RESEARCH LETTER

Multidrug Resistant Enterococci in a Rural Tertiary Care Hospital- A Cause of Concern

Loveena Oberoi, Aruna Aggarwal

Enterococci are a leading cause of nosocomial infections. The increasing occurrence of enteroccoci in past two decades is attributable to their resistance to commonly used antimicrobial agents & their potential for acquiring & disseminating resistant genes with an ease (1).Enterococci with high level resistance to aminoglycosides (HLAR), Beta-lactamase production and glycopeptide resistance including Vancomycin resistance are posing a therapeutic challenge not only for clinicians but also for healthcare institutions. Risk factors like indiscriminate use of antibiotics,prolonged hospital stay,severity of illness & immunosuppression are responsible for nosocomial acquisition of drug resistant enterococci ultimately leading to environmental contamination & cross infections (2,3).

A study was undertaken to know the prevalence of enterococci and to detect high level aminoglycoside resistance & vancomycin resistance in SGRD Institute of Medical Sciences and Research, Vallah, Sri Amritsar. A total of 76 enterococcal isolates 58 (76.31%) from urine, 20 (26.31%) from pus & wound swabs, 6 (7.89%) from blood and 2 (2.63%) from other body fluids of the hospitalized patients from Jan 2009 to Dec 2009 were included in the study. Isolates were identified & speciated by standard biochemical tests (4).

Antibiotic susceptibility to ampicillin, piperacillin, azithromycin, ciprofloxacin, chloramphenicol, rifiampicin & linezolid was tested by Kirby Bauer disc diffusion method (KBDDM) as recommended by CLSI (5). High level aminoglycoside resistance was detected by using high content discs of gentamicin (120ug) and streptomycin (300 ug), Himedia. HLAR was also determined by Agar screening method using concentration of >2000 ugm/ml for streptomycin and 500 ugm/ml for gentamicin as break points (1).

Susceptibility to vancomycin was performed by Kirby Bauer disc diffusion method using 30 ug disc of vancomycin (Himedia) and Vancomycin agar screen method using 6ugm/ml of vancomycin incorporated in Brain heart infusion agar. Minimum Inhibitory concentration (MIC) of all isolates was determined by macrobroth dilution method, using dilution of vancomycin ranging from 2 ug/ml to 512 ug/ml. Susceptibility to teicoplanin was done by disc diffusion method in isolates showing MIC of vancomycin more than 4 ug/ml (5).

Out of 76 enterococcal strains 51(67.10%) were identified as E. faecalis, 21 (27.63%) E.faecium, 2 (2.63%) E.gallinarum & 2 (2.63%) E. durans. Higher frequency of E. faecalis might be due to its greater intrinsic virulence.Our isolation rate was close to studies done by Rahangdele *et al* (6). However a study reported by De et al showed higher prevalence of E. faecium (55%) than E. faecalis (31%) (7). High frequency of E. faecium in urban hospitals could be because of chronicity of the cases & wider use of broad spectrum antibiotics.

A total of 32 (42.10%) isolates exhibited high level resistance to gentamicin (HLGR) & 29 (38.15%) to HLSR. There was complete correlation between two methods ie. High content disc diffusion method & Agar screening method. HLGR among E.faecium isolates (56.16%) was higher than in E.faecalis (29.45%) strains. Similarly HLSR (45.72%) was more in E.faecium than in E.faecalis (28.8%). Similar results were also reported by Mendiratta *et al* (8). Alarmingly high percentage of HLAR could nullify efficacy of combination therapy of beta-lactams & aminoglycosides recommended for the treatment of serious enterococcal infections. Therefore, to distinguish these high level aminoglycoside resistant strains from simply intrinsic resistant strains is of vital importance.

14(18.42%) isolates were resistant to vancomycin by KBDDM, while by vancomycin screen agar, resistance was observed in 16 (21.05%) isolates. Our results were supported by other Indian studies (3) MIC of these VRE isolates was between 8 ug/ml to 32 ug/ml. All isolates were sensitive to teicoplanin, so being of Van B phenotype. Emergence of Vancomycin resistant enterococci in this rural setup is a matter of concern due to limited therapeutic options highlighting the importance of screening for vancomycin resistant enterococci (VRE) isolated from various samples. In the present study, Both E.faecalis & E.faecium showed multidrug resistance to rifampicin

From the Department of Microbiology, Sri Guru Ram Das Institute of Medical Sciences & Research, Amritsar-(Pb.) India
Correspondence to : Dr. Loveena Oberoi, 76, Avtar Avenue, Near Medical Enclave, Amritsar-(PB.) India

(92.86%), ciprofloxacin (74.42%), azithromycin (64.29%) & piperacillin (39.14%). Old antibiotics like chloramphenicol and fosfomycin previously abandoned are regaining clinical relevance in the treatment of infections caused by these multidrug resistant organisms, so are being reintroduced into clinical practice (9). There was good sensitivity for chloramphenicol (79.15%) in our study. High sensitivity to linezolid (90.25%) was observed. E. faecium was found more resistant to these commonly used antienterococcal drugs as compared to E. faecalis which is also reported by Karmarkar *et al* (3).

Enterococcal colonization occurs as a prelude to serious clinical infection, so enterococcal resistant was also determinated in 20 environmental enterococci isolated from various ICUs especially NICU & PICU. Isolated species were E. faecalis 14 (70%) E. faecium 6 (30%). HLGR was 36.25% & HLSR was 27.5%. Vancomycin resistant was detected in 19.75% isolates.

In our study antibiotic resistance of environmental enterococci was in concordance with that of clinical isolates. Enterococcus is a successful environmental contaminant having potential for transfer of drug resistance from environment to patients resulting in spread of resistant strains in the hospital settings (10). Hence surveillance & control of faecal colonization of resistant strains in the hospital staff should be done time to time.

In conclusion multidrug resistant enterococcus especially resistant to vancomycin & aminoglycosides has become a threat to patient's safety, making it a formidable nosocomial pathogen. The steady pandemic spread of such strains along with acquisition of resistance to new antimicrobials warrents continued surveillance by microbiology laboratory of these versatile organisms. Hence prompt recognition of multidrug resistant organisms from clinical specimens by effective detection methods, surveillance for colonization, rationale use of antimicrobials especially limited use of 3rd generation cephalosporins which are responsible for selection pressure of resistant strains is of paramount significance.

Implementation of effective infection control practices including use of gloves and gowns, scrupulous hand washing and correct non adherent practices are important contact precautions to reduce cross contamination by resistant organisms. Thus, multifactorial control efforts can effect a decrease or atleast prevent the spread of such strain in the hospital settings.

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