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Original Article

Antimicrobial use and antimicrobial resistance in nosocomial pathogens at a tertiary care hospital in Pune



Maj Gen Velu Nair, AVSM VSM^{**a,*}, Surg Capt Dinesh Sharma^b,
 Brig A.K. Sahni^c, Col Naveen Grover^d, Gp Capt S. Shankar^e,
 Col S.S. Jaiswal^f, Gp Capt S.S. Dalal^g, D.R. Basannar^h,
 Maj Vivek S. Phutaneⁱ, Brig Atul Kotwal, SM^j, G. Gopal Rao, OBE^k,
 Lt Col Deepak Batura, (Retd)^l, Maj Gen M.D. Venkatesh, VSM^m,
 Surg Vice Adm Tapan Sinha, SMⁿ,
 Surg Vice Adm Sushil Kumar, AVSM, NM, VSM^o,
 Air Mshl D.P. Joshi, PVSM, AVSM, PHS, (Retd)^p

^a Senior Consultant (Medicine), O/O DGAFMS, Ministry of Defence, M Block, New Delhi 110001, India

^b Professor, Department of Community Medicine, Armed Forces Medical College, Pune 411040, India

^c Commandant, 174 Military Hospital, C/O 56 APO, India

^d Associate Professor, Department of Microbiology, Armed Forces Medical College, Pune 411040, India

^e Senior Advisor (Medicine), Command Hospital (Air Force), Bengaluru, India

^f Associate Professor, Department of Surgery, Armed Forces Medical College, Pune 411040, India

^g Associate Professor, Department of Paediatrics, Armed Forces Medical College, Pune 411040, India

^h Scientist 'F', Department of Community Medicine, Armed Forces Medical College, Pune 411040, India

ⁱ Resident, Department of Community Medicine, Armed Forces Medical College, Pune 411040, India

^j Commandant, 153 General Hospital, C/O 56 APO, India

^k Honorary Senior Lecturer, Imperial College, London, UK

^l Consultant, London North West Healthcare NHS Trust, London, UK

^m Dean & Deputy Commandant, Armed Forces Medical College, Pune 411040, India

ⁿ DGMS (Navy), IHQ MoD (Navy), New Delhi 110001, India

^o Director and Commandant, Armed Forces Medical College, Pune 411040, India

^p Ex-DGAFMS, O/o DGAFMS, New Delhi 110001, India

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ABSTRACT

Background: Resistance to antimicrobial agents is emerging in wide variety of nosocomial and community acquired pathogens. Widespread and often inappropriate use of broad spectrum antimicrobial agents is recognized as a significant contributing factor to the development and spread of bacterial resistance. This study was conducted to gain insight

* Corresponding author.

E-mail address: nairvelu2000@yahoo.com (V. Nair).

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into the prevalent antimicrobial prescribing practices, and antimicrobial resistance pattern in nosocomial pathogens at a tertiary care hospital in Pune, India.

Methods: Series of one day cross sectional point prevalence surveys were carried out on four days between March and August 2014. All eligible in patients were included in the study. A structured data entry form was used to collect the data for each patient. Relevant samples were collected for microbiological examination from all the clinically identified hospital acquired infection cases.

Results: 41.73% of the eligible patients (95% CI: 39.52–43.97) had been prescribed at least one antimicrobial during their stay in the hospital. Beta-lactams (38%) were the most prescribed antimicrobials, followed by Protein synthesis inhibitors (24%). Majority of the organisms isolated from Hospital acquired infection (HAI cases) were found to be resistant to the commonly used antimicrobials viz: Cefotaxime, Ceftriaxone, Amikacin, Gentamicin and Monobactams.

Conclusion: There is need to have regular antimicrobial susceptibility surveillance and dissemination of this information to the clinicians. In addition, emphasis on the rational use of antimicrobials, antimicrobial rotation and strict adherence to the standard treatment guidelines is very essential.

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Introduction

Antimicrobial resistance (AMR) is a natural biological phenomenon and its emergence is a complex problem driven by many interconnected factors, in particular the use and misuse of antimicrobials. Resistance costs money, livelihoods and lives and threatens to undermine the effectiveness of health delivery programs.¹ Resistance to antimicrobial agents is emerging in a wide variety of nosocomial and community acquired pathogens.² Widespread and often inappropriate use of broad spectrum antimicrobial agents is recognized as a significant contributing factor to the development and spread of bacterial resistance.³ The Indian scenario too, is dismal with regard to antimicrobial prescribing and publications have documented the irrational prescribing patterns in various settings.^{4,5}

Selective antimicrobial pressure is more in a hospital setting. Antimicrobials are prescribed in a community but not as intensively as in a hospital setting.⁶ As antimicrobial use generally precedes the emergence of antimicrobial resistance, preventing the emergence and spread of antimicrobial resistant pathogens clearly requires optimizing antimicrobial use.⁷

Hospitals need to monitor antimicrobial use in an attempt to reduce the emergence and spread of antimicrobial resistant pathogens.⁸ World Health Organization (WHO) highlights the

establishment of effective, epidemiologically sound surveillance of antibiotic use and AMR among common pathogens in the community, hospitals and other health-care facilities as one of the key public health priorities.⁹ Limited literature is available regarding antimicrobial resistance in nosocomial pathogens from our country. The present study was conducted to gain insight into the prevalent antimicrobial prescribing practices; and antimicrobial resistance pattern, in hospital acquired infection organisms, at a tertiary care hospital in Pune, India.

Material and methods

A cross sectional study, comprised of four point prevalence surveys (PPS), was conducted during March–August, 2014 at a

Table 1 – Study population of patients.					
Round	R1	R2	R3	R4	Total
Date	28 Mar 14	06 May 14	27 May 14	08 Jul 14	
Total	501	553	558	507	2119
Eligible	461	491	490	444	1886
HAI	27	24	13	7	71

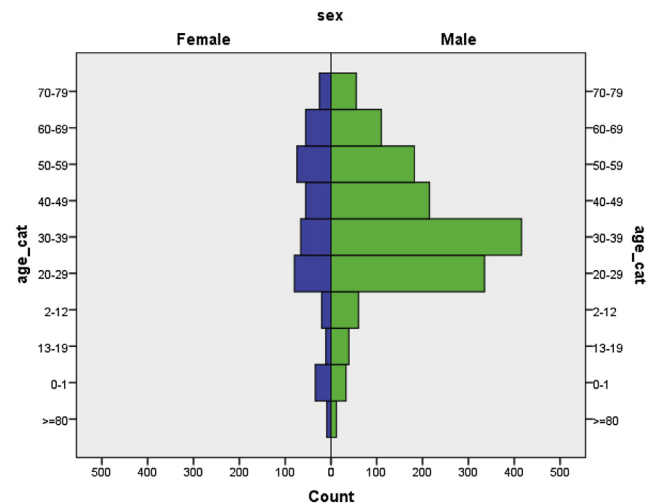


Fig. 1 – Demographics of the survey population.

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