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Epidemiology and antibiotic susceptibility patterns of the *Morganellaceae* family in urinary tract infections in inpatients and outpatients from 2008–2017: A retrospective and comparative analysis

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Members of the *Morganellaceae* family (namely *Proteus*, *Providencia* and *Morganella*) are peritrichous Gram-negative rods. In addition to strong urease production, they possess virulence factors crucial for the pathogenesis of UTIs (IgA protease, haemolysin, cytotoxins and fimbriae). They are intrinsically resistant to various antibiotics (tetracyclines, nitrofurantoin, colistin) and produce AmpC- β -lactamases, making the management of these infections difficult. Complicated UTIs caused by the species are associated with stone formation, pyelonephritis, recurrence and prolonged treatment. UTIs caused by *Morganellaceae* were identified retrospectively by reviewing the computerized records of the Department of Clinical Microbiology, Albert Szent-Gyorgyi Clinical Centre. The data screening included samples taken at inpatient departments and outpatient clinics over a 10-year period (2008–2017). Statistical analyses were performed using IBM SPSS 24.0. *Morganellaceae* members were more frequently isolated in case of inpatients (7.20 \pm 1.74% vs. 5.00 \pm 0.88% out of 1392 and 1058 positive urine cultures; $p=0.003$). 69.38% of isolates originated from catheter-specimen urine in the inpatient group. *Proteus mirabilis* was most frequently isolated (inpatients: 81.54 \pm 2.76%; outpatients: 82.49 \pm 4.76%) of the group. In 7.28% for inpatients and 8.33% for outpatients, co-infection occurred. The ratio of resistant strains in the inpatient group were significantly higher to co-trimoxazole (62.03 \pm 7.74% vs. 46.32 \pm 11.85%; $p=0.003$), ciprofloxacin (47.58 \pm 10.39% vs. 23.27 \pm 10.62%; $p<0.0001$) and ceftriaxone (36.19 \pm 10, 83% vs. 21.10 \pm 11.10%; $p=0.007$), but not in case of gentamicin (16.31 \pm 4.03% vs. 14.55 \pm 3.67%; $p>0.05$). No meropenem-resistant isolates were recovered. Fosfomycin susceptibility testing was performed in 14.49% of isolates overall, 56.91% was susceptible. The high incidence of strains resistant to ceftriaxone and ciprofloxacin (>40% of isolates) has been consistent since 2010, while for co-trimoxazole (>60% of isolates) since 2011. Isolates originating from outpatient departments showed similar growing trends in the survey period. The knowledge of local resistance patterns should influence antimicrobial therapy. The marked (5.7-times higher) increase in the isolation of *Morganella* and *Providencia* spp. since 2013 should also be noted.

Biography

Mario Gajdacs has completed his Graduation as a Pharmacist and has completed his PhD in Medical Microbiology in the Doctoral School of Interdisciplinary Medicine at the University of Szeged. After spending time in the clinical microbiology laboratory, he enrolled post-doctoral studies and specialized pharmacist-studies in the Institute of Pharmacodynamics and Biopharmacy, where he is currently working as an Assistant Lecturer. He has broad interdisciplinary experience in medical microbiology and the pharmacology/use of antimicrobial drugs. His research interests include the development and screening of novel compounds with antibacterial and anticancer properties, problem perception and development of antibiotic resistance by the public and various healthcare professionals and the driving forces behind the non-prudent use of antimicrobial drugs. He has published 18 papers in reputed journals.

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