INFLUENCE OF ORAL HYGIENE IN PATIENTS WITH FIXED APPLIANCES IN THE ORAL CARRIAGE OF ESCHERICHIA COLI AND ENTEROCOCCUS ISOLATES

P. Poeta¹, H. Radhouani¹ ², G. Igrejas³, E. Martins³, C. Araújo¹ ², J. Rodrigues¹, L. Vinué⁴, M. López⁴, C. Torres⁴

¹Center of Studies of Animal and Veterinary Sciences/ Department of Veterinary Sciences, ²Center of Genetics and Biotechnology/ Department of Genetics and Biotechnology/ Institute for Biotechnology and Bioengineering, University of Trás-os-Montes and Alto Douro, Vila Real, ³Cianços, Clinic of Dental Medicine, Mirandela, Portugal, ⁴Biochemistry and Molecular Biology Area, University of La Rioja, Logroño, Spain

Background: Enterococci are saprophytic bacteria of the gastrointestinal tract of humans and animals, and occasionally can be found in other sites, such as the oral cavity. On the other hand, Escherichia coli is not frequent in the oral cavity but it was isolated in patients on cytotoxic therapy.

Objectives: To study the oral carriage of Enterococcus spp. and Escherichia coli isolates in 46 patients with fixed appliances and 55 healthy volunteers (without fixed appliances).

Methods: Oral samples were seeded in specific media for enterococcal and E. coli recovery and one isolate per sample of each type was obtained. Antimicrobial susceptibility was tested by disk diffusion method (CLSI) and the presence of genes encoding antimicrobial resistance, bacteriocins, and virulence factors was checked by PCR.

Results: No enterococci or E. coli were recovered from 55 samples of healthy volunteers. Nevertheless, ten isolates (5 E. faecium, 3 E. faecalis, and 2 E. coli) were recovered from 9 of the 46 samples of patients with fixed appliances (19.5%), and poor or non-proper oral hygiene was evidenced in all these patients. Both E. faecalis and E. coli were recovered in one patient. The percentages of antimicrobial resistance and the resistant genes detected among our enterococci were as follows: erythromycin: 100% and erm(B); kanamycin: 75% and aph(3’)-IIIa; tetracycline: 50% and tet(L) with/without tet(M); streptomycin: 37% and ant(6)-Ia; chloramphenicol: 12% and catA. One of E. coli isolates showed a phenotype of multi-resistance containing 5 resistance genes and harboured class 1 and 2 integrons. All enterococci produced gelatinase, and genes encoding enterocins L50A/B and P were detected in 4 isolates. The esp virulence gene was found in one multiresistant E. faecalis isolate.

Conclusions: Poor or non-proper oral hygiene in individuals with fixed appliances favours the oral carriage of antimicrobial-resistant E. coli and enterococci.