Abstract

Sixty-eighth out of 530 different S. aureus field strains isolated from subclinical cases of bovine mastitis from Germany (n = 26), Indonesia (n = 16), Mexico (n = 16) and Brazil (n = 10), respectively, were selected to be studied in the present work. The strains were tested phenotypically as well as genotypically for the presence of penicillin G- and oxacillin-resistance. For the primary phenotypical species identification of the 530 S. aureus strains, plasmacoagulase-test and Api 32 Staph system was applied. This was confirmed by molecular detection of the S. aureus specific genes encoding 23 S rRNA, thermostable nuclease (nuc), clumping factor (clfA), coagulase (coa) and protein A region Xr (spa). The selection of the 68 strains was carried out by the random selection of one strain per herd; additionally, only strains with different macrorestriction profiles were included here. Genotypic resistance to semisynthetic penicillins (methicillin/oxacillin) and penicillin G was studied through the identification of mecA- and blaZ-genes, respectively. The mecA gene was detected in only one S. aureus isolate from Brazil, which was not phenotypically resistant against methicillin, as shown by the use of standard disc diffusion method, BBL-Chromoagar and MIC-determination by Vitek II. In contrast penicillin-resistance of strains based on the presence of the blaZ-gene could be observed in 50 (73.5%) of the investigated strains. However, only 40 (58.8%) of these 50 blaZ-positive strains were phenotypically penicillin-resistant. According to the presented data, resistance to semisynthetic penicillins in S. aureus field strains seems to be not a major problem in dairy herds of the investigated countries despite the long-term use of these antibiotics in the field.

Keywords

Staphylococcus aureus, bovine mastitis, Germany, Indonesia, Mexico, Brazil, oxacillin, penicillin G, resistance.