State of the Globe: Non-Fermenting Gram-Negative Bacilli Challenges and Potential Solutions

The non-fermenting Gram-negative bacilli (NFGNB) are a diverse group of at least 15 families. The NFGNB (other than *Pseudomonas* and *Acinetobacter*) provokes the microbiologist with a unique amalgam of challenges-ubiquity, intrinsic resistance, hardiness and predominantly affecting immunocompromised patients. Many of the members of this group are associated with chronic lung conditions, cystic fibrosis in particular. There are numerous complexities in the identification of these non-fermenters, but diagnostic accuracy has been enhanced with the advent of automated identification systems (such as the VITEK 2 system). Emerging methods, which are not based on traditional phenotypic methods, such as matrix-assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF MS) are being validated before clinical application.[1]

The point at issue being: Can such a perplexing group of bacteria – highly resistant and ubiquitous -be effectively managed? It is my pleasure to present to you a thought provoking article "NFGNB other than *Pseudomonas aeruginosa* and *Acinetobacter* spp. causing respiratory tract infections in a tertiary care center," a retrospective study yielding 33 samples of NFGNB (other than *Pseudomonas* and *Acinetobacter*). The authors have deliberately excluded samples of *Pseudomonas* and *Acinetobacter* spp., which often have larger representation among samples and thus overshadow other members of this group.

This article draws out some of the important issues in management of NFGNB.

Precise identification: The importance of accurate identification cannot be underscored as these species are only infrequently encountered. Due to this many lab personnel may not be familiar with methods for identification. The slow growth of these fastidious strains and low diagnostic accuracy of packaged commercial kits may further hinder correct identification. By using automated identification systems, these hindrances may be overcome. Newer methods for identification such as MALDI-TOF MS are reported to be cost-effective, time efficient and have high reproducibility.[2] The present study used VITEK 2 system for identification.

Clinico-microbiological correlation and prevention of cross infection: This step is critical in the successful management. Clinicians and Microbiologists should be well-versed with the varied clinical expression of these organisms. Identification of pathogenic strains assists in appropriate prescription of antibiotics. Preventive strategies such as contact precautions, sterilization of respiratory devices and adherence to hand hygiene guideline should be made mandatory whenever appropriate. Nearly 24.24% of the strains in the present study were hospital acquired. To reduce this burden the implementation of hospital infection control policy should be stressed. Degree of prevention should be adapted for each case, isolation of *Burkholderia cepacia* complex, which has high potential for patient-to-patient transfer will require strict cross infection control. *Achromobacter xylosoxidans* on the other hand may not require such rigorous infection control based on the poor potential for cross-contamination it has demonstrated.[3]

Multi drug resistance in NFGNB: The sensitivity pattern of NFGNB is complex. Pre-existing inherent resistance and poor antibiotic stewardship, leading to acquired resistance, leaves the clinician with very few antibiotic alternatives to choose from. But early identification along with appropriate prescription based on sensitivity can lead to rewarding results as mentioned here. A cure rate of 87.9% has been reported in the present study, which is very heartening in comparison with earlier results.[4,5] Care should be taken while carrying out sensitivity testing of *Stenotrophomonas maltophilia* as non-standard culture methods (incubation at 30°C) are required and false susceptibility readings have been reported with disc diffusion assays and the E-test. Some automated systems such as VITEK Legacy have inbuilt programming that prevents reporting of susceptibility results if *S. maltophilia* is identified as the test organism. The preferred method is agar dilution and microdilution.[6] Sensitivity against known first line antibiotics should be carried out so that trends in antibiotic resistance can be better understood. The present

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study has not tested the sensitivity of *S. maltophilia* to ticarcillin-clavulanic acid, which is generally recommended for initial therapy. A sensitivity of 86.7% has been reported against trimethoprim and sulfamethoxazole (STX), *S. maltophilia* continues to be persistently sensitive to STX and a good cure rate has been reported.[7]

In conclusion, NFGNB are a group of emerging nosocomial pathogens. Growth of such organisms cannot be overlooked and should be confronted with high index of suspicion. Precise identification, imperative clinico-microbiological correlation, preventive strategies and careful antibiotic prescription will go a long way in improving clinical outcomes.

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