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Orientation of Potential Trainers and STCs in Antimicrobial Resistance Monitoring

Report of a Workshop
Ahmedabad, India 6–9 June 2001

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1. INTRODUCTION

Antimicrobial resistance has emerged as a major global problem with serious implications for developing countries. Indiscriminate and irrational use of antimicrobial agents provides an ideal environment to resistant organisms to flourish and spread. Places like hospitals where extensive use of antimicrobial agents cannot be avoided have become hotbeds for estabishment and spread of resistant organisms. The resistant organisms increase mortality, morbidity and economic loss due to bacterial diseases. The pace of development of resistance in microorganisms has been faster than that of new antimicrobial agents which are both expensive as well as toxic.

Rational use of antimicrobial agents is one of the effective strategies to contain spread of resistance. WHO has accorded priority to this area and supported various activities on different fronts. Microbiologists play an important role in generation of reliable laboratory data on resistance and its use for development of policies. The laboratory data can be reliable and comparable only if a uniform technique is used. WHO recommends a method that has been standardized by the National Committee on Clinical Laboratory Standards (NCCLS), USA. For analysis of this data, WHO developed a user-friendly software which can be operated on DOS (WHONET4) as well as Windows (WHONET5).

A four days' orientation workshop was held at Ahmedabad for potential trainers and consultants in the field of antimicrobial resistance monitoring from 6-9 June 2001. Nine microbiologists from different parts of India, with considerable experience in antimicrobial resistance monitoring participated. The workshop was facilitated by Dr Rajesh Bhatia, STP-BCT, SEARO, WHO, New Delhi. The list of participants and the programme of work are placed at Annex 1 and 2 respectively.

2. OBJECTIVES

The objectives of this workshop were as follows:

(1) To orient the participants in the NCCLS methodology of antimicrobial susceptibility testing for common bacterial isolates;

(2) To orient the participants in the application of WHO-developed software (WHONET4 and WHONET5);

(3) To utilize the laboratory data for formulation of policy for rational use of antimicrobial agents at local level, and

(4) To develop a mechanism for establishment of a network of laboratories in India for antimicrobial resistance monitoring.

3. INAUGURAL SESSION

The workshop was inaugurated by Dr Devendra Patel, Director, Gujarat Cancer and Research Institute, Ahmedabad, on 6 June 2001. He emphasized the role of antimicrobial agents in containing various infectious diseases. The extensive invasive procedures and prolonged surgeries that are commonly performed now-a-days can yield beneficial results only if possible bacterial infections are taken care of by effective antimicrobial agents. Dr Rajesh Bhatia enumerated the objectives of the workshop and the role that microbiological laboratories are expected to play in development of policy for rational use.

4. PLENARY SESSION

The workshop was designed with several interactive sessions on laboratory aspects of antimicrobial susceptibility testing and hands-on practice for use of computers in data analysis. Professor Madalsa Mathur was elected the Chairperson, Professor Parijath Goswamy the Co-chairperson and Dr Jyoti Bajaj the Rapporteur for the workshop.

4.1 Uniform Methodology for Antimicrobial Susceptibility Testing

Most of the participants attending this workshop had earlier received training in the application of NCCLS method and use of WHONET software. The experience gained by them and difficulties encounterd were discussed and possible solutions finalized. The availability of standard control strains of ATCC as recommended by NCCLS, quality Muellor Hinton agar medium and antibiotic discs were the major problems identified in the use of NCCLS method in Indian laboratories.

Presentations were made on the classification of antimicrobial agents, mechanism of development of resistance, detection of penicillinase enzyme, testing of antimicrobial susceptibility of fastidious organisms, availability of new techniques including E-test and identification of methicillin resistant *Staphylococcus aureus* (MRSA), extended spectrum β lactamases (ESBL) and vancomycin resistant enterococci (VRE).

A large number of variables affect the results of antimicrobial susceptibility testing by NCCLS method. These need to be controlled in every laboratory. Extensive discussions were carried out on this subject and the experience gained by some of the participants who had facilitated such training courses in the recent past was shared with all the participants. These variables pertain to inoculum, medium, temperature and duration of incubation, antimicrobial discs, measuring the diameter of zone of inhibition and use of quality control strains. A logarithm of establishing quality assurance was also discussed.

4.2 Data Analysis Using WHO Software

Use of computers in the analysis of data of antimicrobials susceptibility testing was discussed. This included discussion on basic components of computers, WHONET4 and WHONET5. Various features of these programmes were demonstrated and participants worked on individual computers to gain confidence in using these softwares. The use of computer-generated data in comparing results obtained from various institutions was also demonstrated. A copy each of software WHONET4 (on computer diskette) and WHONET5 (on compact disc) alongwith a manual on WHONET5 were provided to all the participants.

4.3 Assessment of Laboratories Monitoring Antimicrobial Resistance

The WHO proformae to assess the capabilities of laboratories undertaking antimicrobial susceptibility testing and coordinating networking of such laboratories were also discussed to enable the participants to effectively undertake this task as and when required. A copy of these proformae was also provided to all the participants.

The participants agreed to be part of the network of antimicrobial resistance monitoring wherein they will send their data electronically to WHO SEARO every month commencing August 2001. The need for an external quality assessment scheme for NCCLS method was also felt.

4. RECOMMENDATIONS

The following recommendations were made:

To Participants

(1) All participants will commence use of NCCLS method for antimicrobial susceptibility testing.

(2) All participants will use WHONET4 or WHONET5 to store, analyze and retrieve the data generated through antimicrobial susceptibility testing in their laboratories.

(3) All participants will electronically transfer their data and configuration files of WHONET on monthly basis to WHO/SEARO for comparison.

To WHO

(1) WHO will continue to provide all technical support to participants in implementing NCCLS method of antimicrobial susceptibility testing, use of WHONET in data analysis.

(2) WHO will procure ATCC standard strains for quality assurance of NCCLS method and provide these to all the participants.

(3) WHO will collect, collate and analyze data provided by all the participants and provide a feedback to them.

(4) WHO will make use of the participants of this workshop in conducting courses on ARM as well as providing technical support.

Annex 1

LIST OF PARTICIPANTS

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Annex 2

PROGRAMME

6 June 2001

0930-1000 hrs	**Inauguration** • Welcome • Objectives	
1000-1200 hrs	**Status reports by participants** • Antimicrobial susceptibility testing • NCCLS • Compilation of data • WHONET • Utilization of data for rational use of antimicrobials • Training courses organized	Participants
1200-1300 hrs	• Utility of NCCLS and WHONET in ARM • Training course in ARM • Curriculum	Dr Rajesh Bhatia
1400-1515 hrs	Classification of antimicrobial agents and their utilization in different linical settings	Dr RL Ichhpujani
1530-1700 hrs	Various methods of antimicrobial susceptibility testing Advantages vs disadvantages	Prof Reba Kanungo

7 June 2001

0930-1100 hrs	Variables that are controlled in NCCLS method • Media	Mr Ravinder Chhaya/Dr Rajesh Bhatia

	• Discs • Inoculum • Incubation • Interpretation • Controls	
1115-1300 hrs	Variables contd.	Mr Ravinder Chhaya/Dr Rajesh Bhatia
1400-1530 hrs	Troubleshooting for NCCLS method	
1545-1700 hrs	Penicillinase detection methods	Prof Parijath Goswamy
8 June 2001		
0930-1300 hrs	WHONET4	Dr Rajesh Bhatia
1400-1700 hrs	WHONET5	Dr Rajesh Bhatia
9 June 2001		
0930-1300 hrs	Working on computers	Participants
1400-1600 hrs	Discussions on NCCLS method, organization of training courses, assessment of participants and AST through WHO questionnaires	
1600-1700 hrs	Valedictory session	