First Panel Testing In SAARC Regional Networks of TB Reference Laboratories

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Setting: South Asian Association for Regional Co-operation **(**SAARC) region with disproportionately high burden of TB in comparison of regional population**.**

Objective: To establish a quality assurance on sputum smear microcopy in SAARC regional network of TB reference laboratories.

Methods: Panel of slides were prepared and sent to national TB reference laboratories. The laboratory technician read the slides and sent report to SAARC TB center and report were analyzed.

Results: Seven laboratories had no error of any type and one laboratory got two minor types of errors.

Conclusion: Mot of the laboratories had excellent performance in panel testing.

Key words: Panel testing, SAARC Region

Introduction

South Asian Association for Regional cooperation (SAARC) includes the seven countries- Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. SAARC region has 22 percent of the global population and 29 percent of global burden of tuberculosis. 2.5 million new TB cases and 0.6 million TB deaths occur in SAARC region. Of the 22 high burden countries India, Pakistan and Bangladesh occupies first, 5th and 6th position among the high burden countries[1].

A network of nine National TB Reference Laboratories and SAARC TB laboratory has been established with the objective to share experience, capacity building, to harmonize the standard operating procedure of the TB laboratory and to establish a system of quality assurance within the network.

Panel testing is one of the activities conducted within the network. Panel testing refers to a system of retrospectively and objectively compared results from different laboratories by means of programme organized by external agency such as reference laboratory. The main objective of panel testing is to establish between laboratory comparability, in agreement with a reference standard[2].

The objective of the present study was to implement an panel testing for sputum microscopy within the Networks of SAARC Regional TB Reference Laboratories and SAARC TB Reference Laboratory in SAARC Region.

Materials and Methods

A panel of 25 slides consisting 7 negative slides, 7 with 1-9AFB/100 field, and 5, 3,3 slides with 1+ve, 2+ve and 3+ grading, respectively were prepared by Tuberculosis Research Institute (TRC) from the clinical samples. The slides were checked by three senior technicians and validated before including into the panels. Those slides were sent following to seven National TB Reference Laboratories in SAARC Region:

National TB Reference Laboratory (NTBR), Shyamoli, Dhaka; Public Health Laboratory (PHL), Bhutan; Public Health Lab (PHL) Maldives; Ojaha Institute of Chest Disease Laboratory(OICD) Laboratory, Karachi, National Reference Laboratory, NTP, Pakistan; National TB Reference Laboratory(NTBRL), Sri Lanka,: by currier service and SAARC Regional TB Reference Laboratory. Those slides were requested to examine by laboratory

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Technician Laboratories and report according to WHO and IUATLD reporting criteria and send back report and slides. After receiving all the reports the reports were tabulated and analyzed.

Results

Hundred percent consistency was observed on reading negative and slides and the range was very high (50-100%), (Table I).

Analysis of the result

The result was interpreted on the basis WHO/IUATLD guidelines[3]. Of the eight laboratories participated, seven laboratories had no error of any type and only one laboratory had two minor errors (Table II).

Discussions

Panel testing is one of the three methods recommended for external quality assessment (EQA) in the recently released global consensus document. This method is considered to be less efficient than rechecking in higher level of the routine peripheral smears, as its result is not necessarily representative of routine performance[4]. This method has been selected in the initial phase of the TB reference laboratory activity and slides rechecking system should be adopted in future. Before this study none of the national TB reference laboratories were tested by Supranational TB Reference laboratory in the SAARC region. National network of laboratory exists in different form in each country but the quality assurance on sputum microscopy seems far behind from the expected level. At the same time many countries in the region have not achieved the WHO target of 70% case detection. Study report reveled that the quality assurance services have been very heterogeneous in SAARC region[5,6,7]. The first external proficiency panel testing was done when no national TB reference laboratory was being checked by any external agency. Of the eight laboratories participated in proficiency panel testing, seven laboratories had no error of any type and one laboratory had a low false negative (LFN) a quantitative error (QE). The study result demonstrated high level of performance in national TB reference laboratories.

Even though the performance of the national TB reference laboratories was very good, the consistency for reading 1-9AFB per 100 fields was only 61.8%, 72.5% to 1+slides, and 50% to 2+ slides but consistency to negative and 3+ was 100percent. The number of scanty positive identified at any level and confirmed during quality control itself already an indicator of the quality in that level[8]. Limited panel testing may be useful means to assess routine laboratory performance when no other method for quality assurance exists. Panel testing may also be useful in place where the intermediate laboratory structure necessary to support a re-checking program has not at been established[3].

Table I Proportion of consistency of slides reading by National TB Reference Laboratories

Grades of slide	Result of Ref Lab	Consistency of the participating National TB Reference Laboratories in reading different grade of slides									
		NTBRL Bangladesh	PHL Bhutan	PHL Maldives	NTC, Nepal	OICD, Pakistan	NTBRL, Rawalpindi Pakistan	NTBL Sri Lanka	SAARC TB Ref Lab	Total	%
Neg.	7	7	7	7	7	7	7	7	7	56/56	100
0-9	7	6*	3	6	5	5	4	1	4	34/55	61.8
1+	5	5	2	4	3	4	5	3	3	29/40	72.5
2+	3	0*	2	1	3	3	0	1	3	13/23	50
3+	3	3	3	3	3	3	3	3	3	24/24	100
Total	25	21	17	21	21	22	19	15	20	156/198	78.8
%		71.9	68.0	84.0	84.0	88.0	66.9	60	80		

* One slide was broken on transport

Many problem of proficiency testing such as fading of the smear, contamination with saprophytic AFB, loss of AFB from heat fixed smear has been discussed previouly[9]. There was not any kind of such problem observed in this study. Slide breaking during the transport of slide was one of the problems encountered in this study. In first proficiency panel testing two slides were broken in transport and slide was also broken in second proficiency testing (data not shown). The slide were broken, even though to prevent from breaking of slides in transport tissue paper was put as a cushion in between each slide and the slide box was sealed with thermo-cool cushion internally. After closing, the box was encircled with packing tape longitudinally and vertically. Another important factor for proficiency testing was slide transport cost. The panel of slides was sent by express delivery service to avoid in transport and prevent breaking. The average transport cost to deliver in the SAARC countries was $50.($30-$80). Therefore, the budgetary allocation should be made in time for panel testing.

Table II Analysis of the result

National TB Ref Lab	HFN	HFP	LFN	LFP	QE	Total errors
National TB Reference Laboratory, Shyamoli, Dhaka	0	0	0	0	0	0
Public Health Laboratory , Bhutan	0	0	0	0	0	0
Public health Lab Maldives:	0	0	1	0	1	2
Ojaha Institute of Chest Disease, Karachi, Pakistan	0	0	0	0	0	0
Federal Government TB Ref Lab, Rawalpindi, Pakistan	0	0	0	0	0	0
National TB Ref Lab, Sri Lanka	0	0	0	0	0	0
National TB Ref Lab, Nepal	0	0	0	0	0	0
SAARC TB Ref Lab	0	0	0	0	0	0

Conclusions

The over all impact of the network was very good. The network has provided common forum for to share the experience, to learn for each other, to discuss problems and training opportunities. It was also felt that the proficiency panel testing has motivated national TB Reference laboratories for their quality assurance and to conduct quality assessment activities within the national network for TB laboratory.

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