Malaysian J Pathol 1992; 14(1): 41 – 43

Bacteriology turnaround time in seven Malaysian general hospitals

VKE LIM MBBS, MRCPath and YM CHEONG* MBBS, MRCPath

*Department of Medical Microbiology and Immunology, Faculty of Medicine, Universiti Kebangsaan Malaysia and * Division of Bacteriology, Institute for Medical Research, Kuala Lumpur.*

Abstract

A turnaround time study was conducted for bacteriological culture tests in seven Malaysian general hospitals. The turnaround times were determined using a specially designed form that was completed by the ward staff. Doctors at these hospitals were also polled to find out whether they were satisfied with the promptness of bacteriological test reporting in their hospitals. The turnaround times obtained from this survey were found to be satisfactory taking into account the constraints of laboratory methods employed. Nevertheless only about a third of doctors expressed satisfaction with the timeliness of the bacteriological test reporting. Doctors and microbiologists should get together and agree on acceptable standards of turnaround times that are practical and reasonable.

Key words: Bacteriology turnaround times, quality assurance

INTRODUCTION

Quality assurance in health care is a concept that is rapidly gaining importance all over the world. The prime movers of quality assurance in health care have been governments, insurance companies, health care professionals as well as the consumers themselves. Governments and insurance companies are concerned with savings and cost-effectiveness in view of the rapidly escalating cost of health care. Health care professionals want to know whether their efforts are achieving their intended goals and the patient wants to be able to receive and select the best possible quality health care. Quality assurance programmes including programmes for laboratories are now regularly conducted in the United Kingdom' and the United States.[2] In Malaysia, the Ministry of Health has been conducting quality assurance programmes since 1986.[3]

Quality assessment programmes in bacteriology have largely been concentrated on the ability of laboratories to isolate and identify bacterial pathogens. There are however very few reports on turnaround time surveys of bacteriology laboratories. Promptness in reporting bacteriological tests may be important in the management of patients. A positive culture and sensitivity report helps clinicians to confirm a diagnosis as well as to initiateor modify therapy. In serious infections a timely report may be life saving. Negative reports are also important as they enable physicians to stop any empirical antibiotics that have been started earlier.

The primary objective of this survey is to assess the turnaround times of bacteriological culture tests in microbiology laboratories of seven Ministry of Health general hospitals. In addition, an attempt was also made to gauge doctors' opinions on the timeliness of bacteriological culture reports in their hospitals.

MATERIALS AND METHODS

The turnaround time survey was conducted in seven government general hospitals during the months of November and December 1991. These seven hospitals were the hospitals selected for a health services research programme on the control of nosocomial infection. Forty five wards in the seven hospitals participated in the survey. These wards were provided with specially designed forms and the nursing staff of the ward were requested to record in these forms particulars of all bacteriological specimens sent from the ward over a two week period. The particulars included (I) patient identification data, (2) nature of specimen, *(3)* the date the specimen was sent from the ward and (4) the date the report was subsequently received by the ward. The turnaround time was defined as the duration in days between sending the specimen and receipt of the final report by the ward. The turnaround time was thus a measure of the total duration involved and included the times for transport of specimen to the laboratory, specimen processing, reporting and delivery of reports. No attempt was made to

Address for correspondence and reprint requests: Professor VKE Lim. Department of Medical Microbiology and Immunology, Faculty of Medicine, Universiti Kebangsaan Malaysia. PO Box 12418. Kuala Lurnpur. Malaysia.

TABLE 1: Turnaround times of bacteriological culture tests in seven general hospitals.

Type of specimen	Number	Mean turnaround time (days)	Range (Days)
Blood culture	624	5.7	2 - 17
Gynaecological	61	3.1	1 - 6
Pus	177	3.2	1 - 15
CSF	54	2.2	1 - 5
Sputum	78	2.6	1 - 5
Stools	163	5.1	1 - 10
Throat swabs	51	2.6	1 - 4
Urine	583	2.2	1 - 15

determine the durations of the various components in the total time. The microbiology laboratories were unaware of the periods of survey. Cultures for mycobacteria were excluded from the survey. None of the hospitals had computerised reporting facilities and specimens and reports were transported by porters.

As part of the control of nosocomial infection research programme, doctors at the study hospitals were requested to complete questionnaires designed to assess their knowledge, attitude and practice in relation to antibiotic usage. In the questionnaire was a section devoted to the support they received from the microbiological laboratory. In this section they were asked to indicate whether they were satisfied or not satisfied with the promptness of the bacteriological reports in their hospitals. The questionnaire surveys were conducted during one of the regular weekly hospital conferences and participation was both voluntary and anonymous.

All data were stored in and analysed by a personal computer using the Paradox Version 3.0 softwarepograrnme(Borland International1988).

RESULTS

The turnaround times of 2,492 bacteriological culture tests were obtained. The specimens involved were blood cultures (624), urine (583), respiratory specimens (258), pus (177), stools (163), gynaecological specimens (61), cerebrospinal fluids (54) and other miscellaneous specimens (572). The means and ranges of the more common types of clinical specimens are shown in Table 1. The results of the opinion poll conducted are shown in Table 2. The mean turnaround times for blood cultures and urine specimens in the seven hospitals are also shown for comparison.

DISCUSSION

The mean turnaround times that were obtained in all seven hospitals can be said to be satisfactory. With the conventional methods for culture and sensitivity testing employed by the laboratories, it would be difficult to shorten tumaround times significantly. Urine cultures for example took an average of 2.2 days from the time the culture was sent to the time the report is received by the wards

TABLE 2: Doctors' satisfaction with promptness of report and mean turnaround times for blood cultures and urine in seven general hospitals.

	% Doctors satisfied with promptness*	Mean turnaround time (days) Blood	Urine
Hospital 1	38 (50)	5.0	2.4
Hospital 2	41 (68)	8.0	1.9
Hospital 3	18 (32)	4.0	2.7
Hospital 4	49 (37)	5.9	2.6
Hospital 5	19 (16)	7.6	1.7
Hospital 6	28 (50)	4.9	3.1
Hospital 7	18 (40)	8.6	2.8
All hospitals	32 (293)	5.7	2.2

*Figures in parentheses indicate the total number of doctors who responded.

A similar audit conducted in one hospital in the United Kingdom showed that urine culture tests had a mean turnaround time of 51.5 hours, a result similar to that obtained in this survey." Many of the negative cultures were reported to the wards the following day. This meant that the cultures were only incubated for one day and this may be inadequate for the more slow growing organisms. Turnaround times for blood cultures and stool specimens were the longest. This is to be expected since it is routine procedure to incubate blood cultures for up to a week before discarding them as negative.

Three laboratories incubated their blood cultures for less than a week and this is probably undesirable since slow growing organisms or low level bacteraemias can be missed. Stool cultures also tend to take a longer time because of the practice of initial culture in Selenite F broth before subculturing onto solid agar. None of the hospitals have computerised laboratory reporting services but from the results obtained it is unlikely that computerisation will make any significant changes to turnaround times.

Despite the satisfactory turnaround times, many doctors at these hospitals are still dissatisfied with the timeliness of bacteriological reporting. The proportion of doctors expressing satisfaction with the timeliness of the microbiological laboratory varied from 18% in two hospitals to 49% in one. Overall only about a third of all doctors expressed satisfaction. A study conducted at a medical centre in the United States on non-bacteriological tests concluded that laboratory performance failed to meet clinicians' standards.[5] This has raised the question whether laboratory turnaround times are indeed too slow or are physicians' expectations unreasonable and impractical ?[6] In this survey the turnaround times have been shown to be satisfactory taking into account the laboratory methods employed. Any attempt to decrease turnaround time, as may occur in laboratories trying to satisfy clinicians' demands, can jeopardise the accuracy of the tests involved. The clinicians' demands for more timely information may partially be met by giving verbal preliminary reports and through closer liaison between the microbiologists and clinicians. In hospitals where there are medically qualified microbiologists, regular clinical rounds by the microbiologist may also lead to a closer working relationship between the laboratory and the clinical doctors. The use of non-cultural methods for the detection of bacterial-like antigen or the use of nucleic acid probes may help to speed up diagnosis time but these methods are often expensive and not readily available at the present time. It would be also very important to establish that the use of a newer method does indeed result in a better quality of patient care. It has been shown in one study that the use of ***Haemophilus influenzae*** antigen detection kits did not make any significant impact on the management of meningitis in a community hospital.' At the moment there are very few if any standards of acceptable turnaround times for bacteriological tests. A nationwide turnaround time for cerebrospinal fluid culture tests is being conducted at the moment and it is hoped that the results of this study would further help to identify in detail areas in which clinicians are dissatisfied with. Hospitals would have to set their own standards based on the nature of health care provided and the facilities available in their laboratories. These standards should be practical and reasonable and based upon discussion and agreement between clinicians and microbiologists.

ACKNOWLEDGEMENTS

The authors wouid like to thank the Director-General of Health of Malaysia for his kind permission to publish this article. The authors would also like to express their sincere and grateful thanks to all the staff of the hospitals who participated in this survey. This survey was supported by IRPA grant 00-41.

REFERENCES

1. Pennington GW. Laboratory accreditation and audit in pathology. The maintenance of standards of pathology in Britain: thecurrent position. J Clin Pathol 1989; 42: 561-2.
2. Hoffman G. Laboratory accreditation and audit in pathology: Medical audit in the United States. J Clin Pathol 1989; 42: 562.
3. Abu Bakar Suleiman. National Quality Assurance Conference: Keynote Address. Berita MMA, Vol 23, No 10, February 1992.
4. Rogers S, Bywater MJ, Reeves DS. Audit of turnaround times in a microbiology laboratory. J Clin Path 1991; 44: 257-8.
5. Hilborne LE, Oye R, McArdle JE, Repinski JA, Rodgerson DO. Use of specimen turnaround time as a component of laboratory quality: A comparison of clinicians' expectations with laboratory performance. Am J Clin Pathol 1989; 92: 613-8.
6. Valenstein P. Turnaround time: Can we satisfy clinicians' demands for faster service? Should we try? Am J Clin Pathol 1989; 92: 705 - 6.
7. Granoff DM, Murphy TV, Ingram DL, Cates KL. Use of rapidly generated results in patient management. Diagn Microbiol Infect Dis 1986; 4 (Suppl 3): S157 - 66.