from the diagnostic paths, hence continued transmission of TB in the community.

World health Organization (WHO) same-day sputum smear microscopy implementation policy recommendation indicated high drop-out of TB patients diagnosed by the two days approach as compared to same-day approach [1]. Study conducted in pastoralist communities in Ethiopia and other indicated, majorities of smear positive patients delayed either for diagnosis or treatment; continue to serve as reservoirs of infection with mean delay time of 21 days [12-14]. Similar study conducted in northwest of Ethiopia implied the mean duration of tuberculosis diagnosis and initiation treatment of 41days [15].

Conclusion and Recommendation

The implementation of same-day sputum smear microscopy in Addis Ababa, Ethiopia was not as intended to reduce the diagnostic drop-out nor smear positive pulmonary TB patients started anti-TB treatment on same-day of their diagnosis. Enforcements of private HFs in implementing same-day sputum smear microscopy, awareness creation for HCPs on same-day sputum smear microscopy approach implementation; and benefits obtained by confirmed and presumptive TB patient-son same-day treatment initiation and presumptive community is essential.

Ethical Considerations

Ethical clearance was obtained from Addis Ababa Health Bureau Ethical Review Committee and letter of support were obtained from Addis Ababa public Health Research and Emergency Management (AAPHREM) and HFs participated in the study were informed. Before conducting in-depth interview the aim of the study was explained and verbal consents were obtained from study participants.

Acknowledgement

We would like to like to the thank Addis Ababa City Administration Health Bureau and Public Health Research and Emergency Management Core Process for giving us this opportunity.

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