

Antimicrobial Properties of ZnO Nanoparticles

Visi Malekshahi Z, Afshar D, Ranjbar R, Shirazi MH, Rezaei F, Mahbobi R, Pakbaz Z, Hajikhani S*

* mhshirazi@tums.ac.ir

Abstract

Background and objective: The ZnO nanoparticle has an antibacterial activity against gram positive and gram negative bacteria. The aim of this study was to determine the relation between Corona and ZnO nano particle absorption, Also its effect on bacteria causing nosocomial infections.

Material and methods: The samples of six nylon made fabric with the dimension of 20 by 20 cm² dimension were prepared and were washed for preparing corona discharge. The corona discharge was done in six different situations. After preparation of Nano-particle samples and medium, Staphylococcus aureus and Escherichia coli were cultured on trypticase soy agar medium and incubated at 37°C for 24h. Finally anti-bacterial power of nano-particle was measured.

Results: Our results showed that the antibacterial activity of ZnO increased by increasing of corona power and time of plasma and number of colonies were decreased.

Conclusion: The rate of antibacterial property of ZnO nanoparticle is proportional with corona power and deposition that is shown the absorption level of ZnO nano particle on samples. The finding of study indicates the fabric-with nano ZnO particle is a promising method in eliminating of bacteria.

Key words: ZnO nano particle, Staphylococcus aureus. E.coli.

Separation of *Vibrio cholerae* O-1 Using Functionalized Magnetic Nanoparticles

Rashidiany J, Kamaly M, Ranjbar R, Javady HR, Hosaeny H*

*Ranjbarre@gmail.com

Abstract

Background and objective: Cholera is a disabling infectious disease that is caused by *Vibrio cholerae* O-1 & O-139. The current procedures for the detection and enumeration of *V. cholerae* bacteria can often be costly in labor, materials, and time. The aim of this study was to evaluate the separation of *V. cholerae* O-1 using Immunomagnetic separation.

Materials and methods: In this study, the polyclonal antibody against bacterial surface antigen (ompW) was immobilized on magnetic iron oxide nanoparticles and this approach was used to isolate bacteria from environment. Immobilizing process was applied using the 11-MUA in the presence of EDC and NHS. To confirm the immobilizing process, two methods (FTIR spectroscopy and Bradford protein assay) were used. Bacterial strains from two medical centers of Tehran clinical samples were collected and identified using biochemical methods.

Results: Functionalized iron oxide nanoparticles with antibody against ompW was successfully accomplished. Nanoparticles were added to the environments containing bacteria and applying magnetic fields, the bacteria were isolated from the buffer. This method can isolate *V. cholerae* O-1 bacteria up to 2cfu from buffer samples. Culturing the bacteria attached to nanoparticles in specific media confirmed this isolation method.

Conclusions: The results showed that, in comparison to other separating methods, this technique is more powerful.

Keywords: *Vibrio cholerae*, Surface proteins (omp), Polyclonal antibody, Cholera, Immunomagnetic separation

Common Types of Staphylococcus aureus Enterotoxin in Meaty Foods

Tavakoli HR, Jodaei AA, Imani Fooladi AA, Sarshar M, Rafati H, Asadi Baghasiab B*

**imanifouladi.a@gmail.com*

Abstract

Background and objectives: Staphylococcus aureus has known as one of the most common causes of food poisoning in the world. The survey of contamination to S. aureus enterotoxin and detection of current types in high consumption foods is very important. The aim of this study was to survey of high consumption prepared meaty foods to S. aureus enterotoxin types in one of the military centers in Tehran, Iran.

Materials and methods: In this descriptive-analytical study, 96 samples of four types of high meaty foods were collected randomly in one of Tehran's military centers and after counting the number of bacteria in the samples. The most common types of enterotoxin were by serological method. Results were analyzed by SPSS software and statistical tests.

Results: In this study, 85.4% of raw food and 12.5% of cooked food were contaminated with excessive standard respectively and contamination to S. aureus enterotoxin was confirmed in 9.57% of the samples. Also A (56%) and D (44%) were determined as the most common enterotoxin types. The most contamination rate to enterotoxin was observed in 25% and 16.7% in raw Kebab and cooked Kofteh respectively.

Conclusion: The results of this study showed that some served foods in this military center have high contamination that can threaten employee's health. Training of staffs in preparing and distributing food and control of health authorities can be effective in reduce of food contaminating.

Key words: Staphylococcus aureus, Enterotoxin, Meaty foods, Military centers

Factors Associated with Delay in Diagnosis of Tuberculosis in Ardabil Province

*Habibzadeh Sh, Ghobadi H, Pourfarzi F, Barak M, Hazrati S, Moini A, Khakig N, Salehzadeh F, Aghabalaii Danesh M, Ghasemi A, Anari H, Moaied Nia N, MirzaAghazadeh M, Sadeghi A, Behboudi S, Gharibani MM, Mehrpour R, Allaf Asghari A, Kamalnia F, Jamali E, KHanjani G, Pourmohammad jan N**

* n.Pourmohammadjan@arums.ac.ir

Abstract

Background and objectives: Transmission of tuberculosis occurs usually by aerosols, Produced with patient's cough. So early diagnosis and proper treatment of patients as a disease reservoir, has a special importance. It seems that every TB patient can infect 10 to 15 people annually during contagion period. For these reasons this study has been planned to evaluate delay time in TB diagnosis.

Material and methods: This is a descriptive analytical cross sectional study performed among all of the TB patients diagnosed in 18 months of study in Ardabil province (from April 2010 to September 2011). Data for questionnaire was collected with interview and analysis, was done with SPSS software version 16. ANOVA, t test, chi-squared statistical tests were used for hypothesis assay.

Results: 126 patients whom diagnosis confirmed by scientific tuberculosis committee of province were entered the study. 68 patients (54.4%) were smear positive. Mean, standard deviation and median for these patients were 43.8, 64.3, 20 days respectively. The same numbers for smear negative patients were 43.4, 70.7, and 21 days. There was not any significant statistical difference between smear negative and smear positive patients in patients delay. ($P=0.9$) the same numbers for diagnosis delay for smear positive versus smear negative patients were 15.6, 22.1, 5 days and 46.2, 49.2, 24 days respectively. This difference was significant statistically ($P=0.000$). With definition of patient delay as medical request after 14 days symptomatic illness, it was revealed that only 38.3% of smear positive patients were returned to any treatment centers in fewer than 14 days of symptoms onset. Despite this, proper diagnosis was made in 70.1% of smear positive patients in less than 15 days. Marital state, less than high school education, residence in villages were associated with patients delay. Symptomatic productive cough were associated with reduced latency of diagnosis.

Conclusion: Greater patients delay for treatment request was associated with decrease in diagnostic delay. Delay in diagnosis of smear negative pulmonary tuberculosis and extrapulmonary tuberculosis was more than smear positive pulmonary tuberculosis. The most delays in reaching the correct diagnosis are related to patient. Increasing public knowledge about signs and symptoms of tuberculosis and disease spread ways, along with increasing access to health care services can be useful strategies.

Key words: Delay, tuberculosis, diagnosis, Ardabil

Adherence to International and National Prophylaxis Guidelines in Surgical Wards of Boali hospital in Tehran in 1390

*Safargholi Sh** , *Mousavi F* , *Faghani Y* , *Najari S*

*shadi.safargholi@gmail.com

Abstract:

Background and objective: Inappropriate use of antibiotics causes increase micro organism's resistance, drug side effects and costs. Drug utilization review studies are suitable means of drug use evaluation and revealing immethodical drug utilization trends and proposing proper solutions.

Materials and methods: This is a cross sectional statistic study for evaluation the appropriateness of antibiotic prophylaxis administered before surgery .This study was performed on all patient of surgical wards in an educational hospital in Tehran for three firs months of 1390.Essential data (such as demographic data, appropriate decision making for administration, antibiotic dose, dosing interval, total duration of administration) were collected through a questionnaire designed by authors. Data was analyzed by SPSS19 software.

Results: Of 252 patients who entered the study 189 cases (75.8%) had received antibiotics appropriately according to the ASHP guideline and 182 cases (72.2%) according to the national guideline.

In 50.4% and 36.1% appropriate antibiotic were chosen according to the ASHP and national guideline respectively. Timing of firs dose was appropriate in 53.6% according to the ASHP guideline and 52.8% by national guideline. Total duration of administration was appropriate in 19.42% and 15/1% according to ASHP and national guideline respectively.

Conclusion: There is a remarkable incoherence between current use and the designed protocol; therefore more attention should be paid to available guidelines.

Key words: Antibiotic, prophylaxis, surgical site infection, Drug Utilization Review (DUR)

Phenotypic and Molecular Evaluation of ESBL Production among E.coli Strains Isolated from Orthopedic Wounds

Kayvani H, Hakemi Vala M*, Talebnia Chalanbar Z, Mirbagheri F, Bagheri Bejestani F

* mojdeh_hakemi@yahoo.com

Abstract

Background and objective: *Escherichia coli* strains are a member of Enterobacteriaceae which are commonly isolated from orthopedic wounds. Recently, by ESBL production, E.coli strains are resistant to most common antibiotics and causes strong worldwide problem in treatment. The aim of this study was evaluation of ESBL production among E.coli strains isolated from orthopedic wounds of Firozgar and Akhtar hospitals during 1389-90 by phenotypic and molecular methods.

Materials and methods: During 1389-90(2011), 60 orthopedic wounds were collected from Firozgar and Akhtar hospitals by sterile condition. The E.coli strains were isolated and identified based on bacterial and biochemical standard methods. Their resistant evaluated against common antibiotics by disk diffusion method (CLSI standard). ESBL screening was done by phenotypic DDST/DDT methods. Consequently, DNA was extracted by kit and the frequency of TEM, SHV, PER-1 genes were evaluated by PCR method.

Results: Of 60 collected orthopedic wounds from Firozgar and akhtar hospitals, E.coli strains (48.33%) was detected. Their resistant to tested antibiotics by Kirby-Bauer method were, 41.73% to cefpodoxim, 68.96% to cefotaxim, 51.72% to ceftazidim, 48.27% to cephalexin and gentamicin, ciprofloxacin, chloramphenicol, cefepime and imipenem 44.82%, ceftriaxone 41.37% and aztronam 34.48%. By DDST/DDT methods, 50.00% of E.coli strains were ESBL positive. The frequency of SHV, TEM and PER-1 were 33%, 33% and 50%, respectively by PCR method.

Conclusion: Based on searches, ESBL production in E.coli strains is mostly related to CTX-M, SHV, TEM genes and PER-1 was detected before in *Pseudomonas* spp, *Acinetobacter* spp, *Proteus* spp. The co-existence of PER-1 was reported in 7.5% of *Klebsiella* strains in Iran. Based on data, this is the first time that PER-1 was detected in E.coli strains without existence of any other ESBL genes. However, the confirmation of this results need more sample size, sequencing and comparison the results by data bank.

Key words: E.coli ,PER-1,ESBL

Seroepidemiology of Hepatitis E Virus Infection in HIV Infected Patients

*Eslamifar A, Aghakhani A, Mohraz M, Banifazl M, Foroughi M, Sharif MR, Ansari F, Bolandghamat Z, and Ramezani A**

*amitisramezani@hotmail.com

Abstract

Background and objective: Hepatitis E virus (HEV) is considered as a self-limited viral disease in tropical and subtropical countries which is transmitted as oral-fecal route. Some studies showed that HIV infected patients acquire HEV infection more frequent. This study was aimed to determine the seroepidemiology of HEV infection among HIV positive patients.

Materials and methods: In this study 134 HIV infected patient and 52 matched healthy controls were enrolled. All cases were evaluated for the presence of anti-HEV antibodies (IgG and IgM) using ELISA.

Results: Out of 132 HIV patients, 16 (11.9%) and out of 52 controls 6 (11.5%) were anti-HEV IgG positive. There is no significant difference between case and controls regarding anti-HEV IgG seroprevalence. Anti-HEV IgM was negative in all cases and controls. There was no association between anti-HEV IgG seropositivity and age, sex, possible route of HIV acquisition, aminotransferases levels, CD4, antiretroviral therapy, HBV and HCV co-infection

Conclusion: Our survey showed that HEV seroprevalence was similar in HIV infected patients and controls; therefore these patients are not at high risk for acquisition of this infection and screening of HIV patients and their vaccination is not recommended.

Key words: Hepatitis E virus (HEV); Human Immunodeficiency Virus (HIV); anti-HEV

Frequency of *H. pylori* Infection in Dyspeptic Patients By Bacterial Antigen in Stool

Yazdanbod A, Shahbazzadegan B, Dindar oskoui A, Pourmohammadjan N, Habibzadeh SH

* s.habibzadeh@arums.ac.ir

Abstract

Background and objectives: One strategy in management of patient with dyspepsia in absence of malignant or ulcer signs is *H.pylori* infection role testing, and treatment of all positive cases. Because of high prevalence of pylori infection in Ardebil, and its probable role in chronic gastritis and dyspepsia as well as recently, FDA approved *H.pylori* stool antigen test for screening of suspicious patients, this study was design to evaluate the frequency of pylori infection in dyspepsia.

Materials and methods: In this study, 100 dyspeptic patients of gastroenterology clinics of Ardebil city that had not responded to current therapies such as h2 blockers were entered study with excluding patients who taking antibiotics, proton pump inhibitors or Non Steroidal Anti inflammatory Drugs (NSAIDs) in last two weeks, and alarming danger signs such as weight loss, bleeding and melena. Stool antigen detection test for *H.pylori* were done for them.

Results: 100 patients enrolled in the study. The study group consists of 60 men and 40 women. The average age was 35 years (14-57 years).The prevalence of *H. pylori* was 72% among dyspeptic patient. Statistically significant differences were not seen between *H.pylori* infection and the sex, smoking, marriage and infection. There were no differences in clinical symptoms of dyspepsia among patients with and without *H.pylori*.

Conclusion: Among patients bothersome postprandial fullness was the most common symptom. Clinical signs were not useful in differentiate *H.pylori* infection persistence in dyspeptic patients .It seems that in hyper endemic areas for *H.pylori* such as Ardabil *H.pylori* has high association with dyspepsia, but for further explanation about its role in symptom creation , further population based studies With an emphasis on cost analysis and treatment outcome are needed .

Key words: Dyspepsia, *H.pylori* infection, stool antigen test, Ardabil

Generation Mutant Construct of pGEM-7zf:: Δ icsA (Cat^r) for Attenuation of *Shigella flexneri* 2a

Doroudian M, Saadati M, Ghahroudi A, Jahantigh D, Salehi AR, Hosseini M, Eftekhari M*

* saadati_m@yahoo.com

Abstract

Background and objective: Shigellosis causes the most contagious diseases, acute diarrheal disease in the world. The icsA gene plays a key role in pathogenesis in bacterial. The aim of this study was cloning of icsA gene and developing a mutant construct pGEM:: Δ icsA(Cat^r) in order to induction recombination in a native shigella for generation a live attenuated vaccine candidate strain.

Materials and methods: by use of biochemical tests, monoclonal Antibody and PCR the native shigella strain was examined. The entire icsA gene specific primers were designed, the Δ icsA gene was cloned in pGEM-7zf vector and the nucleotide sequence was determined. According to the data of sequencing, digestion mapping of pGEM Δ virG was obtained, after digested of Δ icsA gene by EcoRV restriction enzyme a chloramphenicol antibiotic resistance (cat^r) gene Cloned in amidst of Δ icsA gene.

Results: The native shigella strain by using biochemical tests was confirmed. Sequence of the icsA gene in native strain was sequentially identical with the strains submitted in the Gene-Bank database. Structure accuracy using specific primers pGEM:: Δ icsA(Cat^r) was confirmed.

Conclusion: Using the technique of allelic exchange based on the incident of recombination in bacteria is one of the most effective methods to develop a disruption in the target genes. This mutant construct can be applied in development of a live attenuated *Shigella flexneri*2a vaccine candidate.

Keywords: *Shigella flexneri*2a, icsA gene, Allelic exchange, live attenuated vaccine

Microbial Contamination of Operating Rooms Equipments in Selected Hospitals in Kermanshah

Jalalvandi F, Teimouri B, Sohrabi N, Fakhri M, Shahsavari S, Jafari S*

*na.sohrabi@yahoo.com

Abstract

Background and objective: Nosocomial infections are one of the causes of mortality in hospitalized patients. Environment, staffs and equipments are the major sources of these infections. Contamination of equipments is could be contributed in nosocomial infections especially surgical-site infections. The purpose of this study was to determination of microbial contamination of operating rooms equipments in selected hospitals in Kermanshah.

Materials and methods: In this cross-sectional study 180 swab samples were collected from selected equipments in each hospital. These swabs were inoculated onto blood and Eosin methylene blue agars and identification of microbial agents were done using standard biochemical microbiological methods. All Data analyzed using SPSS software.

Results: The results showed 73 cases (40.5%) were contaminated. The contamination rate in mobile and immobile equipments was 63% and 37%, respectively. The most infected equipments were suction (28.8%). Coagulase negative staphylococci (72.6%) were the most frequent isolates in this study. The most contaminated operating rooms were general surgery unit (26%) and ENT unit (16.4%), respectively.

Conclusion: This study showed a high percentage of contamination of equipments in operating rooms. Applying prevention standard guidelines is necessary to reduce the rate of this contamination in operating rooms in these hospitals.

Key words: Nosocomial infections, Microbial contamination, Operating room