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Research Article

To study the prescription practices after the availability of antibiotic sensitivity test (ast) reports in a tertiary care hospital

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Abstract

Background & objectives: The clinical value of a microbiology report has always been queried. There are various factors that influence a prescription in the treatment of patient after admission to the hospital. This study was undertaken to study factors that guide prescription practice after the availability of antibiotic sensitivity report and to study the pattern of choice of empirical therapy among patients admitted with various infections.
Methods: This is a hospital based cross sectional study done in a tertiary care hospital. 139 patients were included in the study. The reasons influencing the physician to continue the empirical therapy even after the availability of AST reports were collected using a proforma.
Results: A total of 139 patients were analysed in this study. Among 139 patients, 122 (87%) patients were started on empirical therapy. A follow up could be made only for 59 (48%) patients, the rest were either discharged or referred before a follow up was made. Among 59 patients, 30 (50%) patients were continuing empirical therapy even after the availability of AST reports, for 21(36%) patient's antibiotic was changed as per AST report. With a predesigned proforma, various opinions of the physicians were obtained and the major reason for continuation of empirical therapy was patient's condition improving with the existing drug and a change of antibiotic was not necessary.
Interpretation and conclusions: Analysis of the data showed that majority of the physicians were continuing empirical therapy even after availability of AST reports as they felt patient improved with empirical therapy or the drug that is effective as per AST report is expensive. The study also revealed that third generation cephalosporins is more commonly used as an empirical choice of treatment.
Key words: Antibiotic sensitivity testing, empirical therapy, prescription practice

1. Introduction

Antibiotic sensitivity test (AST) reports in many hospitals have not significantly influenced physicians' choice of antibiotic therapy. The clinical value of microbiological investigations has been always questioned. Correlations between antibiotic sensitivity testing and clinical outcome are ill defined[1]. Physicians often fail to prescribe the appropriate antibiotic after the antibiotic sensitivity results are available. In some instances, clinicians initiate an antibiotic early in the course of infection to improve the outcome of the patient, but continue the same drug even when the cause of infection and drug to which it is effective is known by AST reports. Empirical therapy is started on admission when the causative organism is not known. After AST reports become available, treatment should be changed to narrow spectrum antibiotic which has specific target of action to minimise the emergence of resistance[2]. Continuing empirical therapy can lead to overuse of drugs exposing organisms to broad spectrum antibiotics leading to drug resistance[2].

A study done by David Tompkins[3] about microbiology antibiotic sensitivity reports through questionnaire to physicians revealed that 34% of reports gave unexpected findings, 28% resulted in a change of therapy and most of the investigations (83%) were seen as beneficial to the patients. In another study conducted by Samir K Saha[4], 27% of the cases, a change in management to an agent active for treatment of the isolate was made after receipt of the test results. However, in no case was therapy changed from a second-line to a first-line agent, even if the isolate was reported on the day after presentation to be sensitive to first-line therapy. Hence, this study was undertaken in our hospital to study the factors that guide prescription practices of the physicians after the availability of antibiotic sensitivity reports. An attempt was also made to know the choice of empirical therapy for different infections.

2. Materials & Methods

This study was a hospital based cross-sectional study done during the months of June and July 2012. Samples (blood & body fluids, urine, sputum & pus) from inpatients sent for culture and sensitivity during this period were included in the study. Samples showing significant growth of organisms were subjected to antibiotic sensitivity testing. All outpatients and samples showing no growth were excluded from the study.

2.1 Sampling procedure: Standard guidelines were followed for sample collection. Samples were processed according to standard Microbiological procedures[5]. Samples showing growth were subjected to antibiotic sensitivity testing as per CLSI guidelines[6]. Once AST report became available, data regarding empirical antibiotic if started was collected from the patient's record. Follow up of the patient was done the next day after the AST report reached the clinician. If the patient was receiving the same empirical antibiotic even after receiving the AST report, an attempt was made to know from the physicians with a predesigned proforma why empirical therapy was continued.

2.2 Survey instrument: A predesigned Proforma was used to record AST report along with other details which was traced to the concerned patient's case sheet and treating physician.

2.3 Data analysis: Data was analyzed using Microsoft Excel 2010 version and qualitative outcomes are summarized using count and percentages and quantitative outcomes are summarized using mean, median, and mode.

2.4 Ethical considerations: Institution ethics committee approval was obtained before starting the study.

3. Results

A total of 158 samples from 139 patients were studied between June –July 2012. A survey was done for each patient's sample to the concerned physician after the AST report was issued. The maximum samples processed for AST was urine (34.8%), pus (25.3%) and blood (17.7%). Other samples received are sputum, wound swab, ear swab and throat swab. (Table 1)

Table 1: Shows the various types of samples

Type of Sample	Number (%)
Blood	28 (17.7%)
Pus	40 (25.3%)
Urine	55 (34.8%)
Wound swab	10 (6.3%)
Others	8 (5.1%)
Total	158 (100%)

Data regarding the prescription method (empirical therapy) before the availability of AST was collected from the patient's record. This was done on the same day of issue of the report.

Amongst a total of 158 samples from 139 patients, 122 (87%) patients were started on empirical therapy and 17 patients were not started on empirical antibiotic before AST. Amongst 122 patients who were started on empirical therapy, 63(52%) patients were discharged or referred to other hospital before a follow up could be done about the prescription method.

A total of 59 (48%) patients were followed up regarding the prescription method. Follow up of the patient was done on the next day to notice the impact of AST report on the prescription method. Among 59 patients who were followed up, 30 patients were continuing empirical antibiotic even after receiving the AST report, for 21 patients antibiotic was changed according to the AST report and for 8 patients empirical antibiotic was stopped. Since we are concerned about patients on empirical therapy an attempt was made to know why it was being continued on these 30 patients with the concerned physicians. The reason behind each prescription was collected from the treating physician using a proforma and the reasons are given in Table 2.

Table 2: Showing Physicians' response for continuing empirical antibiotic

Reasons	Number of responses*
Patient factor	24
Drug factor	9
Delay in getting report	18
Reasons unknown	9

*multiple responses

The reasons given by various physicians for continuing empirical therapy were grouped into: 1) Patient factor – patient's condition improving on empirical therapy. 2) Drug factor – The drug that is effective as per AST report is expensive when compared to empirical drug. 3) Laboratory factor – The delay in getting AST reports made the physicians to overlook the report.

An attempt was made to find out the empirical choice of antibiotic for various infections and the results are given in Table 3. Third generation cephalosporin was found to be the most common empirical choice of antibiotic for most of the infections.

Table 3: showing Physicians' choice of empirical antibiotic

Provisional diagnosis	No.	Preferred empirical choice of antibiotic
Enteric fever	14	Third generation cephalosporins
Respiratory tract infections	19	Third generation cephalosporins
Urinary tract infections	8	Fluoroquinolone
Surgical cases	41	Third generation cephalosporins
Skin infections	3	Cephalosporins
Fever for evaluation	21	Cephalosporins

4. Discussion

There is conflicting evidence regarding the link between laboratory antimicrobial susceptibility reporting and antibiotic prescribing pattern[7,8,9]. Due to varied reasons such as long turnover time for generating the AST report, poor communication between the laboratory and physician, morbid condition of the patient the clinician might continue using the empirical antibiotic even after getting an AST report[4,8]. In this study we tried to explore those reasons that would influence the prescription practice of the physicians. The major reason given by the physicians is that patients were improving with the empirical antibiotic and they felt there was no need to change. We need an insight on this as continuation of empirical antibiotic causes a huge economic burden on the government as well as on the patient. Another major reason was delay in getting AST reports by the physicians which made them to overlook the report. This can be partly overcome if there is a good communication between microbiologists and physicians. This study also found that the majority of the patients were receiving third generation cephalosporins (ceftriaxone or cefotaxime) as empirical choice of therapy for any kind of infection. Hence, proper knowledge on judicious use of antibiotics and resistance pattern in the local set up will reduce the burden on antibiotic resistance. There are only a few studies done to know the impact of AST reports on clinical practice[3,4], hence research has to be carried out in this area to explore the reasons and the ways to overcome it.

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