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Comparison between *Staphylococcus aureus* of animals origin and that of human origin

A thesis presented by

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Abstract

The main objective of the present study was to compare between *Staphylococcus aureus* isolated from animal and human origin, where phenotypic, virulence and genotypic analysis were investigated. A total number of 165 samples was collected from clinical mastitic cows' and sheep's, pus from abscesses and septic wounds of infected animals, also, blood, pus swabs from abscesses and septic wounds and sputum where collected from diseased human admitted to clinics of Assiut Governorate, Egypt. The results revealed that, incidence of *S. aureus* isolated from positive *Staphylococcus* spp. among the examined animal samples, where clinical mastitic cows', clinical mastitic sheep's and pus samples of examined animals were 8.33%, 100% and 20%, respectively, while from blood, pus and sputum of human cases were 16.67%, 53.49% and 75%, respectively. Also, the prevalence of coagulase positive *S. aureus* reached 8.33%, 100% and 20%, respectively, from clinical mastitic cows', clinical mastitic sheep's and pus samples of examined animals, but from blood, pus and sputum of diseased human were 16.67%, 53.49% and 75%, respectively, using Staphaurex kits. The results of antimicrobial sensitivity test of the recovered *S. aureus* strains from animal samples explained that, most of them were highly resistant to cefoxitin and tetracycline with a percentage of 15.79% (for each) and clindamycin and erythromycin with a percentage of 10.53% (for each). However, *S. aureus* strains from human cases were resistant to cefoxitin (75%) and tetracycline (78.57%). Moreover, *S. aureus* from animal cases was sensitive to gentamicin (100%), trimethoprim+sulfamethoxazole and vancomycin (94.74% for each), but in human cases recovered *S. aureus* strains were sensitive to vancomycin (100%), ciprofloxacin (89.29%) and trimethoprim+sulfamethoxazole (82.14%). Out of 47 identified *S. aureus* strains 3(15.79%) and 21(75%), respectively, from animal and human samples proved to be methicillin resistant (MRSA). Also, 1(5.26%) of animal samples and 12(42.86%) of human samples were multi-drug resistant (MDR). Genotypic detection of *mecA* gene was carried out using specific primers at polymerase chain reaction technique (PCR). The obtained results cleared that, 6 of *S. aureus* strains from animal and human origin were positive for *mecA* gene with a percentage of 100% (for each). The main goal of the present study was the comparative similarity between *mecA* gene sequences from animal and human strains using the BLAST analysis and phylogenetic tree of DNA sequencing, where *S. aureus* represent a major serious implications on public health.

Keywords: (*S. aureus*/ clinical mastitis/ cows/ sheep/ human/ MRSA/ MDR/ PCR/ DNA sequencing).

Dedication

To My Father, Fikry

My Mother, Eman

My Brother, Bishoy

My Sister, Ereny

And to My Best Friend, Basma

And All Members Of My Family

For all The Understanding, Supports, Patience, And Sacrifices Endured During My Entire Period Of Study.

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