UNIVERSITY OF LATVIA

79th International Scientific Conference of the University of Latvia

Diversity and antimicrobial susceptibility of *Staphylococcus spp.* isolates on the facial skin of healthy volunteers

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Summary

Background. Most common bacterial colonizers of the skin, *Staphylococcus*, are often involved in a rapidly developing global health concern that is antimicrobial resistance. Antibiotic resistant microorganisms cause significant morbidity and mortality, and situation only seems to increase in magnitude as new microbial resistance mechanisms emerge.

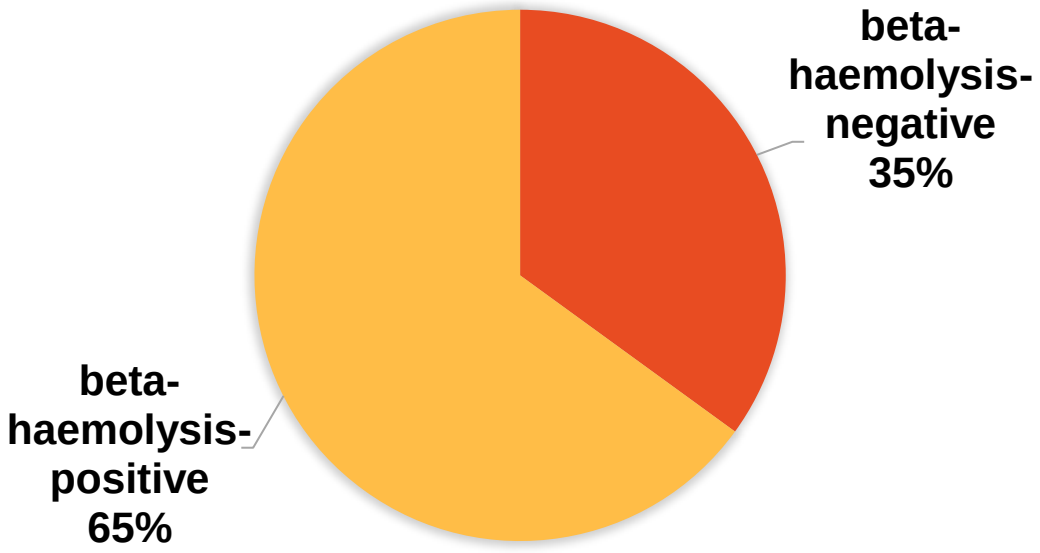
Aim. The fundamental aim of this research is to investigate healthy volunteers facial skin colonization with potentially pathogenic bacteria and to determine the susceptibility of *Staphylococcus spp.* to antibacterial agents.

Methods. Samples from skin microbiota were cultured in Tryptone soya broth. Bacterial cultures were identified using the BBL™ Crystal™ identification system and biochemical characteristics were compared. Antimicrobial susceptibility was tested by the *Bauer-Kirby* disc diffusion method**.** Etest was used for determining antimicrobial sensitivity. The following international reference strains were used as controls: *S. epidermidis* ATCC 12228 and *S. aureus* ATCC 25923.

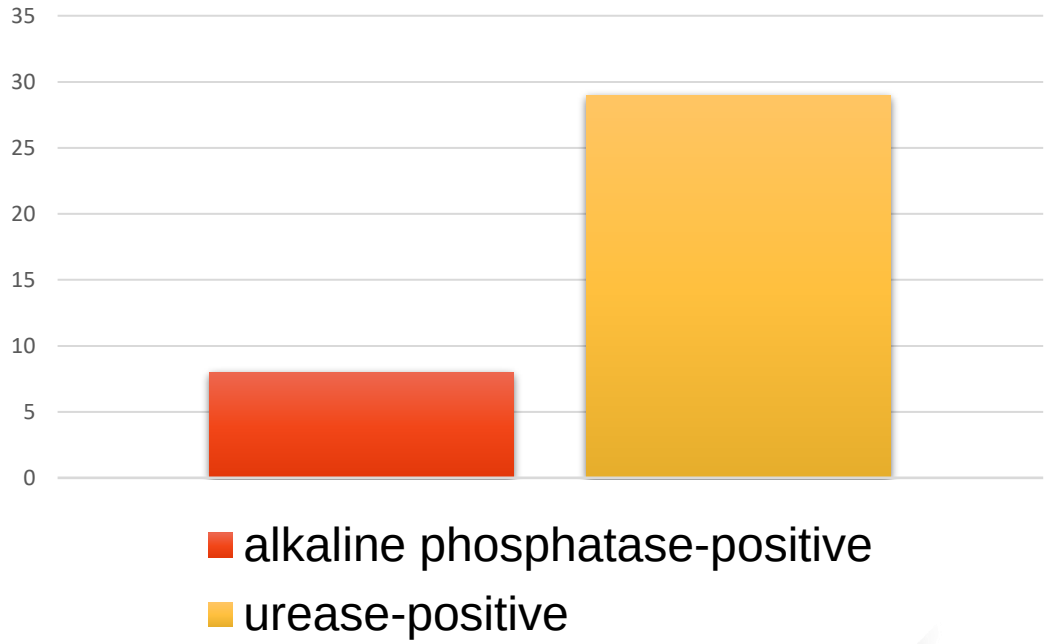
Research results

Out of all participants (n-40), *S. epidermidis* was isolated in all 40 samples, 17 (43%) *Staphylococcus aureus*, two *Enterococcus sp.,* one *Propionibacterium acnes* and one *Streptococcus sp.* were also present.

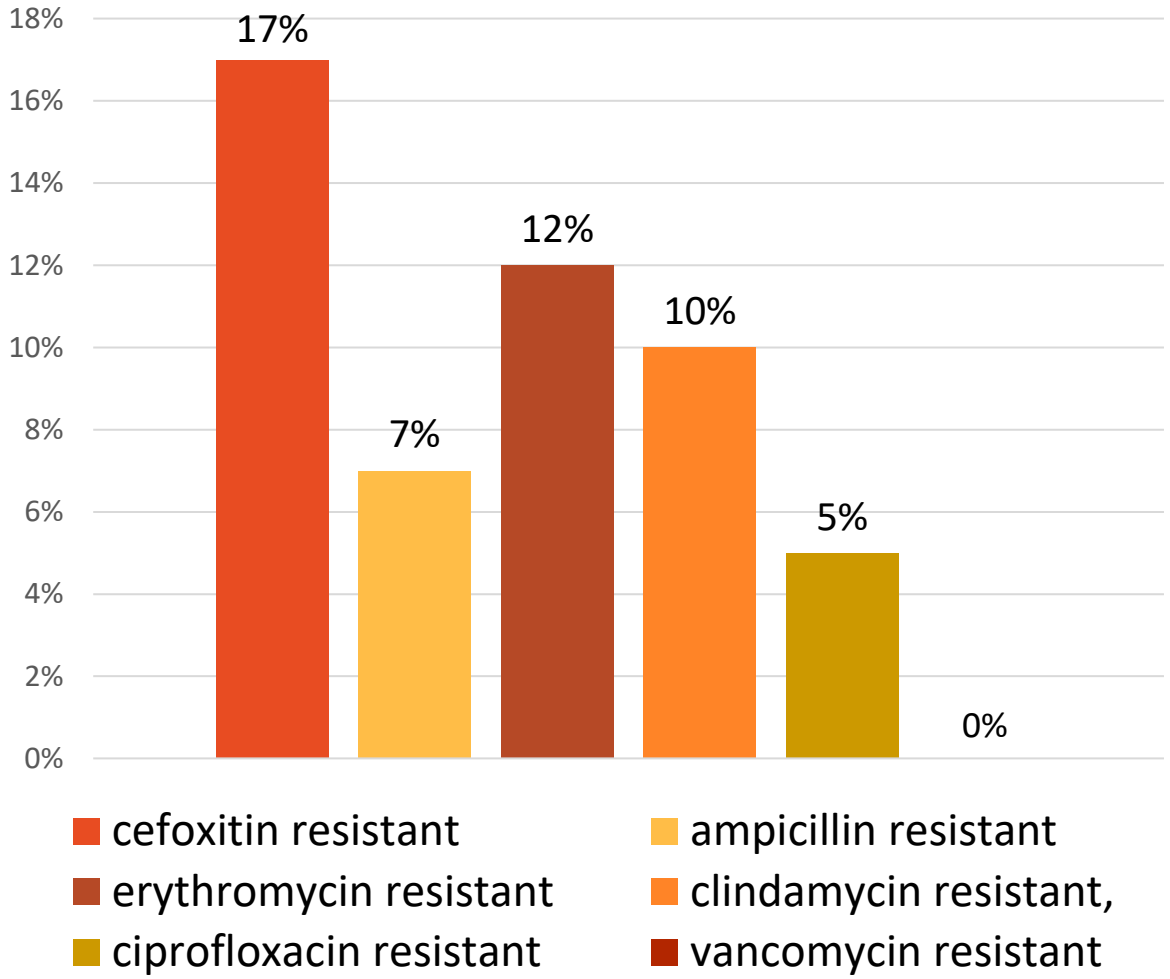
S. epidermidis isolates

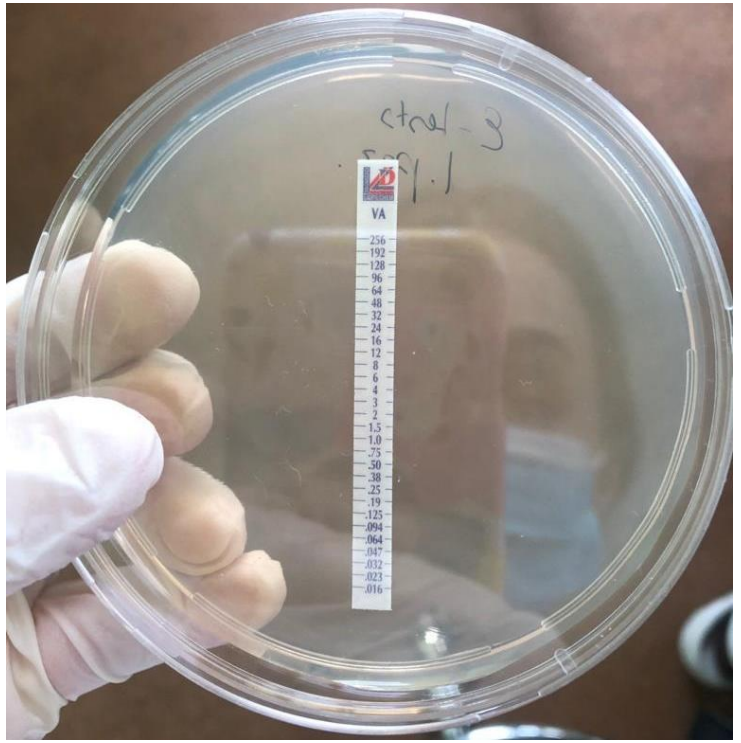


***S.epidermidis* enzyme tests**



S.epidermidis antimicrobial resistance testing





Etest

Conclusions

1. Methicillin resistance rate of *S. epidermidis* was determined to be 7 (17%) in total. Results show increase by 4.5% compared to study carried out in 2015, where 12.5% isolates of healthy volunteers were methicillin resistant.

2. The most effective antibiotic in *S. epidermidis* strains was identified as vancomycin. On the contrast, different data was collected during the 2015 study, where *S. epidermidis* strains were sensitive to all of the antibacterials.

3. Haemolytic activity was demonstrated in 26 (65%) out of total 40 *S. epidermidis* isolates, which is significantly less than in 2015 (haemolysis reaction was positive in 90% of isolates).

4. *S. epidermidis* showed urease positive reaction in total of 29 (73%) strains, only 8 (20%) strains were alkaline phosphatase positive. The percentage of urease-positive reactions decreased from 93 % (2015) to 73% and alkaline phosphatase from 48 % (2015) to 20%.