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IP International Journal of Medical Microbiology and Tropical Diseases

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Original Research Article

The speciation and antimicrobial susceptibility pattern of coagulase negative Staphylococci in a tertiary care hospital in Mumbai

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ARTICLE INFO

Article history:
Received 09-12-2020
Accepted 16-12-2020
Available online 02-01-2021

Keywords:
CoNS
Ssaprophyticus
Shaemolyticus
tube coagulase

ABSTRACT

Introduction: This study was carried out in a tertiary care hospital in Mumbai. Coagulase negative staphylococci (CoNS) which were earlier regarded as commensals have emerged as pathogenic. They have emerged as an important cause of nosocomial infections.
Materials and Methods: 56 clinical isolates of CoNS were considered in the study. They were identified using tube coagulase and slide coagulase methods.
Observation: S. saprophyticus was the commonest species of CoNS isolated followed by S. haemolyticus. Other commonly isolated stains were S.lugdunensis and S.epidermidis. CoNS were isolated from different clinical specimens like urine, pus, blood, HVS, catheter tips, tracheal secretions and CSF.
Discussion: Antibiotic susceptibility of urinary as well as non-urinary isolates was tested. All strains were found to be sensitive to Linizolid. 57% were MRCoNs.

1. Introduction

Coagulase negative Staphylococci (CoNS) are regarded as commensals & often ignored in clinical samples. During the last 2 decades Staphylococcus epidermis and the other CoNS have emerged as a major cause of nosocomial infections. Increasing reports of CoNS causing nosocomial infections associated with indwelling devices as their usage has increased in recent times (P. Sharma et all,2019)[1] Increasing antibiotic resistance reported esp. with S.epidermidis, so further characterization of CoNS important

Blood stream infections are a major cause of morbidity and mortality. CoNS are the third most common cause of blood stream infections. As there is an increase in pathogenic significance of CoNS it's important to learn about the epidemiology and pathogenic potential of individual species (Usha MG et al, 2013).[2]

Recovery of the organisms from the specimens should be correlated to the clinical condition of the patient and with their role to cause infections. Risk factors should include patients with intravascular catheters, other foreign bodies in place, prosthetic devices and post-operative wound infections. These organisms usually infect immunocompromised hosts (C.Roopa et al, 2015).[3]

Another concern is the rise of MR-CONS in hospitalised patients. These organisms are difficult to treat because of the risk factors and the multidrug nature of these organism (SY Asangi et al, 2011).[4] This study was carried out to carry out the speciation of CoNS and to determine its antibiotic resistance pattern.

Table 1: Sample wise distribution of CoNS

Samples	No	%
Urine	19	33.9
Pus	12	21.4
Blood	11	19.6
Catheter tips	05	8.9
Tracheal secretions	03	5.4
High vaginal swabs	03	5.4
CSF	01	1.8

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https://doi.org/10.18231/j.ijmmtd.2020.051

Table 2: Speciation of CoNS

CoNS Species	Number	Percentage (%)
S. saprophyticus	15	26.8
S. haemolyticus	14	25
S. lugdunensis	07	12.5
S. epidermidis	06	10.7
S. simulans	04	7.1
S. scuiri	04	7.1
S. xylosus	02	3.6
S. schleiferi	02	3.6
S. cohnii	01	1.8
S. hominis	01	1.8

Table 3: Speciation of CoNS in different clinical isolates

Species	Urine	Blood	PUS	Catheter TIP	TRS	HVS	CSF
S. haemolyticus	2	2	7	1	1		1
S. saprophyticus	8	3	1	1	1	1	
S. lugdunensis	2	3	1			1	
S. epidermidis	1	3	1	1			
S. simulans	2		1	1			
S. scuiri	2		2				
S. xylosus	1			1			
S. schleiferi			1		1		
S. hominis						1	
S. cohnii	1						

Table 4: Resistance pattern of CoNS in urinary isolates

Isolate	Amp	TMP	Nalidixic acid	Levo-floxacin	Line zolid
S.saprophyticus (8)	4	8	4	8	0
S.haemolyticus (2)	2	2	0	2	0
S.epidermidis (1)	1	1	0	1	0
S.lugdunensis (2)	2	2	1	2	0
Other CoNS (6)	4	6	6	4	0

Table 5: Resistance pattern of CoNS

Isolate	Oxacillin	Erythromycin	TMP	Gentamycin	Cipro	Linezolid
S.saprophyticus (5)	5	3	5	4	2	0
S.haemolyticus (12)	9	10	12	3	9	0
S.lugdunensis (6)	5	5	6	2	1	0
S.epidermidis (4)	4	3	4	1	3	0
Other (10)	8	8	10	8	7	0

2. Material and Methods

This study was carried out in the department of microbiology, Grant Government Medical college and Sir JJ Group of hospitals, Mumbai. It was carried out for a period of 6 months from January 2007 to June 2007. 56 clinically significant isolates were considered in the study from different clinical samples. The different clinical samples were sputum, blood, pus, urine samples etc. The isolates were considered clinically significant when isolated in pure culture. Conventional test that were easy to perform and inexpensive were chosen. Speciation was done based on various morphological tests. The test was chosen from the scheme of Kloos and Schleifer and Koneman. The isolates were processed by colony morphology, gram staining, catalase, slide and tube coagulase, and acid formation from mannitol. Also, novobiocin resistance was tested along with urease activity and acid production from

mannitol, mannose, sucrose, lactose, maltose and xylose (Winn et al, 2006).[5] Also nitrate reduction was tested. The antibiotic sensitivity was performed using Mueller-Hilton agar by the Kirby-Bauer's disc diffusion method . Antibiotic sensitivity was tested according to CLSI guidelines. Antibiotic sensitivity in urinary isolates was tested to Ampicillin, Levofloxacin, Trimethoprim, Nalidixic acid and Linezolid. Antibiotic sensitivity in non-urinary isolates was tested to Oxacillin, Gentamycin, Trimethoprim, Erythromycin, Ciprofloxacin and Linezolid.

3. Observation

Among the 56 isolates of CoNS S.saprophyticus (26.8%) was commonest. This was followed by S.haemolyticus (25%), S.lugdunensis (12.5%), S.epidermidis (10.7%), S.simulans (7.1%), S.scuiri (7.1%), S.zylosus (3.6%), S.scheiferi (3.6%), S.cohnii (1.8%), S.hominis (1.8%).

Among the 56 CoNS 33.9% were urinary isolates. 21.4% were isolated from pus, 19.6% from blood, 8.9% from catheter tips, 5.4% from tracheal secretions and 5.4% from high vaginal swabs. 1.8% CoNS were isolated from CSF.

4. Discussion

In the current study 56 pathogenic CoNS isolates were obtained over a six month period. They were 1.6% CoNS were among the total clinical isolates obtained during that period of six months.

Isolates were commonly obtained from Urine (33.93%), blood (19.64%) & pus (21.43%).

Ten different species were isolated among the CoNS.

Saprophyticus (36 84% was the most common CoNS isolated from the urine,

S. haemolyticus was the common CoNS isolated from pus. S.epidermidis and S. lugdunensis were the common CoNS isolated from blood.

All isolates were resistant to Trimethoprim while 57% were MRCoNS resistant to oxacilln.

All species of CoNS were sensitive to Linezolid.

Among the urinary isolates the was 100% resistance to Trimethoprim and Levofloxacin.

5. Source of Funding

None.

6. Conflict of Interest

No conflict of Interest is reported

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Cite this article: Kulkarni M, Patil S. The speciation and antimicrobial susceptibility pattern of coagulase negative Staphylococci in a tertiary care hospital in Mumbai. *IP Int J Med Microbiol Trop Dis* 2020;6(4):227-229.