Association of qnrB Gene with Ofloxacin Resistance among Uropathogenic Escherichia coli Isolated from Patients with Urinary Tract Iinfection

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Abstract

Background and objective: Urinary tract infection (UTI) is one of the most common bacterial infections and one of the main causes of patients visiting hospitals. The aim of this study was to investigate the relationship between the presence of *qnr*B gene and ofloxacin resistance**.**
Materials and methods: In this study, sampling was performed in 1396 and during the spring from Kermanshah hospitals as a census (all available samples). Clinical samples (urine) suspected of generalized urinary tract infection were collected. The *qnr*B resistance gene was further identified by PCR and finally statistical analysis of the data was performed by SPSS v23.
Results: In this study, 105 *Escherichia coli* isolates were isolated and identified from clinical urine samples. The resistance of strains to the ofloxacin antibiotic was 33.33%. PCR results showed that 67 strains (63.8%) had the *qnr*B gene and 38 strains (36.19%) lacked this gene. The results of statistical analysis showed that there was no significant relationship between the presence of *qnr*B gene and ofloxacin resistance.
Conclusion: The results of this study show that the frequency of *qnr*B gene among *Escherichia coli* isolates isolated from urinary tract infections in Kermanshah has a relatively high rate. The results of the present study can be used by physicians to select appropriate measures for the treatment and prevention of improper administration of antibiotics.

Keywords: Ofloxacin, qnrB, Escherichia coli, urinary tract infection

Frequency of Biofilm Producing Methicillin Resistant Staphylococcus epidermidis Strains Isolated from Patients in Isfahan

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Abstract

Background and objective: Staphylococcus epidermidis is an opportunistic pathogenic bacterium which is able to form biofilm and often associated with nosocomial infections. The aim of this study was to determine the frequency of biofilm formation and antibiotic resistance patterns among methicillin resistant S. epidermidis (MRSE) strains isolated from patients in a referral hospital in Isfahan.
Materials and methods: In this study, during 2015 and 2016, a total of 139 suspected S. epidermidis strains were collected from clinical samples of patients in a referral hospital in Isfahan. All isolates were identified at the species level using standard biochemical tests and PCR. The resistance of strains to cefoxitin was detected using disk diffusion method by the guidelines of CLSI and antibiotic resistance patterns of methicillin resistant strains to 10 antibiotics was also determined. To measure the ability of MRSE strains to form biofilm, qualitative Congo-red agar and quantitative microtiter plate assays were employed.
Results: Using standard biochemical tests and PCR, 107 S. epidermidis strains were identified and confirmed among clinical samples. According to the results of disk diffusion test, 52% of strains were methicillin resistant and the high level resistance to erythromycin was also observed. Moreover, all MRSE strains showed susceptibility to vancomycin, linezolid, quinupristin-dalfopristin and chloramphenicol. The results of Congo-red agar test showed that 41% of strains had black colonies and were slime positive. Also, in microtiter plate assay, 50% of strains produced strong biofilm.
Conclusion: The results of this study indicating the high prevalence of biofilm producing MRSE strains among desired hospital in Isfahan. Such strains which show high antibiotic resistance could be an important challenge for public health.

Key words: S. epidermidis, biofilm, methicillin resistance

Clonal Dissemination of Biofilm Producing Methicillin Resistant Staphylococcus aureus Strains Isolated from Patients with Urinary Tract Infection in Tehran, Karaj and Isfahan during 2018

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Abstract

Background and objective: Methicillin-resistant *Staphylococcus aureus* (MRSA) is a deleterious human pathogen responsible for severe persistent and recurrent biofilm-mediated urinary tract infections (UTI) which has a significant negative impact on patient health. In this study the clonal dissemination of biofilm producing MRSA strains isolated from patients with UTI in Tehran, Karaj and Isfahan was determined using different typing methods.

Materials and methods: During 2018, a total 0f 295 *S. aureus* strains were collected from patients with UTI in hospitals of Tehran Karaj and Isfahan and were identified using specific primers for *nuc* gene. Disk diffusion method using cefoxitin disk by the guidelines of the clinical and laboratory standards institute (CLSI) and also polymerase chain reaction (PCR) by the specific primers for *mecA* gene were used for determination of MRSA strains. The ability of MRSA strains to produce biofilm was tested using qualitative Congo red agar and quantitative microtiter plate assays. A combination of molecular prophage typing, SCC*mec* typing and *agr* typing methods were employed for typing of biofilm producing MRSA strains.

Results: Totally, 83 MRSA strains (28%) were isolated from patients in all 3 cities and prevalence of resistant strains in Tehran, Isfahan and Karaj was 31, 28 and 23%, respectively. Using qualitative Congo red agar plate assay 80, 54 and 86% of strains isolated from Tehran, Karaj and Isfahan were slime positive and prevalence of biofilm producing strains in Tehran, Karaj and Isfahan was 70, 54 and 76% respectively. Four different prophage types SGA, SGB, SGF and SGL, 2 subtypes (SGFa and SGFb) and 4 prophage patterns were identified in which 3 patterns were common among strains isolated from all 3 cities. SCC*mec* types III, IV and V and 4 *agr* types were also detected among biofilm producing MRSA strains.

Conclusion: Presence and persistence of clonal groups of biofilm producing MRSA strains harboring similar typing patterns among patients in Tehran, Karaj and Isfahan, indicating the common origin and also widespread of such strains in Iran.

Key words: MRSA, typing, UTI, prophage, SCC*mec*, *agr* typing

Anti-Biofilm Effect of Melittin Peptide on Clinical Isolates of Pseudomonas aeruginosa Isolated from Hospital Burn Infections

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Abstract:

Background and objective: Biofilm is accumulation of microorganisms that are attached to a surface and they are coated with extracellular polymeric materials. Sometimes biofilm can be considered as a strategy that some microorganisms use to prevent harmful effects which are maintained in the natural environment and the host body. The purpose of this study was to evaluate antibiofilm effect of melittin peptide on clinical isolates of *Pseudomonas aeruginosa* isolated from nosocomial burn infections.
Materials and methods: In this study, the rate of biofilm reduction and biodegradation kinetics of melittin on *Pseudomonas aeruginosa* biofilm were measured by microtiter plate crystal violet assay. The lack of growth in the MHA (Molar Hinton Agar) medium and decreasing in wavelength indicates the effect of melittin peptide on *Pseudomonas aeruginosa* biofilm.
Results: The results showed that melittin was able to degrade the biofilm within 2 hours and killed the embedded bacteria. Melittin inhibited or eliminated all bacteria at the amount of 4 and 8 µg while at 50 µg biofilm layer was destroyed and all bacteria within the biofilm were killed after 24 and 48 h.
Conclusions: The results of this study are valuable while they increased the hope for treatment of *pseudomonas* associated infections in third degree burns patients.

Keywords: Biofilm, *Pseudomonas aeruginosa*, Burn infection, Antimicrobial peptide, Melittin

Epidemiology of Malaria in Jahrom County, South of Iran 2006-2017

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Abstract

Background and objective: Malaria is one of the most important health problems in many countries. The purpose of this study was to investigate the epidemiology of malaria in Jahrom in south of Fars province, Iran.
Materials and methods: This analytical-descriptive study were used epidemiological data of all patients. The Annual Blood Examination Rate (ABER), Slide Positivity Rate (SPR), and Annual Parasite Incidence (API) indices were calculated and analyzed at two descriptive and inferential statistics levels.
Results: A total of 156 malaria patients, all of whom were male. The mean age of studied population was 25.9 ± 9.9 years. Plasmodium vivax was the high prevalent parasite (93.6%),5.8%of patients with Plasmodium falciparum parasite and 0.6%Both species were infected with the parasite. The most Incidence of parasites of Malaria was seen in 2008(0.116In 100 thousand people)and The lowest was in year 2015(0.008In 100 thousand people). Also 78.9% of patients were citizens of Pakistan and Afghanistan and 21.1% were Iranians. 72.4% of cases were "imported" in terms of epidemiological classification. The Annual Blood Examination Rate (ABER) and Annual Parasite Incidence (API)during these years have a decreasing trend with the highest incidence of disease in spring(41.02%)and 57.7% of cases detected in the public sector,no deaths from the disease were reported.
Conclusion: According to the movement of illegal foreign nationals in this city due to the existence of palm and citrus orchards and also considering the presence of vector mosquitoes, disease care programs should continue in this area.

Keywords: Epidemiology, Malaria, Vivax, Jahrom