

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/mjafi

Short Communication

Species distribution and antimicrobial resistance pattern of Coagulase-negative Staphylococci at a tertiary care centre

Maj Puneet Bhatt^{a,*}, Capt Kundan Tandel^b, Maj Alina Singh^c,
M. Mugunthan^c, Col Naveen Grover^d, Brig A.K. Sahni^e

^a Graded Specialist (Microbiology), Command Hospital (Southern Command), Pune 411040, India

^b Graded Specialist (Microbiology), DRDE, Gwalior, India

^c Resident, Dept of Microbiology, Armed Forces Medical College, Pune 411040, India

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

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

ARTICLE INFO

Article history:

Received 1 September 2014

Accepted 5 December 2014

Available online 29 March 2015

Keywords:

Coagulase-negative Staphylococci (CoNS)

E-test

Kirby Bauer disc diffusion method

ABSTRACT

Background: Coagulase-negative Staphylococci (CoNS), previously dismissed as contaminants, have now emerged as an important cause of nosocomial infections especially in patients with implants and prosthetic devices. They are a well-known cause of bloodstream infections, urinary tract infections, wound infections, prosthetic valve endocarditis and eye infections. This study was conducted with an aim to identify CoNS at the species level from various clinical samples and determine the antimicrobial resistance pattern of these isolates. **Methods:** This cross sectional study was carried out from September 2011 to February 2014 in which 150 non-repetitive clinical isolates of CoNS were identified at the species level by conventional phenotypic methods. Complete antimicrobial susceptibility profile was also determined by Kirby Bauer disc diffusion method. Susceptibility testing to vancomycin was done by E-test method.

Results: Only three species of CoNS were isolated, the most common being *Staphylococcus epidermidis* (60%) followed by *Staphylococcus saprophyticus* (27.3%) and *Staphylococcus hemolyticus* (12.7%). Most *S. epidermidis* were isolated from blood and intravascular catheter tip samples, whereas all *S. saprophyticus* were isolated from urine samples of female patients. All isolates were found to be resistant to penicillin, but were susceptible to glycopeptides and linezolid and showed variable resistance to fluoroquinolones, aminoglycosides and macrolides.

Conclusion: CoNS are emerging nosocomial pathogens and should not always be overlooked as contaminants. However, growth of CoNS from blood cultures and intravascular catheter tips should be clinically correlated and carefully interpreted. As many CoNS strains exhibit drug resistance, antimicrobial susceptibility profile should be determined prior to treatment of these infections.

© 2015 Published by Elsevier B.V. on behalf of Director General, Armed Forces Medical Services.

* Corresponding author. Tel.: +91 8805205004.

E-mail address: puneetbhatt@gmail.com (P. Bhatt).

<http://dx.doi.org/10.1016/j.mjafi.2014.12.007>

0377-1237/© 2015 Published by Elsevier B.V. on behalf of Director General, Armed Forces Medical Services.

Introduction

Coagulase-negative Staphylococci (CoNS) were previously overlooked as culture contaminants. In the last few decades, they have emerged as important potential pathogens due to the increased use of implants and increase in the number of severely debilitated patients in hospitals. More than 40 species of CoNS are recognized but only a few are commonly isolated from human infections especially in patients with prosthetic devices and implants.¹ CoNS are also a part of the normal skin and mucosal flora and are one of the most important culture contaminants, a fact which makes the interpretation of blood culture results complicated.²

The most frequently encountered CoNS species associated with human infections is *Staphylococcus epidermidis*, which is predominantly associated with intravascular catheters. In addition, *S. epidermidis* is the predominant agent of hospital acquired sepsis, prosthetic valve endocarditis, surgical wounds, central nervous system shunt infections, intravascular catheter related infections, peritoneal dialysis-related infections, and infections of prosthetic joints. The second most frequently encountered CoNS species is *Staphylococcus haemolyticus*. Other CoNS species are also involved in a variety of infections such as, *Staphylococcus saprophyticus*, which is an important pathogen in human urinary tract infections, especially in young, sexually active females, and *Staphylococcus lugdunensis* which has been implicated in arthritis, catheter infections, and prosthetic joint infections.^{1,2}

Because of the increasing clinical significance of CoNS, accurate species identification and determination of the antimicrobial resistance profile is of paramount importance to treat these infections.

This study was carried out with an aim to identify Coagulase-negative Staphylococci at the species level and determine their antimicrobial resistance profile.

Results

Out of 150 isolates of CoNS, the most common species isolated was *S. epidermidis* (90/150) followed by *S. saprophyticus* (41/150) and *Staphylococcus hemolyticus* (19).

The most common clinical samples from which CoNS were isolated were blood (52) followed by intravascular catheter tip (43), urine (41) and pus (14) (Table 1).

The age of the patients from whom CoNS were obtained ranged from 3 months to 77 years of age. It was noticed that

amongst the 150 isolates, 99 were from male patients and 51 were from female patients. Male to female ratio was approximately 2:1. Maximum numbers of isolates were from age group 21-30 years comprising 42.7% of the total followed by 26.7% from age group 31-40 years.

The samples from which CoNS were isolated were collected from various wards including ICU, acute wards, other wards and OPD. Out of 150 isolates, 73 were from ICU (48.7%), 18 were from acute wards (12%), 09 were from other wards (6%) and 50 isolates were from OPD (33.3%) samples.

Antimicrobial susceptibility testing of all the CoNS isolates was done by Kirby Bauer disc diffusion method. Susceptibility to vancomycin was determined by E-test method. Antibiogram of the isolates is shown in Fig. 1. All the isolates were found to be resistant to penicillin. In contrast, all the isolates were found to be sensitive to vancomycin, teicoplanin and linezolid. The resistance to gentamicin, amikacin, erythromycin, ciprofloxacin and levofloxacin was 30%, 27%, 54%, 53%, and 49% respectively.

Cefoxitin disc (30 µg) is used as a surrogate marker for prediction of *mecA* gene mediated resistance to oxacillin and is the preferred method of testing of methicillin resistant CoNS. Out of 150 CoNS isolates, 51 (34%) were found to be resistant to cefoxitin.

Discussion

In the last few decades, Coagulase-negative Staphylococci (CoNS), have emerged as important potential pathogens due to the increase in number of severely debilitated patients and increased use of implants in hospitals.^{1,3} CoNS have been identified as the etiological agent in various infections and are currently the microorganisms most frequently isolated in hospital acquired infections.³ *S. epidermidis* is both a human skin commensal and an opportunistic pathogen, causing infections in patients with implanted medical devices. Immunocompromised patients are predominantly at risk of CoNS infections, as are individuals with indwelling catheters or prosthetic devices. Because many isolates are resistant to multiple antibiotics, their infections are very serious and can even be fatal.⁴

Over 40 species of CoNS are recognized, but only 16 of these species have been isolated from human infections. In the present study, *S. epidermidis* (60%) was the most common species isolated followed by *S. saprophyticus* (27.3%) and *S. hemolyticus* (12.7%). Similar findings were also obtained in a study by Sheikh et al.⁵

Table 1 – Sample wise distribution of CoNS isolates.

Sample	Number			Total	% age
	<i>S. epidermidis</i>	<i>S. saprophyticus</i>	<i>S. hemolyticus</i>		
Blood	42	–	10	52	34.7
Catheter tip	40	–	03	43	28.7
Urine	–	41	–	41	27.3
Pus	08	–	06	14	9.3
Total	90	41	19	150	100

Download English Version:

<https://daneshyari.com/en/article/3160886>

Download Persian Version:

<https://daneshyari.com/article/3160886>

[Daneshyari.com](https://daneshyari.com)