Detection of virulence genes and antibiotic resistance profiles of Staphylococcus aureus isolated from animals

ABSTRACT

Aims: This study was designed to determine the virulence genes and antibiotic resistance profiles of Staphylococcus aureus isolated from dogs, cats, chickens and horses.

Methodology and results: A total of 15 S. aureus isolates were used in this study. Antibiogram and screening of virulence genes was carried out using disc diffusion method and polymerase chain reaction. The results obtained showed that a total of 9 S. aureus isolates were resistant towards oxacillin (60%), 9 isolates were resistant towards neomycin (60%) and 8 isolates were resistant towards tilmicosin (53%). Resistance to amoxicillin, tetracycline and vancomycin was also observed in 6 (40%) of the isolates. Additionally, 5 (33%) of the isolates showed resistance towards streptomycin and linzolide while 4 (27%) of the isolates were resistant towards rifampin, erythromycin and mupirocin. Lastly, 3 (20%) of the isolates were resistant towards doxycycline. Intermediate resistance to amoxicillin and doxycycline was also observed. Virulence gene profiling showed that 4 (26.7%) of the isolates were positive for hl and SspA, 9 of the isolates (60%) showed positive for geh and 12 of the isolates (80%) showed positive for Set-1. Similarly, 2 (13.3%) of the isolates showed positive for etA and Seu while only 1 isolate (6.7%) showed positive for PVL and hla. None of the isolates were positive for tst-1 and etB.

Conclusion, significance and impact of study: This study revealed reduced susceptibility and multiple drug resistance (MDR) in four isolates, and susceptibility to all antibiotics in two isolates in addition to low carriage rate of virulence gene in all isolates. Thus, indicating resistance development in majority of the isolates and the need to regulate indiscriminate use of antibiotics in animals.

Keyword: Antibiotics; Polymerase chain reaction; Resistance; Staphylococcus aureus; Susceptibility; Virulence