DOWNLOAD PDF MACRO AND MICRODILUTION METHODS OF ANTIMICROBIAL SUSCEPTIBILITY TESTING SADAF QAIYUMI

Chapter 1 : TÃ i liá»‡u Antimicrobial Susceptibility Testing Protocols ppt

Download Citation on ResearchGate | On May 22, , Sadaf Qaiyumi and others published Macro- and Microdilution Methods of Antimicrobial Susceptibility Testing }.

With the widespread use of antimicrobial chemotherapy, the nature of infectious diseases gradually changed and that created new challenges to those concerned with the diagnosis and treatment of infectious diseases. Consequently, clinical laboratories were being asked to perform increasingly sophisticated procedures. To help clinical pathology laboratories meet those new challenges, a number of industries were developed to provide supplies and equipment that labora- torians could no longer make or obtain for themselves. Standardization of methodology was essential for such commercial endeavors to be successful. Performance standards were needed in order for each laboratory to judge the quality of different products. Regulatory agencies were also being asked to monitor the quality of products being sold to diagnostic laboratories. Government agencies were being forced to provide standards for judging the quality of different reagents and equipment; for obvious reasons, laboratory professionals wanted to be involved in writing such standards. In the mids a group of interested individuals began discussions that led to the concept of an independent organization that could prepare standards that would be acceptable to everyone using them. The name change effective January was felt to be a more accurate representation of the organization. Clinical laboratory standards were to be prepared by committees composed of experts from academia, 2 Antimicrobial Susceptibility Testing Protocols government, and industry. Once a standard was written and approved by the CLSI council, it was to be published as a proposed standard, and all interested individuals were asked to make written comments or suggestions. After one year of peer review, the subcommittee was asked to respond to all comments and to make appropriate changes or to explain in writing why some suggestions were not accepted. By this process, each standard would be a true consensus document. After the initial review process, each document would be advanced to the status of an approved standard. When important technical changes are needed, the document should be revised and then go through the consensus review process again. Each document is reviewed every three years and either discontinued or revised. In that way, CLSI standards are living documents that are updated as our understanding of the subject improves. CLSI documents are now accepted throughout the world, and regulatory agents often cite CLSI standards as the accepted state of the art. In the area of microbiology, the antimicrobial disk diffusion susceptibility test was a natural subject. Just before that time, there was a major effort to standardize antimicrobial suscep- tibility tests on an international level, through the World Health Organization. Sherris and Ericsson coordinated collaborative studies the results of which were published in [1]. Their extensive labors helped to standardize broth dilution and agar dilution antimicrobial susceptibility tests; microdilution susceptibility tests were not available at that time. Disk diffusion tests had been carefully standardized for use in the Scandinavian countries by Ericsson [2] and for use in the United States by Bauer et al. A variety of other methods had been advocated, but there was little effort to control important variables such as the inoculum density, agar medium, incubation con- ditions, etc. The standardized disk tests of Ericsson [2] and of Bauer et al. The most popular method utilized one or more disks for each agent high- or low- content disks and simply reported a strain to be susceptible if there was any zone of inhibition and resistant if it grew up to the disk. That was the method that the U. Food and Drug Admin- istration FDA approved for inclusion in the package insert that was provided in each package of antibiotic disks [4]. A chaotic situation remained because there was no national effort to bring some degree of standardization to the disk diffusion susceptibility test procedure. In , I was given the honor to chair a CLSI subcommittee on antimicrobial disk susceptibility tests. After interviewing a number of opinion leaders, those that had the foresight to understand the need for standard methodologies were appointed to the subcommittee and serious discussions of methodologic details pursued. In principle, the method of Bauer et al. Four years later, a document was prepared and given the designation of M2, the second standard written for the

Microbiology Area Committee. Quality control guidelines were also included even though quality control was unknown in clinical microbiology laboratories at that point in time. In the interim, the FDA conducted its own survey and concluded that the methods of Bauer et al. The M2 document has undergone numerous revisions: Barry cochaired a subcommittee that provided a reference that manufacturers of dehydrated media could use to help standardize Mueller-Hinton agars CLSI M6. That ongoing subcommittee has successfully improved the performance of Mueller-Hinton agar sold in the United States. Thornsberry chaired a subcommittee to standardize agar and broth dilution tests of aerobic microorganisms [7]. Broth microdilution methods were being popularized at that time, and the subcommittee was able to standardize that procedure before it was widely used and before inappro- priate procedures could be well engrained. This document, M7, is now in its seventh edition.

DOWNLOAD PDF MACRO AND MICRODILUTION METHODS OF ANTIMICROBIAL SUSCEPTIBILITY TESTING SADAF QAIYUMI

Chapter 2 : - NLM Catalog Result

Which is more reproducible macrodilution and microdilution methods? Sadaf Qaiyumi. Read. Rapid systems and instruments for antimicrobial susceptibility testing of bacteria.

What are the desired demographics? Where is the information? A minimum of a core team is required to successfully cover all areas of involvement. These core team members include infection control, pharmacy, microbiology, and administration. Additional members such as a medical doctor, who represents the institution specialties, can be added if necessary. The following points should be considered: The results of this would fall under the responsibility of the institution team administrative representative. Surveillance of formulary functionality within the institution: The pharmacist team member would utilize the antibiogram to evaluate the efficacy and cost-effective nature of the available institution therapies. Surveillance of emerging pathogen specifics: The infectious disease physician would participate in the development of the antibiogram to track the incidence of pathogen activity. Determine frequency of the antibiogram development. Is it a rolling report? What is the time frame necessary to completely exhibit trending? The minimum time frame to best exhibit a trend is 6 months. If data is not available for 6 months, begin assessing data at 3 months. These terms may be used interchangeably. The primary specimen information required in an antibiogram must include: Delineation of specimen source into larger groups is necessary to separate appropriate therapy methods urinary antimicrobics vs. Susceptibility-Testing Protocols for Antibiograms and Preventive Surveillance Secondary demographics that can be of value in final data assessments are: Antimicrobial susceptibility testing AST method and result. Ask the team the following question: Does the medical staff utilize minimum inhibitory concentration MIC results? If MIC results are not utilized, then use the percent susceptible S , intermediate I , or resistant R on the antibiogram. Routinely calculate the percent susceptible, excluding intermediate. The antibiogram may be divided into drug classes over a more broad range of antimicrobials if the formulary is not strictly observed by the prescribing physicians Individual: Select drugs in use at the institution can be listed. Only those antimicrobial agents on formulary should be listed if enforcement of the formulary is required. This list may or may not include restricted antimicrobials. These isolates may be different for selected specimens or patient service areas. Do not include isolates with very low numbers 7. Duplicate results can skew the data and should be avoided. For example, two blood cultures with the same organism isolate and susceptibility pattern from the same patient within three days would constitute a duplicate culture. Inappropriate organism and antimicrobial agent combinations such as E. Known innate resistance patterns such as P. Isolates from surveillance cultures. With these needs in mind, the design of the antibiogram content is complete. The next stage is the data analysis or analytic phase. Larger sized institutions will have more data mining opportunities. A higher level of computerization within the institution will also ease the data mining process. In any case, the data can be retrieved using manual techniques or computerization. Manual data retrieval will require a larger time obligation, as all laboratory and microbiology records will need to be handled manually. Automated data retrieval will depend greatly on the available computer systems within the institution. The first step is to look at the needs of the internal customers team members and decide what information is necessary to accomplish the team goals. The second step is locating the information? In an institution with a computerized information system, the first place to look for the data is the available reports that may be generated from within that system. The hospital information system HIS will generally have patient history and demographics. This system also will have current and historical laboratory patient reports available for data mining either on a manual or electronic basis. The LIS will provide current laboratory testing information through a direct link from the testing instruments. Most LISs are interfaced to the individual instruments that provide actual testing results. In some cases, where the electronic interface is not present, the result and demographic data are entered manually by the technologist performing the test. The LIS is the primary generator of patient reports and the instrument data manager usually produces the lab

report. The patient result is an LIS striped down version of this showing the physician only the filtered results that are relevant to the patient. Data are analyzed through the two expert systems resident in EpiCenter. These tools also provide the ability to routinely monitor events and then use EpiCARE to set up sentinel event alerts. The system integrates seamlessly with the existing LIS eliminating duplicate data entry. This second generation expert system assigns a phenotype to each isolate based on the identification of the organism and the MIC distribution of the antibiotics tested against that organism. The database is comprised of over 2, phenotypes and 20, MIC distributions. The AES matches the phenotype with the resistance mechanisms known to be associated with that phenotype. This allows for biologic and therapeutic corrections to be made to the microbiology report. AES also allows for the detection of rare phenotypes and phenotypes yet to be described, obviously important in monitoring and reporting emerging antibiotic resistance. The AES is kept current with software upgrades that allow for the incorporation of new phenotypes and resistance mechanisms and the expected distribution of MICs can be modified, as new information becomes available, to insure the detection of known resistance mechanisms if the MIC changes over time. Unlike other expert systems, AES validates all results by assigning them to a known phenotype. This insures results are released to clinicians in the shortest possible time frame. Increased range of dilutions allows for the detection of creeping resistance. Software is used for the generation of antibiograms and MIC trending reports. Expert systems, including the second generation Advanced Expert System, validate results in addition to assigning a phenotype with associated resistance mechanisms to each organism isolated in the laboratory. An Electronic Database such as TSN The Surveillance Network has accumulated susceptibility and identification statistics from individual institutions and globally to produce resistance statistics. Susceptibility testing Antimicrobial Susceptibility Testing Protocols of patient isolates is conducted on-site by each participating laboratory as a part of their routine diagnostic testing. The available information fields will restrict or enhance data accessibility. The field contains an information packet that identifies a data group or searchable statistic. See the sample with identified fields below. Collection Date Specimen Number.

DOWNLOAD PDF MACRO AND MICRODILUTION METHODS OF ANTIMICROBIAL SUSCEPTIBILITY TESTING SADAF QAIYUMI

Chapter 3 : Table of contents for Antimicrobial susceptibility testing protocols

An Overview of the Clinical and Laboratory Standards Institute and its Impact on Antimicrobial Susceptibility Testing, A. L. Barry Antimicrobial Classifications: Drugs for Bugs, C.B. Calderon, and B. Perdue Sabundayo Disk Diffusion Tests and Gradient Methodologies, A. Wanger Macro and Microdilution Methods of Antimicrobial Susceptibility.

Reviews Summary The clinical microbiology laboratory is often a sentinel for the detection of drug resistant strains of microorganisms. Standardized protocols require continual scrutiny to detect emerging phenotypic resistance patterns. The timely notification of clinicians with susceptibility results can initiate the alteration of antimicrobial chemotherapy and improve patient care. It is vital that microbiology laboratories stay current with standard and emerging methods and have a solid understanding of their function in the war on infectious diseases. Antimicrobial Susceptibility Testing Protocols clearly defines the role of the clinical microbiology laboratory in integrated patient care and provides a comprehensive, up-to-date procedural manual that can be used by a wide variety of laboratorians. The authors provide a comprehensive, up-to-date procedural manual including protocols for bioassay methods and molecular methods for bacterial strain typing. Divided into three sections, the text begins by introducing basic susceptibility disciplines including disk diffusion, macro and microbroth dilution, agar dilution, and the gradient method. It covers step-by-step protocols with an emphasis on optimizing the detection of resistant microorganisms. The second section describes specialized susceptibility protocols such as surveillance procedures for detection of antibiotic-resistant bacteria, serum bactericidal assays, time-kill curves, population analysis, and synergy testing. The final section is designed to be used as a reference resource. Chapters cover antibiotic development; design and use of an antibiogram; and the interactions of the clinical microbiology laboratory with the hospital pharmacy, and infectious disease and control. Unique in its scope, Antimicrobial Susceptibility Testing Protocols gives laboratory personnel an integrated resource for updated lab-based techniques and charts within the contextual role of clinical microbiology in modern medicine. Drugs for Bugs, C. Rector Anaerobe Susceptibility Testing, D. Verma Serum Bactericidal Testing, H. Berg Pharmacy and Microbiology: Perdue Sabundayo and C. Painter Reviews "â€¦ exceptionally well written both in clarity and through illustration. I believe it will be of great value for clinical microbiologists and pathologists, physicians, veterinarians, and pharmacists, medical and veterinary technologists, molecular biologists, infectious disease epidemiologists, as well as infection control practitioners and hospital administrators. Stadtlander, University of St. Thomas, Minnesota in Microbe, January Instructors.

DOWNLOAD PDF MACRO AND MICRODILUTION METHODS OF ANTIMICROBIAL SUSCEPTIBILITY TESTING SADAF QAIYUMI

Chapter 4 : TÃ i liá»‡u Antimicrobial Susceptibility Testing Protocols ppt - TÃ i liá»‡u text

Table of Contents for Antimicrobial susceptibility testing protocols / editors, Richard Schwalbe, Lynn Steele-Moore, and Avery C. Goodwin, available from the Library of Congress. Bibliographic record and links to related information available from the Library of Congress catalog.

Isolation and Identification of K. The isolated strains were identified phenotypically using API 20E Biomerieux, France and then confirmed genotypically through amplification of the specific phoE gene using primers and cycling conditions listed in Table 1. Genotyping of Clinical Isolates Clonal relatedness between clinical isolates of K. The primer was obtained from Macrogen Korea, Geumcheon-gu, Seoul. The PCR fingerprint profile was analyzed using Dice similarity coefficient. Cluster analysis was performed based on the unweighted pair group method with arithmetic averages UPGMA at position tolerance at 0. Antimicrobial Susceptibility Testing All K. Also, 3 genes oqxA, oqxB, and qebA encoding quinolone efflux pump proteins were screened using primers and cycling conditions listed in Table 2. Primer sets and PCR cycling conditions used for amplification of genes encoding quinolone resistance. The bacterial suspension was placed in a boiling water bath for 10 min to lyse the bacterial cells. The supernatant, which contains total genomic DNA, was transferred to a new sterile tube using DNase-free tips. Phenotypic and Genotypic Identification of K. Other detected biotypes were , , and , which occurred at a prevalence of 3. The lowest detected biotypes were , , , , , , , and , which each occurred at a prevalence of 0. Genotypic confirmation of phenotypically identified isolates through amplification of the K. The genotyped K. Representative DNA fingerprint pattern of K. Fingerprint Pattern Analysis A UPGMA dendrogram generated according to Dice similarity coefficient revealed that the 85 fingerprint profiles were related to 67 different profiles, including 67 isolates with 18 different combined profiles that included 42 isolates. Two isolates K and K within phylogenetic group A had the same fingerprint pattern. Phylogenetic group B contained the remaining isolates. Other identical genotypes also revealed different biotypes, as shown in Figure 2. Antibiotic susceptibility of K. Resistance pattern and genetic profile of quinolone and aminoglycoside resistant K. A rmtB variant was not detected. The gene encoding Qnr protein detected least often was qnrC: Representative PCR products of detected quinolone resistance genes. Discussion Aminoglycoside-modifying enzymes are the most important determinants of aminoglycoside resistance among K. The qnr genes encode proteins that protect DNA gyrase and topoisomerase IV from inhibition by quinolones and have recently been found worldwide [32]. The current study examined the prevalence of Qnr proteins among K. The qnrA gene was not detected, which was consistent with Yang et al. We found that qnrC was represented by only a single isolate, which was consistent with findings from the recent Turkish and Tunisian studies that failed to detect qnrC among quinolone-resistant K. We conclude that plasmids carrying qnr genes were highly spread in Egypt and China, probably due to misuse of quinolones in clinical settings. Interestingly, Yuan et al. Thus, high resistance rates to quinolones may be expected among K. Genotypic identification of K. This difference may be due to a mutation in the phoE gene of our isolates. Screening of qnr genes revealed that qnrB was the most prevalent, followed by qnrS. Conflicts of Interest The authors declare that there are no conflicts of interest regarding the publication of this paper. Acknowledgments The authors thank Mr. Youhana Ekladious Takyi, Mrs. Wafaa Ibrahim Noor, Mr. Khalid Kamel Abd-Elkhalek, and Mr. View at Google Scholar S. View at Google Scholar J. View at Google Scholar M. View at Google Scholar C. View at Google Scholar N.

Chapter 5 : Antimicrobial Susceptibility Testing Protocols - PDF Free Download

Chapter 11 Susceptibility Testing of Mycobacteria Barbara A. Brown-Elliott, Samuel Cohen, and Richard J. Wallace, Jr. Chapter 12 Methods for Determining Bactericidal Activity and Antimicrobial Interactions.

DOWNLOAD PDF MACRO AND MICRODILUTION METHODS OF ANTIMICROBIAL SUSCEPTIBILITY TESTING SADAF QAIYUMI

Chapter 6 : Antimicrobial susceptibility testing protocols - Webcat Plus

Add your e-mail address to receive free newsletters from SCIRP.

Chapter 7 : Antimicrobial Susceptibility Testing Protocols - CRC Press Book

Abstract. A comparative study of broth macro- and microdilution methods for susceptibility testing of fluconazole, itraconazole, flucytosine, and amphotericin B was conducted with yeasts.

Chapter 8 : EUCAST: AST of bacteria

An overview of the Clinical and Laboratory Standards Institute (CLSI) and its impact on antimicrobial susceptibility tests / Arthur L. Barry --Antimicrobial classifications: drugs for bugs / Cassandra B. CalderÃ³n and Beulah Perdue Sabundayo --Disk diffusion test and gradient methodologies / Audrey Wanger --Macro- and microdilution methods of.

Chapter 9 : Antimicrobial susceptibility testing protocols in SearchWorks catalog

Contents: An overview of the clinical and laboratory standards institute (CLSI) and its impact on antimicrobial susceptibility tests / Arthur L. Barry -- Antimicrobial classifications: drugs for bugs / Cassandra B. CalderÃ³n and Beulah Perdue Sabundayo -- Disk diffusion test and gradient methodologies / Audrey Wanger -- Macro- and microdilution.