

EDITORIAL

Alarming Pandrug Resistance (PDR), Extensive Drug Resistance (XDR), and Multidrug Resistance (MDR) Gram-Negative Bacilli

Moazzem HOSSAIN

Professor, Department of Microbiology & Principal, Monno Medical College, Manikgonj, Bangladesh; Email: profdrmoazzemhossain@gmail.com; Cell no.: +8801715038551

Antibiotic resistance is alarming worldwide. Many novel antibiotics are now resistant to many gram negative bacilli. Irrational use of antibiotic is the main reason of it. Among these resistant bacteria, Paterson and Doi¹ mentioned the necessity of accepted definitions for the various grades of antimicrobial resistance among gram-negative bacilli. Polymyxins are a “rediscovered” category of antimicrobial agents² and tigecycline is also a new drug³. These two drugs are very important to the clinicians which are very much effective against highly resistant gram-negative bacteria.

It has been proposed the term “extreme drug resistance” (XDR) to signify resistance of pathogens that are gram negative to all potentially effective antibiotics⁴. The meaning of the already-used term “pan-resistance” is to refer to the pathogens that are specifically resistant to 7 antimicrobial agents named as cefepime, ceftazidime, imipenem, meropenem, piperacillin-tazobactam, ciprofloxacin, and levofloxacin⁴. The prefix “pan-” has its origin in the ancient Greek language, meaning “all” or “whole.” In this respect, the term “pan-resistance” or “pan-drug resistance” (PDR) cannot be interpreted in a sense other than signifying resistance to all antibiotics⁵. In this regard to the term “extreme drug resistance,” it was first used in the field of onco-hematology to designate tumor cell colonies that exhibit significantly decreased responsiveness in vitro to a studied chemotherapeutic agent. In the field of infectious diseases, “XDR” has been used to abbreviate “extensively drug resistant” *Mycobacterium tuberculosis* which is defined by resistance to both rifampin and isoniazid, as well as to fluoroquinolones plus an injectable agent⁴. Presumably, Paterson and Doi¹ introduced the term “extreme drug resistance” for gram-negative bacteria to designate a wider resistance pattern than “extensive drug resistance.” In fact, apart from the term pan drug resistance, notable diversity has been observed as well in the medical literature regarding the use of the term “multidrug

resistance” (MDR), which has rather arbitrarily been used to denote resistance of gram-negative pathogens to a varying number of antimicrobial agents⁶.

When all these issues are considered, the terms “pan-drug resistance,” “extensive drug resistance,” and “multidrug resistance” should designate, respectively, resistance of a pathogen to all, resistance to all but 1 or 2, and resistance to 3 classes of antimicrobial agents⁷.

“Extensive drug resistance” is a better term than “extreme drug resistance” which will mitigate the confusion with the different meaning of the latter term in the context of neoplastic diseases⁴. In addition to that, the definitions of PDR and extensive drug resistance will retain their semantic properties in time⁸, without the need of introduction of new terms in cases in which more therapeutic options against highly resistant bacteria become available.

Cited as: Hossain M. Alarming Pandrug Resistance (PDR), Extensive Drug Resistance (XDR), and Multidrug Resistance (MDR) Gram-Negative Bacilli. *J Curr Adv Med Res*, 2015;2(1):1-2]

References

1. Paterson DL. Epidemiological Profile of Infections with Multidrug-Resistant *Pseudomonas aeruginosa* and *Acinetobacter* Species. *Clin Infect Dis* 2006;43(Suppl 2):43-8
2. Falagas ME, Bliziotis IA, Kasiakou SK, Samonis G, Athanassopoulou P, Michalopoulos A. Outcome of Infections Due To Pan Drug Resistant (PDR) Gram-Negative Bacteria. *BMC Infect Dis* 2005;5:24
3. Hoban DJ, Bouchillon SK, Dowzicky MJ. Antimicrobial Susceptibility Of Extended Spectrum β -Lactamase Producers And Multidrug Resistant *Acinetobacter Baumannii* Throughout The United States And Comparative In Vitro Activity Of Tigecycline, A New Glycylcycline Antimicrobial. *Diagn Microbiol Infect Dis* 2007;57:423-8
4. Falagas ME, Karageorgopoulos DE. Pandrug Resistance (PDR), Extensive Drug Resistance (XDR) and Multidrug

- Resistance (MDR) among Gram-Negative Bacilli: Need for International Harmonization in Terminology. *Clin Infect Dis* 2008;46:1121–2
5. Falagas ME, Kasiakou SK. Correct Use Of The Term “Pan-Drug-Resistant” (PDR) Gram-Negative Bacteria. *Clin Microbiol Infect* 2005;11:1049–50
 6. Paterson DL, Doi Y. A step closer to extreme drug resistance (XDR) in gram-negative bacilli. *Clin Infect Dis* 2007;45:1179–81
 7. Falagas ME, Koletsi PK, Bliziotis IA. The diversity of definitions of multidrug-resistant (MDR) and pandrug-resistant (PDR) *Acinetobacter baumannii* and *Pseudomonas aeruginosa*. *J Med Microbiol* 2006;55:1619–29
 8. Falagas ME, Kasiakou SK. Colistin: The Revival of Polymyxins for the Management of Multidrug-Resistant Gram-Negative Bacterial Infections. *Clin Infect Dis* 2005;40:1333–41