Abstract

Introduction

Tuberculosis (TB) continues to be a major public health threat worldwide, more so in the developing world. Early diagnosis of TB is crucial both clinically and epidemiologically. Sputum smear microscopy (SSM) has been the primary method for the diagnosis of pulmonary TB. The existing standard SSM procedure requires a TB suspect to give a spot sputum sample and another early morning sample which requires at least two visits. Upto 50% of patients fail to return to provide a second specimen or receive results and are called as “diagnostic defaulters” who continue to move in the community and contribute significantly in disease spread. Techniques for optimization of SSM are under active investigation. If the total process could be completed on the “same-day” it would reduce the number of visits required and the patient drop-out as well.

Conclusion

This paper adds a thought about how the SSM can be improved. As culture facilities are not uniformly available, SSM is the widely used method for diagnosis of TB in developing countries like India. Same-day microscopy protocol if adopted will surely change the face of TB diagnosis in India.

Editorial

Tuberculosis (TB) the second leading cause of death among the infectious diseases continues to be a major public health threat worldwide, more so in the developing world. The “captain of all these men of death”, TB has been a scourge of the humankind from time immemorial. Till date, no other disease in history matches the sheer magnitude of the misery inflicted by TB on the human race in terms of morbidity and mortality.¹ There were an estimated 8.8 million new cases of TB globally in 2010, with 1.1 million deaths and an additional 0.35 million deaths among the people co-infected with human immunodeficiency virus.² A staggering 95% of these cases and deaths occur in developing countries.³ India has featured among the 22 high burden countries; and has accounted for an estimated one quarter (26%) of all TB cases worldwide.⁴

Early diagnosis of TB is crucial both clinically and epidemiologically. Sputum smear microscopy (SSM) has been the primary method for the diagnosis of pulmonary TB in low and middle income countries. The existing standard SSM procedure requires a TB suspect to give a spot sputum sample and another early morning sample (SM scheme). This requires at least two visits and does not take patient convenience or cost into account. For a variety of reasons, upto 50% of patients fail to return to provide a second specimen or receive results and are called “diagnostic defaulters”.⁴

The greatest disadvantage is that such patients continue to move in the community and by the time they are diagnosed, they already have contributed to the spread of disease in the community.

Techniques for optimization of SSM are under active investigation. If the total process could be completed on the “same-day”, that is, if all or the majority of sputum sample collection could be made on the first day and results made available on the same day, it would reduce the number of visits required and patient drop-out as well. Despite recent advances in rapid diagnostics, SSM remains the most widely used test in low-income countries and is likely the only means by which universal access to diagnosis and treatment can be achieved. Currently Revised National Tuberculosis Control Programme (RNTCP) follows the two days approach (SM scheme) for SSM. The major obstacle in SSM is patient dropouts⁴ and with this SM approach also, patients are spending significant amounts of money on travel and food besides loss of daily wage in order to reach the TB microscopy centre. Efforts to improve the performance of SSM are a high priority for global TB control.

Front-loaded microscopy is a new diagnostic strategy in which two smears are prepared from one or more sputum specimens on the first day a patient is assessed.⁵ When all samples are collected and the results are reported on the first day, the strategy is termed as same-day microscopy. This procedure is quite beneficial from patient’s perspective as it reduces the economic burden of an additional visit and will lead to the lesser drop-out rates during diagnosis. A study conducted by an expert group of World Health Organization (WHO)⁶ evaluated the diagnostic accuracy of same-day microscopy and found that the standard approach of “spot-morning” sputum smears had much the same sensitivity and the specificity as that of “same-day microscopy”. They also found that patients assigned to same-day diagnosis were more likely to submit both specimens (dropout, 2%) than patients screened conventionally (dropout, 5.8%). Based on these

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findings, WHO issued a policy statement recommending that "countries that have implemented the current WHO policy for two-specimen case-finding consider switching to same-day diagnosis, especially in settings where patients are likely to default from the diagnostic pathway." Whether under field conditions or in the microscopy centre, not enough time is spent in motivating the patient to bring out a good quality sputum sample, which is the mainstay of the whole RNTCP programme. Morning specimens have repeatedly shown greater bacillary load and high sensitivity than spot samples. Hence, the majority of the clinicians are reluctant to rely on the negative result of spot specimens. Of course, ethically and ideally, one should not miss out on any case but if we weigh this loss of positivity against the advantage of returning the patients and preventing dropouts, we feel that this scheme of same-day microscopy is justified. If two spot samples are properly collected on the same day, we can do away with morning samples. Moreover, this same day diagnostic approach for pulmonary TB can help to initiate therapy on the same day and can save time as well as resources of the patients.

**Conclusion**

Developing strategies to improve the efficiency and sensitivity of smear microscopy is an urgent priority for global TB control. Although tremendous improvement has occurred in the control of TB in India, much more is desired to be achieved and we need to be determined to adapt, improvise, innovate and act to move forward. Same-day sputum microscopy has the potential to improve the diagnostic accuracy of pulmonary TB. In order to implement same-day sputum microscopy significant organizational and program changes need to be done first, and surely this method will go a long way in achieving a TB free nation.

**References**