



PREVALENCE AND ANTIBIOGRAM OF NONFERMENTING GRAM NEGATIVE BACILLI FROM PAEDIATRIC BLOOD CULTURES

Medical Microbiology

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ABSTRACT

INTRODUCTION: Sepsis is responsible for a substantial proportion of global childhood morbidity and mortality. Nonfermenting Gram-negative bacilli (NFGNB) have emerged as a major cause of healthcare-associated infections and are innately resistant to many antibiotics. **AIM & OBJECTIVES:** This study was conducted to identify the prevalence of Nonfermenting Gram-negative bacilli and their antibiotic sensitivity pattern in pediatric blood cultures. **MATERIALS AND METHODS:** This prospective study was done in a paediatric hospital for a period of nine months. Identification and antimicrobial susceptibility testing of NFGNB from suspected paediatric sepsis patient was done using automated methods like BacT/Alert and VITEK 2 system. **RESULTS:** In the present study, out of 594 paediatric Blood samples processed, 34 samples were found to be culture positives. 20% were identified as Nonfermenting gram negative bacilli. Different Non fermenting gram negative bacilli isolated were Burkholderia gladioli, Stenotrophomonas maltophilia, Achromobacter xylosoxidans and Sphingomonas paucimobilis. Among NFGNB positive patients minimum age was 5 days of life and maximum age was 7 years. Burkholderia gladioli, Achromobacter xylosoxidans and Sphingomonas paucimobilis were susceptible to Imipenem. Burkholderia gladioli and Sphingomonas paucimobilis were susceptible to Piperacillin/Tazobactam whereas Stenotrophomonas maltophilia and Achromobacter xylosoxidans were susceptible to Levofloxacin, Minocycline and Trimethoprim/Sulfamethoxazole. **CONCLUSION:** Problems arise in laboratory when rare or atypical strains or newly described species are isolated and need to be identified, such situation lead to the result of misidentified or unidentified strains. For this reason, a number of automated commercial systems have been evaluated for routine laboratory use. VITEK 2 technology and VITEK 2 ID cards provide reliable and accurate results of clinically important bacteria.

KEYWORDS

NFGNB -Nonfermenting Gram negative bacilli, ID cards-Identification cards, VITEK 2 system.

INTRODUCTION

Neonatal sepsis refers to systemic infection of the newborn is characterized by nonspecific symptoms and documented positive blood culture. An estimate of 7.5 million deaths annually occurs in the pediatric population due to sepsis worldwide (1,2). Blood culture-positive sepsis results in mortality in 33%-35% of affected neonates (3). Gram negative bacilli which are non-fermenters (NFGNB) are a heterogeneous category of microorganisms which do not have the ability to ferment sugars. NFGNB, which were considered as contaminants in the past, have emerged as important major pathogenic organisms responsible for causing a variety of infections in recent years (4). Bloodstream infections due to non-fermenting Gram-negative bacilli other than Pseudomonas aeruginosa (NF-GNB) are uncommon in children but their incidence is reported to be increasing (5). Literature about clinical outcomes of infections with individual NFGNB is available, but publications about the profile of all NFGNB that cause sepsis and its outcome are limited.

MATERIAL & METHODS

This prospective study was carried out at Sri Krishna Children's Hospital, Warangal from January 2022 to September 2022. A total of 594 Blood samples were included in the study. Following aseptic precautions, Blood samples were collected from sepsis suspected pediatric patients and inoculated into the aerobic blood culture bottle and incubated in BacT/Alert, an automated continuous-monitoring blood culture system. All the blood cultures flagged positive by BacT/Alert system were included in the study. Positive signal flagged bottles were used for identification and susceptibility testing using the VITEK 2 system. All blood cultures with anaerobic bacteria or polymicrobial growth were excluded from the study.

RESULTS

A total of 594 Blood samples were included in the study. 34 blood samples were found culture positive. 20(58.8%) were identified as Gram negative Bacteria, 4(20%) were identified as Non fermenting gram negative bacilli. Among NFGNB 2 patients were Males and 2 were females with minimum age of 5 days of life and maximum age was 7 years affected.

Table 1: NONFERMENTING GRAM NEGATIVE BACILLI ISOLATED FROM SEPSIS SUSPECTED PEDIATRIC PATIENTS

	NFGNB	NUMBER N=4	AGE	SEX
1	Burkholderia gladioli	01	5 Days	Male

2	Stenotrophomonas Maltophilia	01	4 Years	Female
3	Achromobacter xylosoxidans	01	7 Years	Male
4	Sphingomonas paucimobilis	01	24 Days	Female

Table 2: ANTIMICROBIAL SUSCEPTIBILITY PATTERNS OF NONFERMENTING GRAM NEGATIVE BACILLI

	ANTIBIOTIC	NON-FERMENTERS
1	Susceptible to Imipenem, Cefazolin, Gentamycin, Piperacillin/tazobactam, Amikacin	Burkholderia gladioli
2	Susceptible to Levofloxacin, Minocycline, Trimethoprim/Sulfamethoxazole	Stenotrophomonas maltophilia
3	Susceptible to Ceftazidime, Cefoperazone/sulbactam, Imipenem, Meropenem, Levofloxacin, Minocycline, Trimethoprim/Sulfamethoxazole, Amoxicillin/clavulanic acid	Achromobacter xylosoxidans
4	Susceptible to Imipenem, Ceftriaxone, Ciprofloxacin, Piperacillin/Tazobactam,	Sphingomonas paucimobilis

Burkholderia gladioli, Achromobacter xylosoxidans and Sphingomonas paucimobilis were susceptible to Imipenem. Burkholderia gladioli and Sphingomonas paucimobilis were susceptible to Piperacillin/Tazobactam whereas Stenotrophomonas maltophilia and Achromobacter xylosoxidans were susceptible to Levofloxacin, Minocycline and Trimethoprim/Sulfamethoxazole.

DISCUSSION

NFGNB are widely distributed in nature as saprophytes, found in soil, water, sewage or as commensals on human skin or in the human gut and some of them found in hospital environment⁽⁶⁾. They are intrinsically resistant to various antimicrobials and are known to produce extended spectrum betalactamases (ESBL's) and metallobetalactamases⁽⁷⁾(MBL's).

In our study, 20% paediatric sepsis cases were caused by NFGNB. Burkholderia gladioli, Stenotrophomonas maltophilia, Achromobacter xylosoxidans and Sphingomonas paucimobilis were the nonfermenting Gram negative bacilli isolated. Similar to study done by Santhosh K Panda⁽⁵⁾, 29% were NFGNB species isolated in

neonatal cases of blood culture-positive sepsis. *A. baumannii* and *B. cepacia* were NFGNB commonly isolated.

Rajlakshmi Viswanathan et al ⁽⁴⁾ reported that 32.1% were NFGNB from neonatal sepsis cases. *Acinetobacter* spp was the most common organism. In contrast to study done by S Ladhani et al ⁽⁸⁾, 12 (0.1%) paediatric sepsis cases were due to NFGNB, *Stenotrophomonas maltophilia* (67%) was the most frequently isolated NF-GNB.

CONCLUSION

In our study, 20% of paediatric culture positive were identified as Nonfermenting gram negative bacilli. *Burkholderia gladioli*, *Stenotrophomonas maltophilia*, *Achromobacter xylosoxidans* and *Sphingomonas paucimobilis* were NFGNB isolated and *Burkholderia gladioli*, *Achromobacter xylosoxidans* and *Sphingomonas paucimobilis* were susceptible to Imipenem.

CONFLICT OF INTEREST

The author have declared that no competing interests exist.

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