

Review article

Leishmaniasis in Southwest Asian and African and prevention, treatment Methods

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Abstract

Background and objective: Cutaneous and visceral forms of leishmaniasis are the most important protozoan infection in the Southwest Asian and Africa. The disease is currently a major public health problem and an impediment to development worldwide, especially in tropical and subtropical countries, resulting in social, economic, mental and health impacts. Much data is still missing concerning the risk factors of the infection and the lesion development, as well as vector and reservoir ecology and behavior. The knowledge of such parameters, following multidisciplinary and integrated approaches, is crucial for better management and control of the disease, that also faces a lack of resources and efficient control measures. In this study, has been pointed to the importance of familiarity of health personnel with the methods of prevention, diagnosis and treatment of cutaneous leishmaniasis in Iran and a number of southwest Asian and African countries.

Materials and methods: This study conducted as a literature review. More than 170 articles selected by searching scientific sources with published dates of 1990 to 2019 using key words such as cutaneous leishmaniasis, diagnosis and control, vector, reservoir, epidemiology, middle-east and military areas from the available databases such as Science Direct, Google Scholar, PubMed, Iran Medex, Scopus, SID, Magiran. Then, unrelated articles were deleted and the necessary information was extracted by studying more than 107 articles and textbooks for parasitology.

Results: There are four cycles of transmission of leishmaniasis: zoonotic cutaneous leishmaniasis, (ZCL) induce by *Leishmania (L.) major*, Zoonotic visceral leishmaniasis (ZVL) is inducing by *L. infantum*, Anthroponotic cutaneous leishmaniasis (ACL), induce by *L. tropica* and Anthroponotic visceral leishmaniasis (AVL) induces by *L. donovani* in humans. Things like poverty, high human migration, regional political upheavals and recent wars and crises, and poor health and livelihoods have led to widespread leishmaniasis spread around the world, including in Southwest and African countries. These conditions have seriously endangered the health of the people of those countries and the travelers and migrants to these areas.

Conclusion: There are many challenges facing the successful control of leishmaniasis. Considering the increasing rate of leishmaniasis in recent years in different parts of the country and a number of countries around the world, that is necessary for the health authorities of the country and military forces stationed in border areas to have adequate and constructive information about clinical signs and methods of control, prevention, diagnosis and treatment and with accurate planning and necessary to prevent the spread of disease.

Key words: Leishmaniasis, Southwest Asian and African, Epidemiology, Prevention

Antimicrobial Activity of Rosemary Essential Oil and its Interaction with Common Therapeutic Antibiotics on some Gram Positive and Gram Negative Bacteria

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Abstract

Background and Objectives: Rosemary has long been regarded as one of the antimicrobial agents in traditional medicine. Today, due to the increasing resistance of microbial strains to antibiotics, numerous problems have arisen in medical and pharmaceutical sciences. This study was performed to evaluate antimicrobial activity of Rosemary essential oil (REO) on some important human pathogenic bacteria.

Materials and methods: Five pathogenic bacterial strains including *Escherichia coli*, *Pseudomonas aeruginosa* and *Salmonella typhi* as gram negative bacteria and *Staphylococcus aureus* and *Listeria innocua* as gram positive bacteria were selected. Antimicrobial activity of REO in vitro conditions on the selected pathogens was determined by disk diffusion agar, well diffusion agar, minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC). Furthermore, the interaction of REO with common therapeutic antibiotics was assessed.

Results: The results showed that based on disc diffusion agar method, the inhibition zone diameter of REO for *Staphylococcus aureus*, *Salmonella typhi*, *Listeria innocua*, *Escherichia coli* and *Pseudomonas aeruginosa* were 14.60, 10.30, 12.50, 12.10 and 12.20 mm, respectively. A synergistic effect was revealed in combination of REO and chloramphenicol antibiotic against *Salmonella typhi*, *Listeria innocua*, and *Pseudomonas aeruginosa*, while this impact has been shown to be antagonistic for *Escherichia coli* and *Staphylococcus aureus*. Furthermore, synergistic interactions between REO and gentamicin antibiotic were found for all tested strains and the MIC for *Staphylococcus aureus*, *Salmonella typhi*, *Listeria innocua*, *Escherichia coli* and *Pseudomonas aeruginosa* were determined as 20.10, 18.60, 20.20, 18.00 and 19.10 mm, respectively. The minimum inhibitory concentration of REO for all tested bacteria in this study was 12.50 mg/ml.

Conclusion: Based on results of this study, it was found that REO has an acceptable antibacterial activity against the examined pathogenic strains. Therefore, REO may be used as a natural preservative in food products to control the growth of pathogenic microorganisms.

Keywords: Rosemary essential oil, Antimicrobial effect, Gram positive and negative bacteria, Interaction.

Economic Burden Associated with Head Louse Infestation in Qom Province, Central Iran using Activity Based Costing. 2018

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Abstract

Background and objective: Head lice are obligatory human and animal ectoparasites that are considered one of the most important health problems around the world. The aim of this study was to estimate the economic burden associated with head louse infestation in Qom province using Activity Based Costing.

Materials and methods: In a cross-sectional census study, all schoolchildren in census form Qom province were investigated for head lice infestations in the year 2018. Also, all individuals who had complained of head lice infestation were examined and the confirmed cases were entered to the study for evaluating of economic burden of head lice. The two financial soft wares (Azarakhsh and Roozamad) in Excel were used to costs analysis of government expenditures (direct and indirect costs) and out of pocket costs.

Results: Economic burden of head lice infestation was estimated 14,985,409,572 rials (299,709\$). The direct and indirect costs; governmental cost, out of pocket and total costs (governmental +out of pocket) of head lice infestation were included 157,337 rials (3.14\$), 141,675 rials (2.84\$), 299,012 rials (5.98\$), 280,000 rials (5.60\$) and 579,012 rials (11.58\$) per case respectively.

Conclusions: Head lice infestation impose high costs on government healthcare systems, and in particular on households. Therefore, it is recommended that, while prioritizing lice-prevention programs, a larger share of the health care costs to pay by the government healthcare systems. It makes the out-of-pocket payments will be minimized.

Keywords: Economic Burden, Head Louse Infestation, Iran

Typing of Methicillin Resistant *Staphylococcus aureus* Strains Isolated from Patients with Urinary Tract Infection in Isfahan during 2017

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Abstract

Background and objective: Methicillin resistant *Staphylococcus aureus* (MRSA) has long been a common pathogen in healthcare facilities, but now, it has emerged as a problematic pathogen in the community setting as well. In this study we aimed to type all MRSA strains isolated from patients with urinary tract infection (UTI) in a hospital in Isfahan.

Materials and methods: A total of 109 *S. aureus* isolates were collected from patients with UTI from a hospital in Isfahan, during 2016 and were identified at the species level using specific primers. All strains were tested for susceptibility to ceftazidime and the presence of *mecA* gene was evaluated among MRSA strains. Separate multiplex-PCR assays were employed for SCC*mec* typing, *ccr* typing and *agr* typing of strains.

Results: Out of the 109 isolates which confirmed as *S. aureus* strains, 36 strains showed resistance to ceftazidime and harbored *mecA* gene. The results of SCC*mec* and *ccr* typing of MRSA strains showed the presence of SCC*mec* types III, IV and V and also types 2, 3 and 5 *ccr*, in which SCC*mec* type III and *ccr* type 3 were the dominant types among all. Moreover, MRSA strains were positive for *agr* types I-IV in which *agr* type I was the most frequent one.

Conclusion: The results of this study indicating the presence of hospital acquired MRSA (HA-MRSA) strains among patients with UTI in the desired hospital. Strains with hospital origin usually show high resistance to different antibiotics and also have a variety of virulence factors which enable them to produce wide range of infections. The prevalence of such strains in the desired hospital could be an urgent for patient safety.

Keywords: MRSA, UTI, typing, SCC*mec*, *ccr*, *agr*

Effect of Leech (*Hirudo medicinalis*) Saliva on *Staphylococcus aureus* and *Escherichia coli*, *in vitro*

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Abstract

Background and objective: In order to increase in microbial resistance, finding biological antimicrobial materials is valuable. Therefore, in this research, antimicrobial effect of leech saliva on the growth of two bacteria, *Staphylococcus aureus* (Gram positive) and *Escherichia coli* (Gram negative) was studied.

Materials and methods: The leech saliva was extracted *in vitro* and cultured in different dilutions with BHI broth and 1×10^8 *S.aureus* and *E.coli* bacteria in sterile microplate. The results were observed and interpreted after 24 and 48 hour incubation at 490 nm wave length. All experiment procedures were repeated 2 weeks later.

Results: After 24 hour, in *S.aureus* culture significant difference was observed among all wells with positive control, in *E.coli* was just among 1-7 wells ($P < 0.05$). After 48 hour, again significant difference was observed among all wells of *S.aureus* with positive control but in *E.coli* was just in well number 1 (The highest concentration of leech saliva).

Conclusion: According to the results, leech saliva has antimicrobial effect and more studies on animal models are necessary.

Key words: Leech saliva, Leech therapy, *Staphylococcus aureus*, *Escherichia coli*

Microbial Contamination of Fresh and Cut Vegetables Ready for Consumption. Yazd, summer 1398

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Abstract

Background and objective: Vegetables are one of the main sources of vitamins, minerals and other nutrients in the diet. Considering the increasing popularity of consumers for ready-to-eat and packaged vegetables, therefore, the examination of their microbial quality in terms of indicator bacteria the great importance in the development of gastrointestinal diseases. The aim of this study was to determine the microbial contamination in fresh and cut vegetables for use in Yazd workshops.

Materials and methods: In this study, 79 samples including packaged vegetables (Ash, Stewed, eating and Coco Vegetable) were evaluated for microbial contamination according to the methods provided in Iranian National Standard No. 10080.

Results: The results showed that 86% of the samples were contaminated with *Escherichia coli*, 90% with coliform, 22% with Enterococcus and 15% with mold above standard limit.

Conclusion: Due to the high percentage of contamination in ready-to-eat vegetables, there is a possibility of contamination at all stages from washing to crushing and packaging, which may decrease the shelf life of the products and endanger consumer health. Therefore, it is essential to be careful in the initial washing and disinfection of vegetables, staff health, environmental health and vegetable processing equipment, as well as inspection and supervision by health centers.

Keywords: Vegetables, Microbial contamination, *Escherichia coli*, Enterococcus

Comparison of Virulence Genes (*int*, *inv*, *spv* (*vir*)) in *Salmonella typhimurium* and *infantis* from Clinical Cases by Multiplex PCR

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Abstract

Background and objective: virulence genes in *Salmonella* are a combination of plasmid and chromosomal factors and a single genetic position would not be responsible for all biological manifestations in *Salmonella*. Considering the difference in the serotypes of *Salmonella* in terms of serious genes, the aim of this study was to compare the presence of plasmid and chromosomal virulence genes (*int*, *inv*, *spv* (*vir*)) *Salmonella typhimurium* and *Infantis* in clinical cases in children and adults by Multiplex PCR.

Materials and methods: In this study, 676 stool specimens were collected from patients referring to Imam Khomeini and Milad hospitals and 60 isolates were identified as *Salmonella*. After serotyping, 30 isolates were recognized as *Salmonella infants* and 30 isolates as *salmonella typhimurium*. By using the Multiplex PCR technique, the prevalence of *spvC*, *invA* and *Int* genes was studied.

Results: All investigated serotypes had *invA* and *Int* genes. 93.3% of *typhimurium* serotypes and 6/7% of *infantis* serotypes infants had *SpvC* gene. In 93/3% of *typhimurium* serotypes and 6/7% of *infantis* serotypes all three genes were present simultaneously.

Conclusion: virulence genes increase the pathogenicity of *typhimurium* and *Infantis* strains. Therefore, the genetic and molecular genetic isolation of these genes can help to identify the bacterial enzymes and to make effective drugs for the treatment of related diseases.

Keywords: *Salmonella typhimurium*, *Salmonella infections*, Multiplex PCR, *int,inv,spv* genes.