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Active surveillance of emerging bacteria, yeasts and algae: experience from an indian tertiary care centre

Inam Danish Khan
WB Health Sciences University, India

Background: Emerging organisms are organisms that have newly appeared in a cohort/population or have existed but are rapidly increasing in incidence, geographic or host range. While, one-tenth of all infectious diseases are attributable to emerging organisms, operationally defining an organism as emerging is a subjective endeavour. Emerging organisms garner active surveillance as availability of limited data and doubtful pathogenicity restricts conclusive studies. This study intends to characterize emerging bacteria, yeasts and algae at an Indian tertiary care teaching hospital.

Methods: 33836 positive isolates obtained from 132646 processed samples during 2011-14 were included. Identification percentage >85% along with inbuilt standards for identification comparison were considered for final validation through automated systems. Non repeat positive cultures were interpreted in conjunction with colony characteristics, cellular morphology, disc-diffusion/E-test susceptibility patterns, clinical correlates and environmental surveillance. The frequency of isolation, sources, referring centres, susceptibility profiles and phenotypic characteristics were noted. Human pathogenicity and prevalence of emerging bacteria, yeasts and algae were correlated with existing literature to define them as emerging.

Results: 13498 (79.78%) Gram negative, 3254 (19.23%) Gram positive bacteria, 332 yeasts/algae (0.98%) were isolated from 33836 isolates. A total of 1190 (3.51%) emerging bacteria and 174 (0.51%) emerging yeasts/algae were noted. Emerging enterobacteriaceae comprised of 39 species in 18 genera, non-fermenters 41 species in 22 genera, Gram-positive bacteria 63 species in 15 genera, yeasts 14 species in 4 genera and one species of Prototheca, which is a pathogenic algae. These emerging organisms were isolated from multiple sources from various patients and centres. Most of the isolates were multi-resistant while only a few were susceptible to commonly used drugs. Surveillance from air, water, surfaces, disinfectant solutions and healthcare staff was not corroborative.

Conclusion: Emerging bacteria have the potential to opportunistically infect compromised hosts. Challenges at diagnosis, treatment and surveillance exist due to improper identification, questionable pathogenicity, antimicrobial resistance, inadequate surveillance mechanisms and neglected cases. Astute efforts directed at identification of emerging isolates, decisions by clinical microbiologists and treating physicians; active surveillance and containment of infection are required.

Key words: Emerging organisms, Microbial identification, Antimicrobial resistance, Automated microbiology systems, Protothecosis

Notes:

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