TOOL FOR SUPERVISION OF SCREENING FOR TUBERCULOSIS PATIENTS IN DISTRICT HOSPITALS.

Key words : tuberculosis, tool, supervision, screening, district hospital

Sompong Srisaenpang,MD. [1]

Maarten Elink Schuurman,MD.MPH. [2]

Somdej Pinitsoontorn,MD.MPH. [1]

Aroon Chirawatkul, Msc. [3]

Samai Kungsaworn, MD. [4]

Kriangsak Vaeteewootacharn, MD. [5]

[1] Faculty of Medicine, Khon Kaen University

[2] Royal Tropical Institute, The Netherlands

[3] Faculty of Public Health, Khon Kaen University

[4] 6th Zonal Tuberculosis Control Centre

[5] Office of Communicable Disease Control, Zone 6

เครื่องมือสำหรับการนิเทศ การคัดกรองหาผู้ป่วยวัณโรคในโรงพยาบาลชุมชน

สมพงษ์ ศรีแสนปาง, พบ. [1]

Maarten Elink Schuurman, MD. MPH. [2]

สมเดช พินิจสุนทร, พบ. สสม. [1]

อรุณ จิรวัฒน์กุล,วทม. [3]

สมัย กังสวร, พบ. [4]

เกรียงศักดิ์ เวทีวุฒมาจารย์, พบ. [5]

[1] คณะแพทยศาสตร์, มหาวิทยาลัยขอนแก่น

[2] Royal Tropical Institute, The Netherlands

[3] คณะสาธารณสุขศาสตร์, มหาวิทยาลัยขอนแก่น

[4] ศูนย์วัณโรคเขต 6

[5] สำนักงานควบคุมโรคติดต่อ เขต 6

บทคัดย่อ

สถานการณ์ : โปรแกรมการควบคุมวัณโรคในจังหวัดขอนแก่น ภาคตะวันออกเฉียงเหนือ ประเทศไทย

วัตถุประสงค์ : เพื่อพัฒนาเครื่องมือสำหรับช่วยให้ผู้นิเทศสามารถประเมินคุณภาพการคัดกรองผู้มีอาการสงสัย วัณโรคในสถานบริการสาธารณสุขส่วนท้องถิ่นได้โดยง่าย

วิธีการ : สำรวจวิเคราะห์ระบบที่ดำเนินการอยู่ในขณะนั้นแล้วออกแบบเครื่องมือ และทดสอบการใช้เครื่อง มือโดยนักวิจัยและโดยผู้นิเทศในระบบปกติ

ผล :   ได้เครื่องมือสำหรับผู้นิเทศที่ผ่านการทดสอบแล้วซึ่งประเมินตัวชี้วัดได้แก่   สัดส่วนของผู้มีอาการ
สงสัยวัณโรคที่ตรวจพบเชื้อจากแผ่นสไลด์เสมหะ   และสัดส่วนของผู้มีอาการสงสัยวัณโรคที่ได้รับ
การตรวจเสมหะสองครั้งและสามครั้งซึ่งบอกถึงคุณภาพของพฤติกรรมการคัดกรองหาผู้ป่วยวัณโรค
อนึ่ง เกณฑ์ที่ใช้ตัดสินคุณภาพของพฤติกรรมและแนวทางการดำเนินการกรณีมีปัญหา ก็ได้ถูก
กำหนดขึ้นด้วย

สรุป :   เครื่องมือสำหรับการนิเทศการคัดกรองหาผู้ป่วยวัณโรคในโรงพยาบาลชุมชนที่พัฒนาขึ้นนั้นง่าย
ต่อการใช้โดยผู้นิเทศ   เป็นที่ยอมรับของผู้รับการนิเทศ   และกระตุ้นให้เกิดการประเมินตนเองของผู้
รับการนิเทศซึ่งนำไปสู่การปรับปรุงพฤติกรรมให้ดีขึ้นได้

Abstract

Setting: The tuberculosis control programme in Khon Kaen province, North East Thailand.

Objective: To develop a tool for supervisors to easily assess the quality of screening for tuberculosis suspects in peripheral health units.

Methods: Field exploration, tool development and field testing by researchers and health professionals.

Results: A tested supervisors tool measuring the proportion smear positive tuberculosis suspects and the proportions suspects with two and three smears examined, indicative for screening performance. Defined acceptable levels of performance and remedial action to be taken.

Conclusions: The tool is simple to use by the supervisors, is acceptable to supervisees and stimulates to self assessment and improvement.

Key words: tuberculosis, tool, supervision, screening, district hospital

Request for reprints :

Assist. Prof. Dr. Sompong SRISAENPANG
Department of Community Medicine,
Faculty of Medicine, Khon Kaen University,
Khon Kaen, 40002 , Thailand.
Tel: 66-43-348391
Fax: 66-43-243064
E-mail: sompong@kku1.kku.ac.th

INTRODUCTION

In most developing countries detection of tuberculosis cases is done mainly passively: patients with chest symptoms who report themselves at the hospitals and clinics are screened for tuberculosis. This method is also advocated by the International Union against Tuberculosis and Lung Disease (IUATLD) and the WHO (1,2). The screening process is done by a doctor or paramedic who takes the history of the patient, and decides if the patient is a tuberculosis suspect. Usually the criteria are cough for more than 3 weeks and/or cough with blood stained sputum. In case of a tuberculosis suspect sputum samples are collected and examined in the laboratory for acid fast bacilli (AFB). In (busy) hospitals equipped with an X-ray machine a chest X-ray can be made first and only if the X-ray is abnormal sputum samples are examined.

This case detection process is important because smear positive cases are the main sources of tuberculous infection (3). It is also an important step to achieve the WHO global target of detecting 70% of existing new smear positive tuberculosis cases (4,5,6). Supervisors of tuberculosis control programmes therefore should specifically assess the performance of this screening process and assist the staff in the health facility to improve performance if necessary.

A tool to make the performance assessment in screening easier was developed by the MURLEP project[1] and is described below. This tool assesses the first two parts of the case detection process in a peripheral health unit: a) the selection and referral of tuberculosis suspects to the laboratory and b) the collection of three consecutive sputum samples for AFB. In another publication a tool for the quality control of the sputum smear examination itself is described.

---

[1]   The MURLEP project is a multidisciplinary health systems research project carried out by university researchers in cooperation with health service staff in Khon Kaen province, Thailand, aiming at the development of tools for tuberculosis control programme managers to easily assess the quality of the programme and to identify appropriate interventions to improve performance.

METHODS

In Khon Kaen province there are 19 district hospitals. After exploration of the practices and conditions in some district hospitals, the researchers designed the tool for supervision of tuberculosis screening performance and tested it out in 3 district hospitals. After several revisions the zonal tuberculosis supervisors were trained in the use of the tool. They informed the district hospitals by radio message about their supervision schedule. A few weeks later they went on a supervision tour along 13 district hospitals. During these visits they also had to try out a few other supervision tools. One researcher went along to observe the tool application but did not intervene. Two supervision visits, six months apart, were made to each hospital. The feasibility and ease of use were discussed with all staff involved and the tool adapted to its present format.

RESULTS

Format and description of the tool

A condition for the application of the tool is that the peripheral laboratory uses a register for sputum smear results that contains the same information as in the IUATLD model laboratory register given in figure 1 (1). If such a register is not present it should be provided and the laboratory technicians instructed how to use it.

The application of the tool consists of the following parts:

1. During the supervision visit the supervisor selects the last 10 pages of the laboratory register (see figure 1) or so many pages as to obtain smear results of at least 50 tuberculosis suspects.

2. On each selected page the supervisor adds up the number of positive and negative smear results in each of the three columns (1st, 2nd and 3rd sputum examination results) and writes the totals at the bottom of the columns (in pencil). He should not count the smear results of 'follow-up patients', but only of 'diagnosis' patients. Subsequently the supervisor copies the register page numbers and the column totals on the worksheet (see figure 2).

3. On this worksheet the supervisor fills out the row "Totals" and calculates the indicators according to the formula's. If the proportion of tuberculosis suspects with a positive 1st smear is between 5 to 10% and the proportion of tuberculosis suspects with two resp. three smears examined is 85% resp. 65% or more, the supervisor concludes that performance is acceptable. Otherwise he concludes that performance is not acceptable. For considerations on these acceptable levels of performance see the section 'discussion'.

4. The supervisor discusses the results with the district hospital staff and agrees on solutions for improvement. Guidelines for discussion:

   - The percentage of suspects with a positive first smear is less than 5%: The staff suspects too many patients of tuberculosis. This causes an overload of work in the laboratory and may decrease the quality of the laboratory results. The proper criteria of a tuberculosis suspect should be discussed (daily cough for more than two to three weeks and/or cough with bloodstained sputum (1,7,8)). Also it should be investigated whether the suspects referred from the outpatient department to the laboratory are arriving there and are served within a reasonable waiting time: some suspects may get lost or do not have enough time to wait for hours.

   - The percentage of suspects with a positive first smear is more then 10%: The staff suspects too few patients of tuberculosis,

and possibly real tuberculosis cases are not detected. Again the proper criteria of a tuberculosis suspect should be discussed.

- The percentage of suspects with two resp. three smear results is less than 85% resp. 65%: If not at least three smears (two smears suffice if both are positive) examined of each suspect, a real case of tuberculosis can be missed. Discuss with the staff their problems in collecting three smears and plan solutions.

Experience from the application of the tool

The supervisors stated that the application of the tool itself was easy. During supervision they have trained the district hospital staff to do self-evaluation. The district hospital staff understood the method quickly. The supervisors were enthousiatic and wanted to continue the tool in the routine programme. A few months after the 2nd supervision visit, a director of district hospital expressed during a focus group discussion that his district hospital has detected many more smear-positive tuberculosis patients than in the past when the hospital staff did not yet pay good attention to the tuberculosis suspect criteria and to collect three sputum samples. In the same discussion another director related that he was surprised by the poor performance, checked the indicator again, then called for a special meeting among his staff to find a way to improve the situation.

The staff of most district hospitals appreciated the suggestion of the supervisors to examine 3 smears as spot-collection-spot (one sputum sample is collected on the spot at the first visit, a sputum container is given to the patient for an early next morning sputum sample at home, and a third, second spot, sputum sample is taken when the patient returns the next morning, so only 2 days of visits are required). The staff was used to a spot-collection-collection method in which 3 visits are required. Both ways of examinations have been accepted by the

Thai national tuberculosis control programme(7), but the former has a higher chance of the suspect to complete the examination, and has been advocated internationally (1,9).

DISCUSSION

We decided that two indicators for the quality of tuberculosis screening of district hospital needed to be measured : the proportion of tuberculosis suspects with a positive 1st smear and the proportions of tuberculosis suspects with 2 and 3 smears examined. The reason for the first indicator has been advocated by Crofton et al (9), who stated that "... because chronic cough may be due to smoking, chronic bronchitis, etc., many specimens of sputum will be negative. In good programmes only 5-10 percent of patients usually turn out to have a positive sputum". This has been confirmed by many authors (10,11,12,13,14,15). The cut-off point of 5-10% patients is mostly derived from examination of three sputum smears. In our method we regarded only the first sputum smear to make the calculation from the laboratory register easier, and because often only one or two sputum smear results per tuberculosis suspect are recorded. Since one smear detects about 75% of the positive cases compared to three smears (16,17,18), in our method the cut-off point should have been 75% of 5-10%, which is about 4-8%. Since the range is rather wide, the difference is small and has no operational implications we decided, together with the health service managers, to stick to the 5-10%.

The interpretation of the meaning of a proportion of smear positive suspects lower than 5% and higher than 10% may be clear from point 4 of the description of the tool.

The indicator is less meaningful if the quality of microscopic sputum smear examination at the laboratory is poor. Many false positives or false negatives cause the indicator to be too high or too

low. Periodic quality control of sputum collection, smearing, staining and reading is a prerequisite. A laboratory quality control method developed by our project is described in another article.

The rationale for the indicator proportions suspects with two and three smears examined is given by the fact it is recommended to examine at least three smears of every suspect but that when the first two are positive no third smear is required. Often only one sputum sample is collected, and 25% of the cases that can be diagnosed by examining 3 samples will be missed (19).

In Thailand, all district hospitals have been equipped with a X-ray machine. If a chest X-ray is suggestive for tuberculosis one positive sputum smear usually means that the WHO diagnostic criterium for a smear-positive tuberculosis patient (2,20) is met. Still it is important to collect at least two, better three sputum smears to confirm the diagnosis. To keep the indicator easy to understand the proportion suspects with two smear results as well as the proportion suspects with three smear results is computed. The acceptable levels of performance we chose allow for the fact that sometime only two positive smears are sufficient and to accept the reality that it cannot be perfect. When performance in a health unit improves the acceptable level of performance can be increased.

ACKNOWLEDGEMENTS

REFERENCES

1. International Union Against Tuberculosis And Lung Disease. Tuberculosis guide for low income countries. Third edition. Aachen Paris: Miserear IUATLD, 1994.

2. World Health Organization. Tuberculosis surveillance and monitoring : report of a WHO workshop, Geneva 20-22 March 1991. WHO document WHO/TB 91. 163, 1991 : 1-18.

3. Riley RL, O'Grady F. Airborne infection : transmission and control. New York : Macmillan, 1961.

4. WHO Technical Report Series, No. 552, 1974 (Ninth report of the WHO Expert Committee on Tuberculosis).

5. WHO Technical Report Series, No.290, 1964 (Eighth report of the WHO Expert Committee on Tuberculosis).

6. World Health Organization. Tuberculosis preventive therapy in HIV-infected individuals : A joint statement of the WHO tuberculosis programme and the global programme on AIDS, and the International Union Against Tuberculosis And Lung Disease. Weekly Epidemiological Record, No.49, 3 December 1993 : 361-363.

7. TB division. Tuberculosis manual in the pressing of tuberculosis activities in the HIV pandemic situation. Bangkok : Department of Communicable Disease control, 1993.

8. World Health Organization. Ensuring identification of tuberculosis suspects. In: Managing tuberculosis at the district level. Geneva : WHO. 1993.

9. Crofton J, Horne N, Miller F. Clinical tuberculosis. Hong Kong: Macmillan, 1992.

10. Nagpual DR. Case finding by microscopy. Bull Int Union Tuberc 1968; 41 : 148 - 158.

11. Sriyaphai N, Noochprayoon C, Wongsaroj S, et al. The control and prevention of tuberculosis. Bangkok: Department of Communicable Disease Control, 1989.

12. Daramas S, Konchanart S, Sunakorn B. Second tuberculosis prevalence survey in Thailand 1977-1978. Thai J Tuberc Chest Dis 1980; 4 ; 179 - 191.

13. Payananda V. Third tuberculosis prevalence survey in Thailand 1991-1992. Bangkok : Rongpim Chumnum Sahakorn Karnkaset Haeng Pratedthai, 1992.

14. Chunhasawatdikul B. The case-finding for tuberculosis control. Bull Thai Med Council 1984; 9 : 459-464.

15. Chunhasawatdikul B, Kuaykiartkul P, Daramas S, Kechornnun P. Prevalence of respiratory symptomatics among the OPD patients of the district hospitals. Bull Thai Med Council 1989 ; 5 : 223-238.

16. Nagpual DR. Diagnostic photofluorography and sputum microscopy in tuberculosis case-finding. In : Proceedings of the 9th Eastern Region Tuberculosis Conference and 29th National Conference on Tuberculosis and Chest Disease, Delhi, November 1974. Delhi : Indian Tuberculosis Association, 1975.

17. Nagpaul DR, Pio A, Leowski J, ten Dam HG. Tuberculosis control: A manual on methods and procedures for integrated programs. Washington: Pan American Health Organization, 1986.

18. Baily GVJ, Savic D, Gothi GD, Naidu VB, Nair SS. Potential yield of pulmonary tuberculosis cases by direct smear microscopy of sputum in a district of south India. Buli Wld Hlth Org 1967 ; 37 : 875 - 892.

19. Toman K. Tuberculosis case-finding and chemotherapy, Questions and answers. Geneva: WHO, 1979.

20. World Health Organization. Guidelines for tuberculosis treatment in adults and children in national tuberculosis programmes. WHO document WHO/TB 91.161, 1991.

Figure 1:

FORM 1

NATIONAL TUBERCULOSIS PROGRAMME

TUBERCULOSIS LABORATORY REGISTER

Year _____

Lab. Serial No.	Date	Names (2)	Sex M/F	Age	Name of Treatment Unit	Address (in new patients)	Examination for		Results, Specimen			Signature	Remarks
							Diagnosis*	Follow-up **	1	2	3		

* these are diagnosed new or relapsed cases.
** these are patients on chemotherapy ; enter District TB No.

Figure 2:

TUBERCULOSIS CONTROL

**WORKSHEET FOR TUBERCULOSIS LABORATORY REGISTER INDICATORS
FOR ANALYSIS OF SCREENING PERFORMANCE FOR TUBERCULOSIS
SUSPECTS.**
(instruction on reverse side)

District Hospital: .... Date of Report: __ / __ / __

Supervisors: ....

Page number in lab. register	Results of sputum smears of tuberculosis suspects					
	1st smear		2nd smear		3rd smear	
	positive	negative	positive	negative	positive	negative
Totals	a=	b=	c=	d=	e=	f=

The proportion of suspects with a positive first smear : $100 \times a / (a+b)$ .... ALP* : 5 - 10%
The proportion of suspects with a second smear examined : $100 \times (c+d)/(a+b)$ .... ALP* : 85 - 100%
The proportion of suspects with a third smear examined : $100 \times (e+f)/(a+b)$ .... ALP* : 65 - 85%

* ALP = Acceptable level of performance