



Isolation and genes study of MRS (Staphylococcus aureus) from Nasal swab samples taken from restaurant and food stores workers in mayssan province/ Iraq

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INTRODUCTION

Antibiotic resistance is type of drug resistance where a microorganism is able to survive exposure to an antibiotic. Genes can be transferred between bacteria a horizontal fashion by conjugation, transduction, transformation. Thus a gene for antibiotic resistance which had evolved via natural selection may be shared. Evolutionary stress such as exposure to antibiotics then selects for the antibiotic resistant trait. Many antibiotic resistance genes reside on plasmids, facilitating their transfer. If a bacterium carries several resistance genes, it is called multi resistant or, informally, a superbug or super bacterium. The primary cause of antibiotic resistance is genetic mutation in bacteria. The prevalence of antibiotic resistant bacteria is a result of antibiotic use both within medicine and veterinary medicine. The greater the duration of exposure is the greater the risk of the development of resistance irrespective of the severity of the need for antibiotics. As resistance becomes more common there becomes a greater need for alternative treatments. However despite a push for new antibiotic therapies there has been a continued decline in the number of newly approved drugs. Antibiotic resistance therefore poses a significant problem. The widespread use of antibiotics both inside and outside of medicine is playing a significant role in the emergence of resistant bacteria. Antibiotics are often used in rearing animals for food and this use among others leads to the creation of resistant strains of bacteria so we see now different type of resistance like MDR(multidrug resistant bacteria) and XDR (extensively drug resistant bacteria) and PDR (Pan drug resistant bacteria) .from the widely use of antibiotics through the communities.

Abstract

In the present study *Staphylococcus aureus* was isolated from Nasal swab taken from restaurant and food stores workers during the period from January to June 2020. We made the antibiotic sensitivity test and coagulase test and mannitol salt agar test. Sensitivity test showed resistance to the three antibiotics which two are penicillin, methicillin, and the third was vancomycin and gave a positive result to the coagulase test and mannitol salt agar and hemolysis on blood agar. PCR analysis for these bacteria showed that the gene *mecA* are present in MRS *Staphylococcus aureus* while the other *Staphylococcus aureus* has not shown resistance to the same antibiotic. Lost this gene the result of gel electrophoresis for these resistance bacteria shows the *mecA* gene which has the same length which is 986bp while the other *Staph aureus* which not resistance lost this *mecA* gene and shown sensitivity to the all antibiotics used in this study. And I detected the ratio of *Staphylococcus aureus* from the total numbers of *Staphylococcus* spp and also I detected the ratio of MRS (methicillin resistance *Staphylococcus aureus*) and VRS *Staphylococcus aureus* from the total numbers of *Staphylococcus aureus* which isolated by this study. And I made gene study for MRS bacteria only by PCR technique to detect the *mecA* gene in this bacteria.

Discussion

In this research I took samples of Nasal swab from restaurant and food stores workers in Maysan province |Iraq to make study about the presence of *Staphylococcus aureus* in these samples which cause food poisoning by secret exotoxin TSST-1 and diagnosis the ratio of resistance bacteria in these samples. I collected 2069 samples during the period from 1 January to 30 June 2020. I isolated about 61 sample of *Staphylococcus aureus* from these samples and I diagnosis about seven samples were resistance. Four of these samples were resistance to five antibiotics and sensitive to the two antibiotics and two samples resistance to three antibiotics and sensitive to the four antibiotics and one sample was resistance for all antibiotics PDR (pan drug resistant). The gene study of these samples for MRS only shows presence of plasmid in these bacteria which carry the *MecA* gene which responsible for resistance phenomena. While the other *Staph aureus* which doesn't have plasmid didn't show resistant to antibiotics. The MRS *Staphylococcus aureus* has plasmid with same molecular weight which is 986 bp and these bacteria showed high resistance to the Methicillin and glycopeptides antibiotics vancomycin and showed different type of sensitivity to other antibiotics which used in this study.

Conclusion:

this study pointed out that the numbers of isolated staphylococcus aureus from the total samples were few numbers which were 61 samples from 2069 in percentage 2.9% while the numbers of MRS staphylococcus aureus were 7 samples from 61 samples of staphylococcus aureus in percentage 11.4% and this numbers indicate worrying ratio so I recommended to deal in cautiously with these isolated samples by sterilize these samples in autoclave to prevent spread this resistance bacteria in the environment which cause many disease to human and cause also effective infection for animals like mastitis in cows and also I recommended the use of antibiotic must be under the supervisions of the doctors and also the doctors must be reduce prescribe of the antibiotic to the patients which consider one of the reasons of incidence the resistance phenomena in many bacteria.

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