Research Article

Point prevalence study–assessment of antibiotics given in critical care units

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Abstract

Proper and timely use of antibiotics is mandatory to control infectious diseases and strict monitoring of it is essential to prevent emergence of drug resistance. The study was performed in teaching hospital with all medical specialities. Point Prevalence study was done once a month for four months in the year 2015. Data on demographics, infections and antibiotic therapy were gathered. The antibacterial therapy was assessed according to local Hospital Antibiotic Policy. A total of 69.23% of the 78 patients were receiving antibiotic therapy. 34.2% of patients were receiving antibiotic therapy that was not according to the Hospital Antibiotic Policy. Prevalence study proved to be helpful in updating the Hospital Antibiotic Policy.

Keywords: Prevalence study, Hospital Antibiotic Policy, ICU.

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Received Date: 06/07/2015 Revised Date: 29/07/2015 Accepted Date: 24/08/2015

Access this article online

Quick Response Code:

Website: www.statperson.com

DOI: 04 Sept 2015

INTRODUCTION

Following the discovery and widespread use of sulphonamides and penicillin in mid 20th century, the year between1950 – 1970 saw a "golden Age". Many infections that were once serious and potentially fatal could now be controlled and cured. This success encouraged the overuse and misuse of antibiotics[1]. Resistance to antimicrobial drugs is a serious problem and is increasing throughout the world[2]. Antimicrobials are prescribed in up to 1/3rd of all hospital inpatients. Most of the times the antimicrobials prescribed are inappropriate[3,4]. Therefore it can be safely inferred that hospitals play a vital role in the development of antimicrobial resistance. Resistance and spread among bacteria is generally the result of selective antibiotic pressure. Resistant bacteria are spread among patients and resistance factors spread among bacteria, both occurring more frequently in health care setting[5,6]. Inappropriate and uncontrolled use of antibiotics including over prescribing, administration of suboptimal doses, insufficient duration of treatment, and misdiagnosis leading to inappropriate choice of drug contribute to this[5,6]. Hence to control the development of resistance, a restrictive antimicrobial policy in combination with effective infection control measures to prevent the spread of resistant microorganisms is advisable[7,8,9]. The challenge now is to find a balance between two conflicting goals – To provide therapy to documented or presumed infection and To minimise the antimicrobial use to decrease the emergence of antimicrobial resistance and reduce costs[10]. This can be done by effective "antimicrobial stewardship". McGowan and Gerding in their article in 1996 asserted that appropriate use of antimicrobials might revert or even reverse the trends in microbial resistance[11]. The importance of Antimicrobial policy cannot be asserted much, but implementation and regular monitoring of the same have to be measured. As our hospital has come out with a new Antimicrobial policy the monitoring of it and measuring the effectiveness should be done. This study will be done by repeated prevalence. The usefulness of Prevalence surveys has been proved by articles[10,11,12].

How to site this article: T K Sukumar, Boloor R, Kishor N. Point prevalence study–assessment of antibiotics given in critical care units. *International Journal of Recent Trends in Science and Technology* September 2015; 16(2): 329-331 http://www.statperson.com (accessed 06 September 2015).

AIMS AND OBJECTIVES

Assessing adherence of antibiotic therapy to the local Antibiotic Policy, Cause of Non Adherence

MATERIALS AND METHODS

This study was done in the MICU, NICU and PICU of Father Muller Medical College, which is a Multispecialty Hospital. This prevalence study was done once in a month for four months. All patients present in the above mentioned ICUs at 6pm on the day of survey were included in the study. The required medical and demographic data was collected from the nursing and medical records. The data collected included – Age, Sex, ICU, Medical Speciality, Infection present and Details of Antibiotics he / she was on. Anti - tubercular drugs and Anti retroviral drugs were excluded from the study. The assessment was of Antibiotic therapy was based on the Local Antimicrobial Policy, which was written by local team of consultant microbiologists, pharmacologists and physicians. The following variables were assessed

Antibiotics administered: Presence or Absence of infection. Antibiotics administered: Dosage, and selected antibiotic According / Not according to local Antimicrobial Policy

RESULTS

A total of 78 patients admitted in the ICU (MICU, NICU, PICU) during the four surveys were included in the study. The males (62.8%), formed the majority if the patient population while the females (37.2%), formed the minority. A total of 46 patients were present in MICU, 23 in NICU, 9 PICU. 40.1% of patients were between the age group 51-80 and 30.7 were newborns i.e. 0-28 days. 8 patients were of age more 29 days and less than 2 years. 2 patients were 2 to 18 years old. Among 78 patients 54 patients (69.23%) were on Antibiotic therapy. In the study it was noted that a 38 patients of the total 78 patients did not have any active infection at the time of the study. 34.2% i.e. 13 patients of these 38 patients received antibiotics. When it was distributed according to ICUs, majority of patients getting antibiotics in the absence of infection were PICU 50% followed by NICU 33% and MICU 31.5%. Antibiotic administered that was not in accordance to the local Hospital Antibiotic Policy was seen in 6 patients in the study, and wrong dosage was not found.

DISCUSSION

The importance of Antibiotic policy cannot be asserted much, but implementation and regular monitoring of the same have to be measured. As our hospital has come out with a new Antibiotic policy the monitoring of it and measuring the effectiveness should be done. The usefulness of Prevalence surveys has been proved by many articles[10,11,12]. In the study we noted that the most number patients not getting antibiotics according to hospital Policy belonged to paediatric age group. This result is similar to the result got in the prevalence study carried out by Willemsen I *et al.*[13] This was because a definitive Policy is difficult to be followed as the paediatricians believe on giving prophylactic antibiotics to preterm babies to prevent infections. This study demonstrated that even with a Hospital Antibiotic Policy (HAP) there were few cases where antibiotics were given in the absence of infections. This was brought to the notice of the concerned and corrective steps were taken by not only stopping the same but also few shortcomings of the Antibiotic Policy were highlighted i.e. not all the antibiotics and all the infections were included the Antibiotic Policy.

CONCLUSION

This study demonstrated that even with a hospital antibiotic policy, there is variation in the antibiotic administered based on the experience and knowledge of the treating physician. Hence, it can be safely said that HAP is not a rigid rule but a set of "Guidelines" that need to be regularly updated according to the needs. Regular monitoring of the Hospital Antibiotic Policy by the Hospital Infection Control Committee is mandatory for the smooth functioning of the health care centres, benefit of the patients and also in reducing the occurrence of Multi Drug Resistance bacteria in long term.

Table 1: Distribution according to Intensive Care Units

ICU	Frequency
MICU	46
NICU	23
PICU	9

Table 2: Distribution according to age and sex

Male	**49**
Female	29
Total	**78**

Table 3: Distribution according to Age

Age	Frequency
0 – 28	24
›28days – 2 yrs	8
›2yrs – 18yrs	2
›18yrs – 50yrs	12
›50 yrs	32
Total	**78**

Table 4: Patient receiving Antibiotic in absence of infection

ICU	Patient without infection	Pt without infection but on Antibiotic
MICU	19	6
PICU	4	2
NICU	15	5

REFERENCES

1. Kunin, C. 1993. Resistance to antimicrobial drugs. Ann. Int. Med. 118:557-561.
2. Neu, H. 1992. The crisis in antibiotic resistance. Science257:1064-1073.
3. Dunagan WC, Woodward RS, Medoff G, *et al*. Antimicrobial misuse in patients with positive blood cultures. Am J Med. 1989; 87(3):253–9.
4. Jenkins TC, Sabel AL, Sarcone EE, Price CS, Mehler PS, Burman WJ. Skin and soft-tissue infections requiring hospitalization at an academic medical center: opportunities for antimicrobial stewardship. Clin Infect Dis. 2010; 51(8):895–903.
5. Goossens H. Antibiotic consumption and link to resistance. ClinMicrobiol Infect. 2009; 15Suppl 3:12–5.
6. Malhotra-Kumar S, Lammens C, Coenen S, Van Herck K, Goossens H. Effect of azithromycin and clarithromycin therapy on pharyngeal carriage of macrolide-resistant streptococci in healthy volunteers: a randomised, double-blind, placebo-controlled study. Lancet. 2007; 369(9560):482–90.
7. Chen DK, McGeer A, de Azavedo JC, Low DE. Decreased susceptibility of Streptococcus pneumoniae to fluoroquinolones in Canada. Canadian Bacterial Surveillance Network. N Engl J Med. 1999; 341(4):233–9.
8. Hopkins S. Improving antimicrobial stewardship and surveillance: the Chennai Declaration. BMJ. 2013; 346:f591.
9. Society for Healthcare Epidemiology of America (SHEA), the Infectious Diseases Society of America (IDSA), and the Pediatric Infectious Diseases Society (PIDS). Infect Control HospEpidemiol. 2012;33(4):322–27.
10. Morris A M. Antimicrobial Stewardship Programs: Appropriate Measures and Metrics to Study their Impact. Current Treatment Options in Infectious Diseases (2014) 6:101-112
11. McGowan Jr JE, Gerding DN. Does antibiotic restriction prevent resistance? New Horiz. 1996; 4(3):370–6.
12. Dellit TH, Owens RC, McGowan Jr JE, *et al*. Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America guidelines for developing an institutional program to enhance antimicrobial stewardship. Clin Infect Dis. 2007;44(2):159–77
13. Willemsen I, Groenhuijzen A, Bogaers D, Stuurman A, van Keulen P, *et al*. (2007) Appropriateness of antibiotic therapy measured by repeated prevalence surveys. Antimicrob Agents Chemother 51: 864–867

Source of Support: None Declared
Conflict of Interest: None Declared