

Antibacterial Effect of Zink Oxide Nanoparticles on Drug Resistant Viridans Group Streptococci Isolated from Dental Samples of Pupils

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Abstract

Background and objective: Dental caries is one of the most common infections in children which is mainly caused by the bacteria living in the mouth. Viridans group Streptococci are the most common microbes which have a very close relationship with this infection. The aim of the present study is to review the antimicrobial effect of Zink oxide nanoparticles on the growth of drug resistant viridans Streptococci isolated from pupils.

Material and methods: This cross-sectional study has been conducted randomly on 120 elementary school pupils. After sampling, biochemical tests were carried out to identify Streptococcus viridans strains. The susceptibility to various antibiotics was evaluated using disk diffusion method and the antibacterial properties of Zink oxide nanoparticles were assessed through agar well diffusion method. Data analysis was performed using chi-square and one-way variance tests.

Results: In this study, the frequency of viridans group Streptococci in dental samples of children was reported to be 66.7%. The most antibacterial resistance was to Vancomycin with the frequency of 81%. Also, 81% of the isolated streptococci were susceptible to Amoxicillin. The next frequent susceptibilities were seen to Cefotaxime with 56%, Erythromycin with 27%, Vancomycin with 19% and Clindamycin with 11%. In the well diffusion method, 72% of the strains resistant to Erythromycin and Clindamycin, 92% of the strains resistant to Cefotaxime and Amoxicillin, and 78% of the strains resistant to Vancomycin were destroyed in the concentration of 50 mg/ml of the Zink oxide nanoparticles, and the rest were destroyed in concentration of 100 mg/ml of these nanoparticles.

Conclusion: Zink oxide nanoparticles used in this study showed a very high antimicrobial effect against all drug resistant viridansgroup Streptococci, and the bactericidal effects were increased upon increasing the concentration of nanoparticles.

Key words: Viridans group Streptococcus, Children, Tooth Decay, Zink oxide Nanoparticle, Drug resistance

Bacterial Contamination Status of Automated Teller Machine Keyboards Islamabade Gharb city in 2016

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Abstract

Background and objective: A lot of people every day to do their banking transactions from Automated Teller Machine. In case of contamination Automated Teller Machine keyboard as the center of the action pollution and contamination transferred to future users. This study aimed to investigate bacterial contamination Automated Teller Machine keyboard was conducted in the city of Islamabad gharb.

Materials and methods: In this cross-sectional study, 53 Samples of the Automated Teller Machine keyboard of Islamabad Gharb city were taken and moved to the lab. In the laboratory, using standard diagnostic methods of bacteriology, including staining, biochemical tests and culture in differential, selective and specific media were isolated of gram positive and negative bacteria.

Results: Based on the results all 53 samples were contaminated by bacteria. The most frequent bacteria isolated *Escherichia coli* (37.72 percent) and lowest frequencies of *Enterobacter* (1.89 percent) and *Diphtheroids* (1.89 percent). The antibiotic resistant strains of *Staphylococcus aureus* isolates, respectively the highest and lowest resistance was to penicillin 92.8 percent and vancomycin 9.44 percent. The number of bacterial genera isolated keyboard appearance and cleanliness there was a significant relationship ($p < 0.05$).

Conclusion: Due to contamination by pathogenic bacteria samples, education of personal hygiene in members, Regular cleaning and disinfection devices and the use of antibacterial materials in the structure of the keyboard in order to control and reduce pollution is effective.

Keywords: ATM systems, bacterial contamination, antibiotic resistance.

Microbiological Quality of Sauces from Restaurants in the YAZD, IRAN

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Abstract

Background and objective: The purpose of this investigation was to determine the microbiological safety of sauces served in restaurants in YAZD, IRAN. Sauces, common oriental primers, are a traditional ingredient used throughout the world. These sauces were provided under low hygienic conditions of handling and selling. Nowadays, little information is known about its role in the transmission of food borne diseases (FBD). Evidence from trials indicated that cross-contamination risks because of poor hygiene during food handling and preparation within these premises is of emphasis. The European Commission Regulation No. 852/2004 on the hygiene of foodstuffs supplies a risk-based approach to controlling food hygiene.

Materials and methods: In this cross- sectional study, 63 sauces from restaurants were collected during summer 2017. The samples were transported to food laboratory under sterile condition and analyzed using methods specified for *Escherichia coli*, mold and yeast.

Results: Results were compared with Iranian national standards protocols. Comparison with published microbiological guidelines showed that 1.6%, 6.3%, 15.9% of sauces samples were of unsatisfactory microbiological quality due to *Escherichia coli*, mold and yeasts. 1.6 % of these samples were positive for mold and yeast, together.

Conclusion: In conclusion, results emphasize the need for suitable hygiene methods in restaurants for checking these items of products.

Keywords: sauces, microbial assessment, *Escherichia coli*, mold, yeast.

Prevalence of Community Acquired Pneumonia Caused by *Mycoplasma pneumoniae* in Hospitalized Patients in Arak City 2016-17

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Abstract

Background and objective: Community-acquired pneumonia (CAP) is an acute infectious disease of respiratory system. CAP is a common and potentially serious illness and is associated with considerable morbidity and mortality particularly in elder adult patients and those with significant comorbidities. One of the important causes of pneumonia is *Mycoplasma pneumoniae* which has a mild course and rarely leads to hospitalization. In this study we aimed to determine the prevalence of pneumonia caused by *M. pneumoniae* in hospitalized patients in Arak city.

Materials and methods: This study was conducted in 415 hospitalized patients older than 18 years, diagnosed with CAP in Valiasr hospital in Arak city. Pharyngeal swabs or sputum were taken from all patients and tested for *M. pneumoniae* by real time PCR.

Results: A total of 415 cases with mean age 53.73 ± 19.88 years were enrolled in the study. 54.7% of them were men and 45.3% were female. *M. pneumoniae* was detected in 9.4% of patients. Cases were infected with *M. pneumoniae* had significantly lower age compared to patients with pneumonia due to other pathogens (P value: 0.001). The highest incidence of mycoplasma pneumonia was observed in the spring and summer.

Conclusion: This study showed that *M. pneumoniae* is causative agent of pneumonia in 9.4% of hospitalized CAP patients. Due to highest prevalence of mycoplasma pneumonia in spring and summer and in younger cases, *M. pneumoniae* should be considered as a causative agent of pneumonia in younger hospitalized CAP patients in these seasons.

Key words: *Mycoplasma pneumoniae*, Community Acquired Pneumonia (CAP), Arak

Isolation of Methicillin Resistant *Staphylococcus aureus* Strains from Hospital Sewage in Tehran in 2015

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Abstract

Background and objective: *Staphylococcus aureus* is known as a bacterial pathogen responsible for a wide range of human infections in hospitals and communities that are difficult to treat. The aim of this study was isolation and determination of antibiotic resistance patterns of methicillin-resistant *S. aureus* strains isolated from treated hospital sewage in Tehran during 2015.

Materials and methods: The filtration system and the oxacillin containing chromogenic Hicrome *aureus* agar medium was employed to isolate methicillin resistant bacteria. All isolates were identified at the species level using standard biochemical tests and also PCR assay using specific primers for *nucA* gene, and the presence of *mecA* gene was also tested. Susceptibility of all MRSA strains to 17 antibiotics was determined using disc diffusion method according to guidelines of Clinical Laboratory and Standard Institute (CLSI). Minimum inhibitory concentrations (MIC) of oxacillin and vancomycin were also detected using broth microdilution assay

Results: All 79 isolated colonies from the oxacillin containing medium showed resistance to cefoxitin and were also positive for *nucA* and *mecA* genes and were identified as MRSA. All MRSA strains were susceptible to vancomycin, linezolid, quinopristin-dalfopristin and chloramphenicol. Their resistance to penicillin, ciprofloxacin, kanamycin, tobramycin, erythromycin, amikacin, tetracycline, clindamycin, rifampin, trimethoprim-sulfamethoxazole, minocycline, gentamicin and nitrofurantoin were 100, 92, 89, 89, 87, 79, 79, 79, 62, 58, 48, 45 and 3% respectively. In this study, 25 antibiotic resistance patterns were identified in which 8% of strains showed susceptibility to all classes of antibiotics except for penicillin and 92% of strains were resistant to 3-12 antibiotics.

Conclusion: The results of the present study illustrated the presence and persistence of highly resistant different clonal group of MRSA strains in treated hospital sewage. Emergence of these highly resistant potentially pathogenic bacteria in the treated sewage in Tehran could be a serious threat for the public health, which indicating the needs of urgent review to improve the efficiency of hospital sewage treatment systems.

Keywords: Methicillin-resistant *Staphylococcus aureus*, hospital sewage, Antibiotic resistance pattern

Cutaneous Leishmaniasis in Jarqavieh, Isfahan, 2014-2017

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Abstract

Background and objective: Cutaneous Leishmaniasis is one of the most frequent and most common native diseases in Iran and is ranked second in spreadable parasitic diseases after Malaria. The cases of Cutaneous Leishmaniasis have increased in Isfahan province, and in the recent years, a lot of cases have been reported by the Central Hospital Laboratory of Jarqavieh, Isfahan. Due to the geographical location of Jarqavieh and its adjacency with Gavkhouny swamp, a research was done with the aim of investigating the prevalence of leishmaniasis in the place for a period of three years.

Materials and methods: This is a descriptive cross-sectional study. The data was collected from March 21, 2014 to the end of March 2017. Sampling was done in a convenient way by referring to the laboratory of Imam Khomeini Central Hospital of Jarqavieh, Isfahan and detecting suspicious patients among 24 urban and rural areas of Jarqavieh. The lesions of all suspected individuals were sampled and stained in six steps. At the end of the study, the collected data and the obtained statistics were analyzed by using the Excel software, version 2013.

Results: Data analysis showed that the highest number of positive cases was in the years 2014 and 2015. Meanwhile, men account for the most in all three years. The highest frequency of infection was observed among the age group 10 - 19 years (26.4%) in 2014 and among the age group 1 - 9 years in 2015 (33.3%) and 2016 (31.1%). Among the patients diagnosed during these three years in succession, the largest population lived in the cities. Regarding the location of the lesion, each year, the most lesions were in the hands (38.6% in 2014, 30.3% in 2015, and 23.8% in 2016).

Conclusion: Based on the obtained results, it is suggested that the cleaning of the localities from the waste be carried out more carefully and the animal reservoirs related to this disease should be identified in each city and village and combated with appropriate methods. A better understanding of the vector and agent of the disease and its reservoirs helps prevent, control and treat Cutaneous Leishmaniasis in Jarqavieh, Isfahan.

Keywords: Epidemiology, Cutaneous Leishmaniasis, parasitic diseases

Epidemiology of HIV Transmission Routes in Jahrom County, Fars Province Islamic Republic of Iran 2017

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Abstract

Background and objectives: Acquired immunodeficiency syndrome (AIDS) refers to disorders caused by a defect in the functioning of the human immune system that occurs due to infection with human immunodeficiency virus (HIV). The HIV transmission routes include injecting drug use, sexual transmission, occupational transmission, transfusion of blood components and mother-to-child transmission. Hence, this study was conducted to investigate the frequency of HIV transmission routes in people infected with HIV in Jahrom County, Iran.

Materials and methods: The present cross-sectional study was conducted by a census method on 73 HIV-positive subjects and AIDS patients in Jahrom County with active and available records during a certain period in 2017. Data were analyzed by SPSS16 and Excel 2013 software using descriptive statistics and Chi-square test at a significance level of 0.05.

Results: In examining potential routes of disease transmission, except for five cases of mother-to-child transmission, the transmission route was unknown in none of the remaining 68 people. The most frequency of the transmission route was related to injecting drug use (58.9%), followed by history of tattoo (57.5%), high-risk sexual behavior (56.2%), dentistry, surgery and endoscopy (39.7%), injuries in the barbershop (16.8%), bloodletting (12.3%), and blood transfusion (6.8%), respectively.

Conclusion: The most frequency route of transmission was the injecting drug use. Therefore, the injecting drug users (IDUs) are at high risk for HIV infection, and further attention should be given to these vulnerable groups within the educational programs.

Keywords: AIDS, Transmission Routes, Epidemiology, Jahrom