Food Components with Anti-Helicobacter Pylori Aactivities.

Reweive article

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Abstract

Helicobacter pylori (HP) infection which has been reported prevalent in developing countries is known as the major cause of most types of gastritis, gastric ulcers and gastric cancer. Although the eradication of this infection is considered as one of the health priorities, the antibiotic resistance impedes routine treatment in many cases. Several preclinical studies have demonstrated the efficiency of some natural products against *H. pylori* infection. These results may be rejected or confirmed in humans. Our purpose is to review the food items that have been tested against HP infection in clinical trials. We searched for related articles in scientific databases (Google scholar, PubMed, Science Direct and SID) using related keywords without Custom date range**.** Probiotics, lactoferrin of milk, black seed and products of maillard reaction probably increase the eradication rate and reduce the medication induced side-effects such as nausea, diarrhea and abdominal pain. Also medium or short-acting anti-HP effect of virgin olive oil, broccoli and cranberry, are reported too. Utilizing anti-bacterial natural ingredients seems to improve the impression of medicinal therapy. In order to accurately determine the effective dose and preparation of the mentioned natural products further clinical trials are needed.

Keywords: **Helicobacter pylori, food, diet, natural product**

Comparison of the Antimicrobial Properties of Mmethanolic Extracts and Essential oils of Trachyspermum capticum on E.coli and Enterococcus faecalis

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Abstract

Background and objective: Trachyspermum capticum plant is from Apiaceafamily of essential oil and seed extract of this plant contain compounds that show its biological properties. The aim of this study was to investigate and compare the antimicrobial activity of essential oil and methanolic extract of herbs.
Materials and methods: The chemical compounds of this medicinal plant were analyzedby GC-MS and 7 components were identified, representing 85% of its total essential mass. The antibacterial properties of these agents were evaluated by determining the minimum inhibitory concentration (MIC) and minimum inhibitory concentration (MBC) against *E. coli* and *Enterococcus faecalis* bacteria with microdillution method, and the functional groups of the compounds were investigated using FTIR analysis.
Result: Results showed that the EO Trachyspermum capticum was formed by the main components of (Thymol 30%), (Limonene 21%) and (gamma-terpinene 19%). Factor groups derived from the resulting curves indicate that the flavonoid compounds in the extract have been shown to have antioxidant and antimicrobial properties. The results for the methanolic extract (MIC) were 15.62 mg/ml against *enterococcus faecalis* bacterium and 31.25 mg/ml against *E.coli* and MBC 125 mg/ml against *enterococcus faecalis* and 5.62 mg/ml is obtained against *Escherichia coli* bacteria. MIC and MBC of this species were found against *Enterococcus faecalis* 5 mg / ml bacteria and against *E. coli* (0.625mg/ml).
Conclusion: Essential oils and its methanolic extract play an important role in antimicrobial activity and its essential oil is much stronger than its extract. The presence of flavonoids in this plant is due to this biological property.
Key words: Trachyspermum capticum, extract, Essential oil, antimicrobial

Evaluation of KPC-2 and OXA-10 Type of Extended- Spectrum β-Lactamase (ESBL) Genes in Clinical Isolates of the Pseudomonas aeruginosa and Acinetobacter Baumanii

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Abstract

Background and objective: Existence of extended spectrum B-lactamase (ESBL) genes plays an important role in spreading of β-lactam antibiotic resistance in the strains producing of these enzymes. The resistance of gram-negative bacteria, to different antimicrobial agents, especially β-lactam and carbapenem, has increasingly been reported. This study was conducted to determine antibiotic resistance and the prevalence of KPC-2 and OXA-10 β-lactamases in *P. aeruginosa* and *A. baumannii* isolates by Duplex PCR.

Materials and methods: In this study, non-fermentative bacilli collected from Alinasab and Shohada hospitals in Tabriz and Imam Khomeini hospital in Uremia, were subjected to bacteriological tests. The samples were cultured and identified according to standard methods the antibiotic resistance and antagonistic effects of drugs consumed and Determine of multidrug-resistant strains (MDR) were assayed by Disc diffusion Agar method. MIC determination imipenem and piperacillin antibiotics was conducted by E-test method. Phenotypic detection of extended-spectrum β-lactamase enzyme (ESBLs) by using disk diffusion Agar Method (ceftazidime, ceftriaxone, Aztronam) and Combined Disk Method. DNA of studied bacteria was extracted by DNA extraction Kit and examined for the existence of KPC-2 and OXA-10 gene by Duplex PCR method using 16srRNA specific primers.

Results: Most of *Pseudomonas aeruginosa* isolates were resistant to carbenicillin (72.7%) and *Acinetobacter baumannii* isolates of the carbenicillin, ceftazidime, ceftriaxone and aztreonam (92.9%). Antagonistic effects of imipenem with ceftazidime, ceftriaxone, Aztronam and Pipracillin were observed in 25.7%, 22.7%, 19.6% and 6.6% in *pseudomonas aeruginosa* isolates, respectively. Meanwhile, this effect was not observed in *Acinetobacter baumannii* isolates. Fifty-three isolates (66.25%) From studied ones were identified as MDR. Most of the resistance by E-test in both strains, Pseudomonas aeruginosa 38 (100%) and Acinetobacter baumannii 10 (90.9%) was observed compared to piperacillin. In this study, from 80 non-fermentative isolates, 29 (36.2%) were ESBL positive phenotypically. In spite of that from all isolates, 53(66.2%) and 57(71.2%) were shown KPC-2 and OXA-10 genes respectively. Depending of bacteria the KPC-2 gene in *P. aeruginosa* and *A. baumannii* (69.7%, 50%) and OXA-10 type were (72.7%, 64.3%), respectively.

Conclusion: Due to extensive acquisition of drug resistance genes in clinical isolates, According to the results of Antibiotic for treatment in hospitals not enough and the need for continuous monitoring of strains generating broad-spectrum beta-lactamase enzymes and extensive carbamazepines and periodic changes in the treatment protocol for infections.

Keywords: *ESBLs, Pseudomonas aeruginosa, Acinetobacter baumanii*, KPC, OXA, MIC

Isolation of Biofilm Producing Methicillin Resistant and Methicillin Sensitive Staphylococcus aureus Strains from Patients with Urinary Tract Infection in Isfahan

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Abstract

Background and objective: *Staphylococcus aureus* is one of the most common causes of a variety of infections ranging from simple wound infections to complicated urinary tract infections (UTI) in hospital and community. During past decades, resistance of *S. aureus* to different classes of antibiotics such as methicillin has increased which making infections by these bacteria difficult to treat. The aim of this study was the isolation and determination of antibiotic resistance pattern of biofilm producing methicillin resistant and methicillin sensitive *S. aureus* strains from patients with urinary infection in Isfahan during 2015-2017.

Materials and methods: During 2 years a total of 729 urine samples were collected from patients in a referral hospital in Isfahan. All isolates were identified using Polymerase Chain Reaction (PCR) with specific primers and the ability of strains to produce biofilm was tested using qualitative Congo red agar and quantitative microtiter plate assays. The resistance of biofilm producing methicillin resistant and sensitive strains to 15 antibiotics was examined.

Results: Totally, 294 *S. aureus* strains were identified using PCR test, in which 50.7% of strains were slime producers and 102 strains were classified as biofilm producing strains. Among biofilm producing strains, 56.9% were resistant to cefoxition and showed high rate of resistance to penicillin, erythromycin and ciprofloxacin. Except for chloramphenicol, significant difference was observed among methicillin resistant and methicillin sensitive strains for resistance to different classes of antibiotics. Moreover, all of the strains showed susceptibility to linezolid and quinupristin-dalfopristin.

Conclusion: Presence and persistence of highly resistant biofilm producing strains among patients in this hospital, indicating the widespread and transmission of such strains in the hospital.

Keywords: *Staphylococcus aureus*, methicillin, biofilm, urinary infection, antibiotic resistance

Daptomycin Resistance among Methicillin Resistant Staphylococcus aureus Strains

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Abstract

Background and objective: Methicillin-resistant *Staphylococcus aureus* (MRSA) has a great potential to acquire resistance to antimicrobial agents, which made treating of infections much more challenging. The aim of this study was to determine the daptomycin resistance of MRSA strains isolated from catheterized patients with urinary tract infection (UTI) in Tehran during 3 years.
Materials and methods: A total of 419 *S. aureus* strains isolated from patients were identified using specific primers. MRSA strains were also detected using cefoxitin disk and specific primers for *mecA* gene; and minimum inhibitory concentration (MIC) of oxacillin was also determined. Moreover, the presence of different types of SCC*mec* and *ccr* types were also showed. All MRSA strains were also tested for susceptibility to daptomycin by disk diffusion method.
Results: One hundred and eight cefoxitin resistant and *mecA* positive *S. aureus* strains were detected among isolates in which 97% harbored SCC*mec* type III and were positive for type 3 *ccr*. On the other hand, SCC*mec* type IVa and type 2 *ccr* were also detected in 3% of MRSA strains. Moreover, among MRSA strains 56% showed resistance to ≥256 µg/ml oxacillin and using disk diffusion method, 86% of MRSA strains were also resistant to daptomycin.
Conclusion: The results of this revealed that daptomycin is not a drug of choice for treatment of patients with UTI in this hospital.
Keywords: **Methicillin-resistant *Staphylococcus aureus*, daptomycin, antibiotic resistance**

Potential Threat in Control of Hospital Infections Associated with Mobile Phones in Healthcare Setting

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Abstract

Background and objective: This study was conducted to determine microbial contamination of mobile phones in Headworkers of the Rasool Akram hospital, in Tehran,Iran, and identify the most important microbial species associated with these phones .
Materials and methods: The analysis of a total of 130samples was done to identify fungal and bacteria isolates. Sterile swabs were firmly passed on the handset, the buttons and the screens of mobile phones, and then inoculated into media of bacteria and fungi. Frequency distributions of isolates were calculated.
Results: There were 34isolated of the following bacteria: *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Pseudomonas aeruginosa*, *Bacillus spp*, and *Enterobacter aerogenes* at the rate of 23.5%,23.5%,2.9%,23.5% and 11.7%, respectively. There were 3fungal isolates as follows: *Aspergillus fumigatus*, *candidia spp* .
Conclusions: The study showed that all mobile phones under consideration were infected by several microbes, most of which belonged to the natural flora of the human body as well as airborne fungi and soil. This means that it is necessary to sterilize hands after contact with a phone since it is a source of disease transmission.
Keywords: mobile phones, *Bacillus, Aspergillus, Enterobacter*